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### Example

Cook NR, Rosner BA, Hankinson SE, Colditz GA. Mammographic screening and risk factors for breast cancer. American Journal of Epidemiology. 2009 Dec;170(11):1422-32. doi: 10.1093/aje/kwp304.

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Conclusion should elucidate how the results communicate to the theory presented as the basis of the study and provide a concise explanation of the allegation of the findings.

## ACKNOWLEDGEMENT

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PAKISTAN JOURNAL OF HEALTH SCIENCES
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Volume 4, Issue 3 (March 2023)

# Lumpy Skin Disease in Pakistan

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The lumpy skin disease virus, also known as LSDV, belongs to the family of Poxviridae and is responsible for lumpy skin disease (LSD). It is a transboundary infection that mainly affects cattle and water buffaloes. Due to its capacity for transboundary transmission, endemic and sporadic outbreaks occur all over the globe, but particularly in Africa and Asia. The virus is primarily mechanically transmitted to susceptible hosts by hematophagous arthropods. The most efficient method to stop the spread of disease is through vaccination in conjunction with other preventative measures. There has been many reports describing these cases in Pakistan in near past and there is a chance that it will spread again [1]. In 1929, Zambia recorded the first case of LSD, which later spread to nations in Sub-Saharan Africa, South-Eastern Europe, and Asia. LSD first became known in Asia in Bangladesh, then it expanded to other countries like India, Bhutan, Nepal, Hong Kong, Vietnam, Myanmar, and Thailand. In the Pakistani province of Sindh, district Jamshoro, there was one confirmed case of LSD in 2021 November. When 36,000 infected cattle and a 0.8% mortality rate had been recorded by the end of April 2022 in Sindh, the livestock department proclaimed an epidemic of LSD. A total of five million dairy producers and meat vendors were impacted by the introduction of LSD, which had serious negative economic effects. Additionally, the virus may spread to humans through the milk and meat of sick animals [2]. The domesticated animals' ventures in industrialized countries, including Pakistan, are lingering behind as far as playing it safe against new infections with regards to epidemiological situations and financial requirements. Because of lacking indicative circumstances and viral recognizable proof inside a specific time span, the infection can spread irreversibly and increase the quantity of diseases. Pakistan has never encountered an LSD plague before, however because of endemic LSDV in its neighbors, it faces a high gamble of doing so presently. A combination of vector control, vaccination, stringent quarantine regulations, and livestock mobility restrictions may be successful in halting the spread of the illness.

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**Review Article**

# A Relative Review of Operation Theater Environment Management

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## ABSTRACT

The operation theater is a very critical area, and everything needs to be done in an ordinate manner to maintain efficacy. However, managers are needed to maintain the functionality of the OT suite. An OR manager is responsible for many things, like scheduling OT but most importantly, OT efficiency. An OR manager faces different challenges during management of an OR suite. These vary from organization to organization. The most common types of diversity found in OT are cultural diversity, religious diversity, organizational and environmental diversity, and so on. An OR manager should manage these diversities ethically and professionally to overcome an ethical dilemma. OR managers should encourage ethical behavior to improve OT efficacy and effectiveness, but change may reduce or hinder OT effectiveness due to resistance to change. Ideally, the OR manager should manage sustainability to reduce resistance to change without compromising OT efficacy or inducing socio-ethical conflicts among the OR team. For this, OR teams are managed in such a way to facilitate high-quality teamwork and promote good communication skills. However, many barriers hinder communication, which may cause misconceptions and compromise efficacy. Many tactics and strategies are used to reduce these conflicts peri-operatively and OT performance indicators are used to determine the efficiency. To increase productivity, efficiency, and effectiveness as needed while lowering personnel costs, an OR manager organizes and schedules the OT.

## INTRODUCTION

It is the environment of highly integrated sterility, surgical, and anesthetic equipment to conduct safe surgery. An area of the Health Care Department that is highly equipped with surgical and anesthetic equipment, deals with urgent or non-urgent surgical conditions of a person within a securely conducted sterile environment. An OT is a facility within a hospital where surgical operations are carried out in an aseptic environment. A specialized part of the hospital where lifesaving or life-improving procedures are done on the human body using invasive methods under strict aseptic conditions in a controlled environment by specially trained staff to promote healing and cure with the most safety, comfort, and economy." Previously, it was the area of a medical institute to study and perform surgical operations, where there was no concern for sterility and susceptibility, but now it is becoming a complex environment. However, the advancement of modern sciences has resulted in the development of a complex area of health care departments that vary in function and utilization[1, 2]Operating rooms are disinfected rooms and fully ignited, generally with overhead surgical lights, and can have viewing video display units to monitor the patient. Special air handlers like HEPA filters, clean out the air and keep a slightly elevated pressure that enables positive

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pressure inside and outside. Electricity helps with backup systems in case of a blackout, as many types of equipment are electrically powered, like monitors, cattery leads, and OT lights. Rooms are equipped with wall suction, oxygen, and possibly extraordinary anesthetic gases, so make sure to attain sterility at the time of cleaning. The Operation Theater consists of the operating table on which the patient can lie, and surgery can be carried out easily in a certain position according to surgeon preference and needs; and the anesthesia cart that is used to give anesthesia to the patient and contains other equipment like airways, anesthetic drugs, etc. Additionally, there are boxes for disposables and tables for setting up equipment [3-5]. The operating suite, a unique component of a healthcare facility, has many OT rooms. In addition to these OT rooms and their restrooms, it also has offices, dedicated hallways, and perhaps exceptional supportive units, as well as spaces for staff to change, bathe, and relax, guidance and restoration rooms, storage and cleaning facilities, and so on. In major facilities, the operating room is air-conditioned and maintained at a certain temperature. Additionally, it is maintained apart from other departments so that only authorized personnel may enter [6].

**Need of Managers**

Operating theater managers are responsible for coordinating and supervising the work of others inside the theater in order to meet hospital management objectives. The job of an OT manager isn't about personal accomplishment; it's about the success of the company and the people who work for it. The manager in charge of the company is in charge of all management tasks. OT managers oversee the efficacy, efficiency, sustainability, productivity, and cost-effectiveness of Operation Theater. The effectiveness and efficiency are intertwined [7]. A rise in the requirement for managers in medical operational sectors has led to the appointment of operation room managers. Historically, nurses were responsible for the everyday running of surgery suites. There will be a separate section on the roles and duties of an OR manager. In uncertain, diverse, and chaotic times, companies require managers' management talents and competencies more than ever before. A recent study on the performance of organizations found that it is important for managers to be able to create organizational value and morale. When it comes to managing an organization, there are four basic roles that every manager should know how to do including planning, organization objectives, organizational essentiality and control [8].

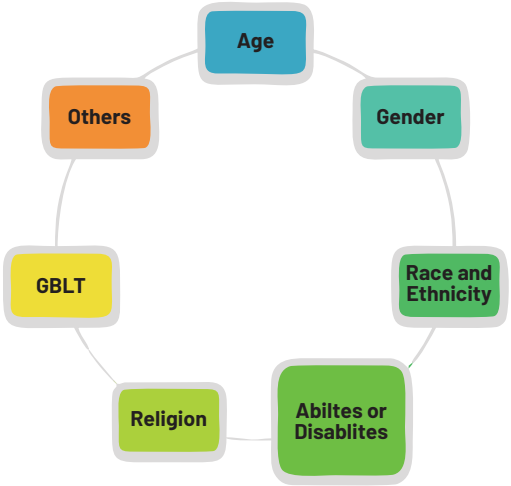
**Diversity in Management of Operation Theater**

Diversity is described as the difference between a person's or a team's functioning and effectiveness inside the operating room. In other words, they are the characteristics that distinguish or resemble individuals who operate in the operating room or other vital areas of a healthcare institution. An OR manager should examine their team members to determine the traits they share and the distinctions that set them apart. It doesn't mean that these distinctions are any less important, but rather that we, as managers, should concentrate on identifying practical ways to involve all of our employees and foster positive relationships with them in order to improve the efficiency and profitability of the business. These distinctions or variances may be superficial or profound. However, these variances do not entirely capture how individuals see, assume, think, or feel. These degrees of diversity in uniqueness and traits may influence how individuals organize presumptions and stereotypes about one another. The deepest differences are the differences in values, personality, and job choices. It may influence how individuals perceive organizational job rewards, interact with and react to leaders, negotiate, and behave at work in general. The advantages of managerial variety are shown in.

| | |
|---|---|
| People Management | Improve the effectiveness of partnership and conflict-solving activities. Capability to attract and maintain diverse employees |
| Organization Performance | Expense linked with excessive turnover, absenteeism, and litigation are reduced. Improved problem-solving abilities. System adaptability has been increased. |
| Strategic | Improves abilities and sharpens perception. enhanced innovation initiatives Encourage moral and ethical behavior; do what is "proper" |

**Table 1:** Benefits of Organization Diversity [9]

To make OT more efficient and productive than ever, an OR manager must analyze team diversity. There are many forms of workplace diversity as mentioned in figure 1 [9-12]. Age, gender, race, ethnicity, skills and impairments, religion, and GLBT are just a few of the numerous sorts of diversity that exist inside the working organization [9-17].



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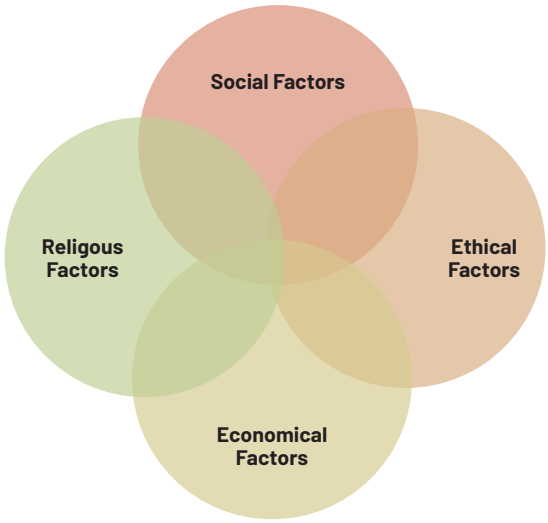


**Figure 1:** (a) Types of Workplace Diversity (b) Sustainability Factors the management [9]

### Management of Socio-Ethical Aspects

Personnel at the Operation Theater are not only socially engaged, but they also have an ethical influence on the organization's capacity to function. The first step in ensuring that a healthcare department is appropriately structured is to manage an operating room. It is the goal and purpose of social responsibility to perform safe surgery in a sterile environment while doing the right things inside the sterile environment in a manner that is socially and economically commendable. The economic efficiency of an operating suite has been shown to be positively correlated with a hospital's ability to keep its employees socially engaged. These, on the other hand, are only influenced by a small change in the organization's diversity. The difficult responsibility for an OR manager is to keep an organization running. He or she must keep the socio-ethical and religious components of the operating suite under check. They are the tactics used to achieve organizational objectives. "Ethics" are the fundamental values and beliefs of a person, whether gained professionally, ecologically, or religiously, that shape the individual's sense of what is acceptable and wrong action. In an operating room, ethics is described as a person's fundamental ideas and views that lead to proper or wrong medical legal behaviour with relation to patients or workers. shows medical ethics in health care facility.

| |
|---|
| Respect human individuality and uniqueness |
| Do no harm |
| Act with beneficence |
| Act with justice |
| Respect all assurances commended to you |
| Be devoted to the patient and others. |
| Act with rectitude |
| Respect the patient's right to choose. |

**Table 2:** Ethical Behavior in Health Care Facility [18]

A person's ethical or immoral behavior is deemed a factor. The factors are shown in .

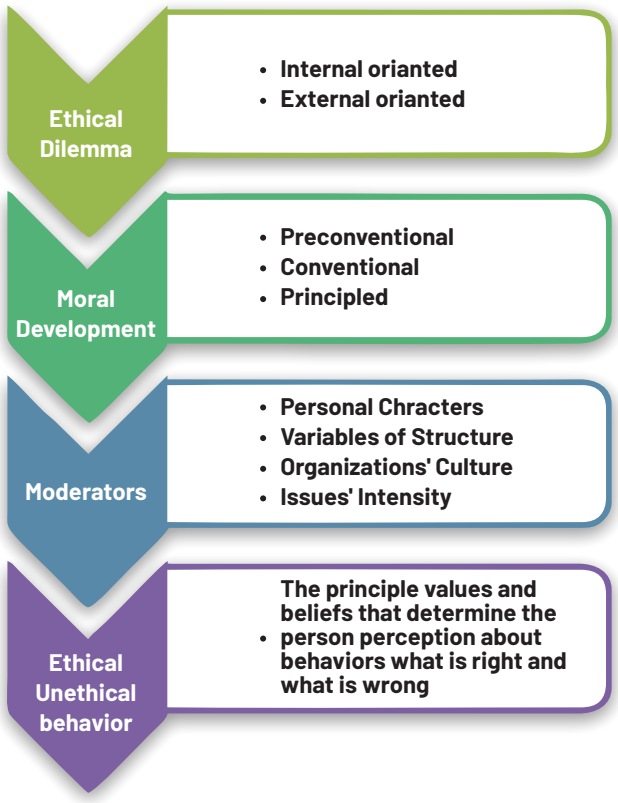


**Figure 2:** Factors of Ethical and Unethical Behavior [19]

There are six phases of moral growth or ethical behavior as seen in  that describe how a person develops ethical and immoral conduct. However, there are several moderators who oversee people's ethical conduct [19]. The  depicts the aspects that must be maintained in order to increase management sustainability.

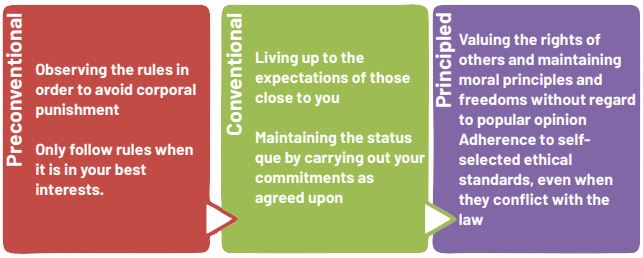


**Figure 3:** Stages of Moral Development [22]

The characteristics considerations presented in  explain why people are more likely to be impacted by the consequences of a problem if they are closely linked. And there is a high likelihood of injury owing to the concentration effect, which has instant implications.

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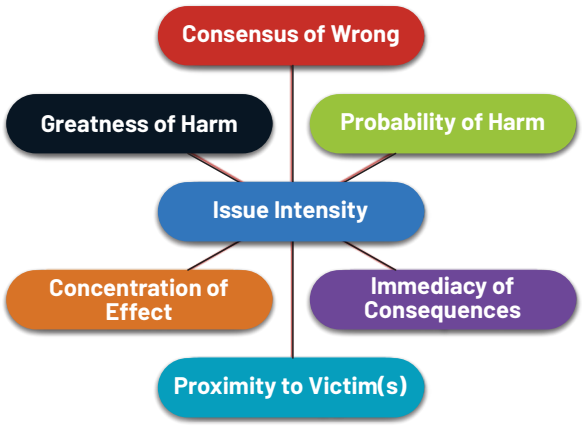


**Figure 4:** Characteristics of issue intensity [19]

Some health care dilemmas are given in . To prevent ethical issues, managers must promote ethical rules within the healthcare setting. The ethical guidelines must be observed by surgical technologists in order to reduce ethical concerns [20-22].

| |
|---|
| Right to Die |
| Stem Cell Research |
| Human Cloning |
| Abortions |
| Genetic Engineering |
| In vitro fertilization |
| Animal Experiment |
| Communicable Diseases |
| Refusal to Treatment |
| Organ Donation |
| Loyalty |
| Confidentiality |
| Spiritual Values |
| Honesty |

**Table 3:** Ethical Dilemmas in Health Care Facility [23, 24]

**Change and Management**

Change is crucial since it immediately affects the efficiency and usefulness of the working organization. A little modification may bring functionality to an absolute minimum or maximum. However, it may be either outwardly or inwardly focused. The three primary categories of change are structural, technical, and human [25-28]. Change is more powerful in organizations since it immediately affects the operation of the working organization. Hence, it must be handled. People in the workplace, on the other hand, may be resistant to change. Uncertainty, habit, personal loss, and people's beliefs are the key reasons why individuals resist change [29, 30].

**Manager and its DECISION-MAKING Capability**

The people who have the duty to manage an organization are called managers. He or she makes choices to run the workplace efficiently. A decision is the result of weighing one or more possibilities. In other words, making a choice is choosing a path of action from a variety of options. A choice is made over time in several phases [31, 32].

- Identification of the issue
- Developing choice criteria
- Criteria & weight
- Creating alternatives for the criterion
- Alternative's implementation and effectiveness assessment [33]

**Planning the Effective and Efficient OT**

- The manager has the responsibility to make OT efficient and effective. The productivity of OT can be increased but it may increase cost of the OT. A manger work in such a way to achieve organization goals it involves reducing staff cost, increase productivity, effectivity and efficiency of OT and reducing errors.
- Here are some guidelines that make OT more effective and efficient.
- Improve outcomes, reduce disputes, and encourage ethical conduct by understanding culture and managing diversity in the operating room.
- Utilizing the efficient decision-making process to achieve medically and economically beneficial results for the firm and its employees.
- Build an organizational environment that can spot unanticipated results and bias and quickly adjust results to a new situation.
- Managing competence in the surgical field as it may improve patient and employee safety. As it promotes shared accountability in the surgical setting, encouraging collaborative leadership inside the operating room.
- Improving the efficiency of organizational designs to get working staff to take part more willingly and effectively.
- Encourage interdisciplinary teamwork in the operating room so that patients get the best treatment. Motivate and encourage your staff so they can do a better job in the operating room.
- Facilitate professional communication that encourages openness, trust, and mutual understanding.
- Educate personnel to enhance professionalism.
- Encourage ethical conduct inside the company.
- Create a "Floor Coordinator" role to serve as the primary point of contact for OT coordination on a daily basis.
- Make sure you have adequate people to help with the changeover of surgical procedures. Make a roster to

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examine the activity pattern of the organization.
- Create an operating room session template that enhances patient flow during and after surgery.
- List plans for anesthetic preparation sessions and the theater
- Manage the equipment in order to cut down on negligent behaviors and OT costs.
- Prioritize the patient based on the need to enhance operating room efficiency.
- Manage and use data as a prediction instrument to evaluate the effectiveness of Operation Theater.
- Scheduling should be designed to minimize bias errors. Lowering surgical start-up and cumulative lateness[34].
- Encourage the patient to take part in the surgery and make sure the patient has access to documents based on certain criteria.
- Aid and coordinate the OT services and OT management committees.
- Managing surgical and non-surgical requests in OT from other surgical departments[35].
- Establish and maintain document guidelines.
- Manage patient flow systems for variation management in the operating room.
- Effectively managing the architecture of the operating room to improve functionality[8, 35].

**Team Management in OT**

A team is a collection of individuals who collaborate to achieve organizational objectives. A group is made up of two or more interdependent people who collaborate and interact to accomplish common objectives. However, groups might be formal (formed by organizations to pursue organizational objectives) or informal (formed by individuals). Formal groups include, for instance, command groups, task groups, cross-functional groups, and self-managed groups. Within the organization, group formation occurs in five phases[6].

**Qualities of Effective Teams**

An outcome of the high quality of relationships between group members is effective collaboration. Nevertheless, disagreements are common within a team due to the variety of people's behaviors and views. There are several characteristics that constitute an efficient team[23].

- Clear objectives
- Relevant skills
- Mutual trust
- Unified commitment
- Good communication
- Negotiation skills
- Appropriate leadership
- Internal and External Support.
- Yielding
- Change

**Team Managing**

Surgical technologists are increasingly taking on leadership responsibilities[23].

A competent team leader will adhere to the following guidelines:

- Be respectful and attentive to all of your coworkers.
- Create attainable objectives.
- Ensure that everyone on the team understands and cares about the mission.
- Keep an eye out for signs of discord among your coworkers.
- Interactions within the team should be free of emotion.
- Make sure that everyone in the team has the opportunity to contribute ideas and opinions.
- There are several methods for bringing in new ideas, so be open to incorporating them into your goals.
- Team members should have the freedom to make errors and be human.
- Remind team members to constantly express their appreciation and to highlight their achievements.
- Meetings should be succinct, well-structured, and laser-focused in their objectives.
- When speaking, allow other people to talk more often than you.
- Don't be a part of the department politics and don't criticize the management.
- Share your wisdom freely while being modest about your judgments[23].

## CONCLUSIONS

Safe surgery requires integrated sterility, surgical, and anesthetic equipment. Operating rooms are cleaned, highly lit, and might contain video monitors to watch patients. Operating theater managers are responsible for coordinating and supervising the work of others inside the theater. Their primary responsibility is to identify key challenges and formulate solutions. OT managers oversee the efficacy, efficiency, sustainability, productivity, and cost-effectiveness of Operation Theater. A little modification may bring functionality to an absolute minimum or maximum. The manager has the responsibility of making OT efficient and effective. Managers must adjust to existing OR space or spot weaknesses in new facilities. Operation Theater should examine efficiency and productivity using measurements that best reflect their environment. Balanced scorecards or dashboards

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measure service activity, efficiency, productivity, safety, treatment effects, and finances. These criteria should be known by OTs and hospital administration.

## Conflicts of Interest

The authors declare no conflict of interest.

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Review Article

# Phenomenology Qualitative Research Inquiry: A Review Paper

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## ABSTRACT

Phenomenology is the qualitative research inquiry that explores the lived experiences of the individual. This paper discusses phenomenology as a qualitative research methodology and its roots, characteristics, and steps to conduct the study. The relevant literature was searched using the database library, including PubMed, Google Scholar, PakMediNet, Medline, and Cumulative Index to Nursing and Allied Health Literature CINAHL. Literature was searched using keywords including phenomenology, qualitative inquiry, roots of phenomenology, steps of phenomenology, and characters of phenomenology. The essential essence of phenomenology is to understand the lived experiences of individuals. The participants truly share the lived experiences which they witnessed. It is concluded that phenomenology is a qualitative inquiry that addresses the real-life experiences of individuals.

## INTRODUCTION

Phenomenology is the method of inquiry of interpretive paradigm. It is also best known as the science of the essence of consciousness and perception, which describes the idea and meaning of the lived experience of individuals [1]. Moreover, the core element of phenomenology is to understand phenomena like caring, healing, and wholeness as witnessed by a specific person who has lived through that event. Phenomenology is the inquiry method that deals with human experience in which individuals perceive them as appearing to consciousness. Individuals share their lived experiences robustly when they go through that phenomenon [2]. According to Merleau-Ponty, phenomenology is best related to essence; the essence comprises not only perception but also unsoundness. In contrast, it is termed philosophy, which places essence into being. Renowned philosopher Immanuel Kant in 1764, exhibited that phenomenology is the study of any event. Philosophy acts as a movement despite a set of doctrines described by Herbert Spiegelberg in 1975 [3]. Wagner, in 1983 explained that phenomenology is defined as philosophy and method, an approach to thinking and looking at yourself, others, and everything. Lived experiences are the prime focus of phenomenology. Additionally, lived experiences are most

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appropriate for the real-life experiences of the individuals stated by Schutz in 1970. Merleau-Ponty, in 1956 specified that the prime objective of phenomenology is to explain the lived experience [4, 5].

## METHODS

The relevant literature was searched using databases like PubMed, Google Scholar, PakMediNet, Medline, and Cumulative Index to Nursing and Allied Health Literature CINAHL. Literature was searched using keywords including phenomenology, qualitative inquiry, roots of phenomenology, steps of phenomenology, and characters of phenomenology.

### Phenomenological Roots

The phenomenological viewpoint emerged primarily in the first decade of the 20th century. This initial period comprises three phases: Preparatory, German, and French [6].

### Preparatory Phase

The eminent philosophers of this period were Franz Brentano and Carl Stumpf. Stumpf described phenomenology as scientific inquiry. The idea of intentionality was seen in the work of Spiegelberg as the prime focus, and it was extensively elaborated. According to Merleau-Ponty, internal perception is meaningless without external perception.

### German Phase

The esteemed philosophers of this era were Edmund Husserl and Martin Heidegger. Husserl explained that it is a scientific inquiry that provides an in-depth understanding of human beings. It further indicated that phenomenology is the basis of all philosophy and science. The ideas of essences, intuiting, and phenomenological reduction were formulated in this era. Hence, essences offer a tremendously true and common understanding of the event. It is well said that extensive interpretation is vigorously obtained by intuiting. The researcher perceives as imagine to the phenomena to differ from the data unless some understanding develops.

### Phenomenological reduction

It gives a return to genuine knowledge about an event that has been investigated. Husserl nicely explained that individuals go back to themselves to get real and original knowledge. When there is doubt about beliefs or assumptions related to an event under examination that can lead to the start of phenomenological reduction, Merleau-Ponty characterized that whole reduction as not truly possible due to cordial association with the world. Concerning this reduction process, firstly, the researcher has to categorize the preoccupied concepts related to the event under study. Bracketing is increasingly important for the researcher to remain neutral in either belief or disbelief of being of an event. For the achievement of descriptions genuinely, bracketing will remain persistent and continuing.

### French Phase

In the 3rd phase, the leading philosophers were Gabriel Marcel, Jean-Paul Sartre, and Merleau-Ponty. The main idea constructed in this era was the embodiment and existence of the world as well. The ideas linked to belief describe how all performances are developed based on a perception of real knowledge about an event. The embodiment describes as consciousness which is knowledge of the existence of the world in which an individual lives.

### Fundamental characteristics of the phenomenological method

Phenomenology is a rigorous, systematic, and critical analysis of an event. The prime purpose of this method is to explain the structure of the lived experience of an event. This methodological inquiry starts from phenomena of interest, and they aim to understand the subjective meaning of the lived experience of an event. The method is utterly based on the interpretive domain [7]. It primarily focuses on individual experiences through in-depth interviews, inductive analysis, and reflexivity. In phenomenology, the researcher chiefly specifies their ideas and preconceptions related to an event under investigation and consideration of particular perceptions linked to the interpretation of facts [8]. The philosophical questions have tremendous meaning that begins with what and how. It always undertakes questions about the true nature of lived experience. The reduction has been recognized as an essential technique in phenomenology. Van Manen exhibited that a real understanding of an event is only possible when done practically [9]. Colaizzi undertakes in 1978 that phenomena of interest should be described initially after that, gather the descriptions, read the descriptions extensively, go back to the novel transcript, and develop comprehensive explanations. Streubert posed in 1991 that bracketing the researcher's suppositions is increasingly important. It poses the true understanding of lived experiences of the individuals and is especially linked with incredibly important characteristics of lived experience [10]. The concept of transcendental reduction has been reported in the inquiry. The present methodology mainly undertakes the discovery and analysis of individuals residing there. It predominantly comprises deeper conservations.

### Six core steps of phenomenology

The prominent philosopher Spiegel Berg has comprehensively stated the six fundamental essentials. Descriptive phenomenology primarily focuses on analyzing, exploring, and describing the phenomena under

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investigation. Moreover, it broadly and extensively poses those experiences. Spiegelberg explained it has three steps such as intuiting, analyzing and describing. Intuitive requires being involved in the phenomena [6]. Intuitive is defined as using the basis of feeling to be factual, even without conscious logic. In the intuitive step, the researcher plays a key role as an instrument in the interviewing method. The researcher has to act as a tool to gather data and listen to descriptions of the quality of life by interview procedure. Analyzing this step, more importantly, deals with identifying the essence of the event, which is under study and encompasses how data is gathered and presented.

**Describing**

In 3rd step, the written and verbal description has been made clear. It is especially dependent on the arrangement and grouping of an event. Concerning the quality of life, phenomenology explains all the categorizing critical components. Phenomenology of the essence pertains to searching the data in terms of themes and developing the relationship by precise phenomena [11].

**Phenomenology of appearances**

It poses the attention as the event looks. It generally emphasizes the attention of the phenomena as it discloses by dwelling with facts.

**Constitutive Phenomenology**

It studies phenomena as they are founded in our consciousness. This notion formulates a sense of animated adventure regarding a relationship with the world [12].

**Reductive phenomenology**

The researcher also constantly speaks about the biases, expectations, and preoccupations. It is vital to preserve objectivity considered equally critical in this step. For the achievement of genuine reduction, the phenomenological reduction is critical [13].

**Phenomenological Hermeneutic philosophy**

This philosophical approach provides the nature of understating for a specific event: Furthermore, this methodology permits incredibly sensitive knowledge about a human being. This philosophy describes an interpretation of the phenomena. Gadamer explains that it fills the gap between the familiar and unfamiliar linked to our worlds[14]

**The rationale for choosing phenomenology as a method**

Nursing is a noble profession that renders a holistic approach to care delivery. Nursing certainly encourages caring for a human being, deeply emerging holistically. Not only holistic care but also avoidance of reductionism is a key component of nursing practice being a professional. Nurses are frontline workers of any health care delivery system. Nurses experience a variety of lived experiences. To explore lived experiences of nurses and patients, phenomenology is a robust study because lived experiences and perceptions cannot be quantified for the above reason.

**Researcher role**

The researcher takes accountability in transforming the data, as lived experiences are essential to describe a specific event**.** Firstly, transformation happens as individual experiences are converted into language. The second transformation happens as the investigator converts, which is seen and heard in real experience. Thirdly, the investigator transforms understating the event under study into abstract classes that can lead to the essence of real experience. In the 4th step, the investigator converts those essences into written format. In the fifth step, the written file has been changed into an understanding that could simplify the previous steps.

**Data generation**

The purposive sampling method is normally utilized in this inquiry method. Participants have been approached for the study having certain knowledge about the phenomena. The investigator gets access to the participant when they voluntarily consent to participate. Before conducting the interview, the participants should be prepared for an actual meeting. In the initial interview, the investigator should get informed consent and permission for tape recording. Open-ended will be used to help this process. When a participant feels tired of descriptions, an interview must be ended. Data generation will remain to continue till saturation has been accomplished. Ethical consideration: Informed consent should be obtained before tape recording. The privacy of participants must be guaranteed. While disseminating the data in the manuscript, do not show the participant's identity.

**Data treatment**

Several ways are used to cater to the treatment data, including the open-ended interviewing method, tape recording, and verbatim transcription is effective in increasing the data collection accuracy. The robust and high-quality tape recorder is increasingly essential for recording. It is equally essential for the researcher to make handwritten notes. To add some more description, a second interview may be carried out. In case of tape recorder fails, the researcher may write hand notes which avoids any dire circumstances. The researcher should write any ideas or feelings during the interview that may help reduce phenomenology. For the data collection and verbatim transcription, the researcher must listen to the tape recorder during reading transcription for accuracy [14].

**Data analysis**

The main purpose of data analysis is to preserve the

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uniqueness of each individual's lived experiences. The data analysis starts by listening to the participant's verbal description and reading and rereading the verbatim transcriptions [15]. Investigators absorb the data that may support classifying and extracting substantial reports, then record these statements into index cords. After that, record it in the record management file. It is reported that by free imagination difference, the investigator develops some links among statements gathered during the interviewing process. For data storage and retrieval, the microcomputer and word processing software may be used effectively for better outcomes.

**Trustworthiness and Authenticity of Data**

Persistent utilization of method and bracketing of previous knowledge guarantees accurate data descriptions. To confirm the data analysis's credibility, the investigator goes back to every participant. The researcher must return to the analysis and revise the theme if the elements seem uncertain [16]. For establishing the genuineness and credibility of the data, the negative descriptions of an event may be beneficial. Lastly, an audit trail is reasonably important to create authenticity and trustworthiness. It is affirmed that credibility, transferability, dependability, and confirmability are essential to establish trustworthiness. Moreover, credibility substitutes internal validity, transferability for external validity, and dependability for reliability. Finally, confirmability acquires the objectivity of an event that is under investigation. The utilization of triangulation will support to reduce the biases. More importantly, triangulation helps strengthen a study's credibility and dependability [17].

**Application in practice**

Crotty described that the phenomenology of nursing is an inquiry into nursing as a phenomenon. Life experiences are best explored in this inquiry, like the experiences of nurses who work in psychiatric wards. In addition, caring, reassurance, sympathy, and empathy are rightly linked with the subjective domain and are best explored by phenomenological inquiry. Coping with breast cancer female best experiences or perception about the disease [18].

**Application in nursing education**

Nursing education provided the greatest domain for conducting a phenomenological study, like the educational experiences of students and teachers, students' performances, and emerging cultural sensitivity [19].

**Application in nursing admiration**

In nursing admiration, phenomenology inquiry is a great option to explore the phenomena such as nurses' professional attitude and behavior, job satisfaction, job stress, qualities of a successful leader, and motivational derive of nurses [20].

**Table 1:** Application of Phenomenology Inquiry in Nursing Practice

| First Author | Sample size | Objective of the study | Study population | Results |
|---|---|---|---|---|
| White JH et al / 2021 [21] | 13 nurse managers | To understand the experiences of hospital nurse | Nurses | Nurse mangers highlighted the nurses emotional and physical wellbeing |
| Chegini Z et al/ 2021[22] | 15 nurses | To describe the experiences of critical care nurses caring for patients | Nurses | Emotional support as well as psychological counselling play vital role in maintaining nurses' optimal mental health |
| Jang HY et al/ 2022 [23] | 14 nurses | To understand and describe the experiences of nurses who cared for patients with COVID-19 | Nurses | The results of this study are valuable primary data for developing suitable measures for health professionals' well-being during outbreaks of infectious diseases |
| Morrell-Scott N et al / 2022 [24] | 18 student nurses | To perceive final -year student nurses around their perception of the role of the nurse | Student nurses | It is perceived that students undertake a very task-orientated role, and holistic care was mentioned by the participants marginally |
| Dahal P et al/ 2020 [25] | 16 nurses | To describe the lived experiences of nurses who provide aesthetically pleasant care in nursing practice for cancer patients | Nurses | The inductive knowledge from the experiences of the nurses informs the nursing discipline and profession to promote aesthetics in nursing |

## CONCLUSIONS

It is concluded that phenomenology is a qualitative inquiry that focuses on the real-life experiences of individuals. Phenomenology inquiry can be used in nursing practice, nursing education as well as nursing research to explore the phenomena considerably.

## Conflicts of Interest

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**Review Article**

# Implementation of Peri-Operative Strategies for Prevention of Surgical Site Infection

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## ABSTRACT

Surgical site infection (SSI) is also known as nosocomial or health acquired infection which is increasing day by day and augmenting morbidity and mortality rate. The presence of the SSI shows the signs and symptoms including redness, pain, heat, presence of pus, and many more. Despite improvements in operational practice and contamination control strategies, SSI plays a major role in high morbidity and mortality and places a heavy burden on the resources of medical services. The purpose of this review article is collection of data that already exists about the pre-operative, intra-operative and post-operative strategies for prevention of the SSIs. The data about the SSI has been collected from the different review articles and research papers. Different keywords like prevention of SSI, cure from SSI, epidemiology of SSI, causes of SSI, and peri-operative strategies for prevention of SSI were used for data collection. Implementation of the pre-operative, intra operative and post-operative strategies can reduce or completely eliminate the surgical site infection. The morbidity and mortality rates that are directly linked with the SSI can be decreased by the alteration of different factors including operation theatre environment, treatment related factors and patient related factors. A proven and thorough strategy to lower the incidence of SSIs is SSI surveillance. Maintaining operation theatre quality is also essential for SSI reduction. But more research is still needed to improve the standards for regular infection control and surveillance in hospitals.

## INTRODUCTION

Surgical site infections (SSIs) are described as infections happening in the span of 30 days after a surgical operation and influencing either the cut or deep tissue at the surgical site. This infection causes deep organ contaminations. Despite improvements in operational practice and contamination control strategies, SSI plays a major role in high morbidity and mortality and places a heavy burden on the resources of medical services. The frequency of the contamination can be decreased by implementing proper techniques during surgical procedure. This requires a precise methodology with reference to risk factors connected with the patient, the strategy, and the medical environment [1]. In some cases, SSI infection can be superficial with only the involvement of the skin. The presence of the surgical site infection shows the signs and symptoms including redness, pain, heat, presence of pus, and many more. SSI is the third most commonly reported nosocomial infection in the patients. SSIs increase the

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mortality rate and it is a hospital-acquired infection. In the mid of 19th century, fever developed in the patient, followed by the drainage of the pus from the incision. Postoperative infection ratio was decreased by implementing techniques of antisepsis properly. This thoroughly changes surgery by decreasing the surgical site infection and death rate [2]. Prior to the surgical incision, the skin of the patient at the site of operation is cleaned with an antiseptic solution in the operating theater. The purpose of disinfecting the skin is to reduce the amount of microorganisms present on the skin and, therefore to reducing the risk of surgical wound infection [3]. Surgical wounds have following different classifications. Clean wounds, clean-contaminated, and fully contaminated wounds are included in this classification. It depends on the area of the incision, the level of infection and the area of inflammation. Infection is less likely to occur after a surgical operation if it is classified as clean. The report of different studies shows that external and internal factors can also cause surgical site infections. Internal factors are patient-related i.e., older age, dehydration, co-existing disease and diabetes, and external factors are surgical procedure-related i.e., procedure's length, working ethics of the surgeon, stability of pre-operative skin preparation, and availability of antibiotic prophylaxis [4]. Different studies show that microorganisms play a vital role for causing surgical site infections. The microorganisms *Staphylococcus aureus* and *Methicillin-Resistant Staphylococcus aureus* (MRSA) are main causative microbes for causing SSI. *S. aureus* and MRSA cause medical complications, which result in increased postoperative hospital stay and ultimately increasing hospital expenses [5]. According to the Centers for Disease Control (CDC), there are four main types of wounds. A clean wound is one that is not infected, is not inflamed, and has not yet been reached by the alimentary, respiratory, genital, or uninfected urinary tracts. Blunt trauma surgical incisional wounds; clean-contaminated wounds, the surgical wounds that are entered by sterile techniques such as the gastrointestinal, respiratory, vaginal, or urinary systems; and contaminated wounds include open or accidental wounds that are highly contaminated. For instance, acute inflammation is prevalent after procedures with significant blockage brought on by leaks from the gastrointestinal tract and incisions that do not contain pus. These procedures primarily involve filthy, infected wounds, traumatic wounds, and lacerated wounds as mentioned in Figure 1 [6].

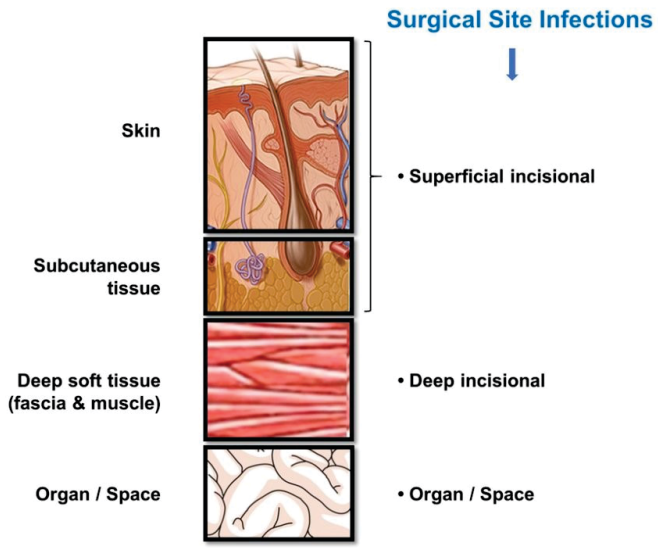


**Figure 1:** Proliferation steps for causing SSI [6]

## METHODS

The information about the SSI has been collected from the different review articles and research articles. Analyses of the many articles, review articles, and deep study of the databases have been used to get information about peri-operative strategies of SSI. Different keywords like prevention of SSI, prevention of SSI, Epidemiology of SSI, causes of SSI, peri-operative strategies for prevention of SSI were used for information collection.

### Risk Factors for Surgical Site Infection

#### Patient-Related Factors

In the favor of patient-related risk factors, the top risk factors are serum albumin concentrations and advanced age. The serum albumin concentration is a nutritional status indicator. The serum albumin is important as an index of surgical risk [7]. Old age is another component, given the probability that old patients have organ dysfunction and comorbidities and get treatment indicating anticoagulation and corticosteroids that augment further the risk of disease. In a worldwide populace described by expanding age and by elevated standards of life prolongation, numerous surgeries are presently done on older patients highlighting different risk factors and related multi-morbidities [8]. For instance, older patients with the malignant growth of the upper gastrointestinal tract regularly have disabled physiologic capability, unhealthiness, and a depressed immune response and logically will go through a clean-contaminated procedure, seriously endangering them for SSI. Physiologic changes and organ malfunction describe increasing age, including all body systems that influence adversely the patient's response to operation. Increasing age, usually more than 65years, predicts a higher chance of

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SSI multi-morbidity [9].

**Treatment-Related Factors**

Lack of implementation of proper surgical techniques and insufficient concentration on the procedure's technical flaws can cause infection after the procedure [10]. Following are the strategies for the prevention of SSIs as mentioned in Figure 2 [4].

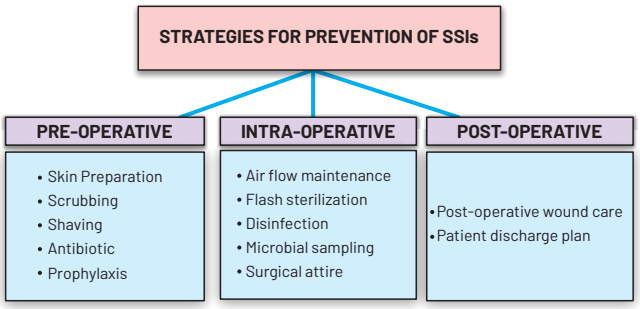


**Figure 2:** Strategies for the prevention of SSIs [4]

**Pre-Operative Strategies**

Pre-operative strategies include skin preparation to decrease risk of infection. For this purpose, mostly used anti-septic agents contain alcohol products, chlorhexidine gluconate and iodophors. Alcohol including ethyl alcohol or isopropyl alcohol is considered most viable for the preparation of the skin. The volume of ethyl alcohol used is 60-90%, and isopropyl 50-90% [11]. Alcohol has bacterial, fungicidal and virucidal properties, but few spores show resistance to alcohol [12]. According to the CDC instructions, "hand hygiene" can help to decrease the transfer of microorganisms that cause surgical site infection. Trimming of the nails and the proper use of an antiseptic agent for cleaning and its drying are the guidelines that are provided by the CDC for control of SSIs. Shaving of the procedure site causes an increase in SSIs (5.6%) as compared to the removal of hair by other method (0.6%), traumas caused by shaving in the skin provide favorable condition to bacteria for growth and provide a medium for replication [13]. Proper educational programs and policies should be created among health departments to decrease the infection linked with microorganisms associated with movement of patients, which in turn limit hospital-acquired infections among after surgery patients. Before the surgical procedure, the delivery of antibiotic prophylaxis has been shown to seriously decrease the risk of infections related to surgical procedures. The use of antibiotic drugs prophylactically permits the availability of proper concentrations in tissue so, decrease microbial load and inhabitance at the incision area [14]. The SSI can be reduced by the administration of the antibiotics, known as the antibiotic prophylaxis and thus, it is effective or beneficial for most of the situations. Improper administration of the antibiotic can be harmful instead of positive response. Antibiotic prophylaxis is not the exact cure, its administration before the procedure may prove beneficial or harmful for patients [15]. The patient should be evaluated for factors that can be treated in the preoperative period. The skin lesions should be permitted to heal if possible, and the patient should be liberated from bacterial diseases of any sort before the elective medical procedure. The patient should stop smoking, if possible, ideally before the medical procedure. The patient should not be shaved the prior night, as the chances of SSI are plainly expanded by microscopic organisms that colonize the little cuts and scraped spots. Specific consideration should be paid to the nutritional status as well. Just 5 days of nutritional carefulness can reduce the risk of SSI effectively [16].

**Patient Preparation**

Where possible, recognize and treat already present disease, and try to defer a medical procedure through conservative method of giving medicine. Try not to shave hair on all sides of the incision site, except if it will disrupt the procedure. Presuming hair to be removed, this should be done beforehand, preferably with trimmers. Avoid higher blood sugar levels in diabetic patients, this will help to avoid perioperative hyperglycemia. Recommend the patient to avoid tobacco and ask patients to shower with a sterile solution essentially the night prior to the procedure. Wash the area around the incision site to eliminate contamination prior to implementing germ-free skin preparation. Use highly effective antiseptic solution for the preparation of skin like povidone-iodine [4]

**Hand Scrubbing of Surgical Team**

The person or individual who has to be in direct contact with sterile field or operating area or supplies that are used in OT should wash their hands up to forearms with appropriate asepsis techniques just before doing or wearing gown and gloves. The antiseptic should have a broad-spectrum activity [17]. The most common antiseptics nowadays are Povidone-iodine and chlorhexidine gluconate. There are some factors that increase the effectiveness of scrub and these are techniques of the scrubbing, duration of scrubbing, drying and gloving techniques. At least, two minutes of proper scrubbing is effective than traditional scrubbing. Keep nails trimmed and avoid wearing artificial nails prior to procedure. Perform scrub for 2 to 5 minutes utilizing a suitable germ-free solution preoperatively. After carrying out the hand scrub, stay your hands up and away from the body surface. Dry your hands with a sterile cloth and wear a clean surgical gown and hand gloves [18].

**Management of Infected Surgical Staff**

Contagious disease symptoms and side effects should be made known to surgical employees so they can alert their

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managers and the occupational health administration right away. Develop distinct approaches regarding patient consideration obligations when personnel have possibly contagious situations. It is necessary that hospitals implement policies that are effective against the transmission of the microorganisms from personnel to patients. The policies should maintain the hospital acquired disease, hospital related exposure and exclusion of ill person from hospital or from contact of patient. Policies should be powerful that can eliminate ill personnel and should encourage the ill personnel to provide information when they are ill [19].

**Antimicrobial Prophylaxis**

Manage antibacterial prophylaxis just when necessary and choose the agent as per viability against most normal microbes related to a particular operation. Give the IV-coordinated initial dosage so that tissues and antibiotics have bactericidal concentrations when the surgical cut is made. Prepare the colon physically by using enemas and cathartic agents prior to any elective colon-related procedures. Make sure the administration of oral antibiotics before procedure [4].

**Intra Operative Strategies**

Surgical site infection may be the result of microbes that are present on the surgical incision [20]. Ventilation and humidity of the OR are significant factors in diminishing the chance of surgical site infection. To try not to get possibly contaminated air arriving at the careful suite, in the surgical operation room (OR), pressure should be positive as compared to outside the room. For best results, there must be no less than fifteen air changes per hour. To stop the growth of molds and organisms, humidity must be preserved at a distinct level [21]. Natural surfaces are not spreading infections. The surfaces that look clean but not actually, they spread the infection. The disinfection of the OR with a disinfectant before the next case can reduce the surgical site infection. The disinfectant should be approved by the environmental protection agency (EPA). As per Occupational Safety and Health Administration (OSHA) prerequisite, surfaces of the hospital ought to be cleaned after exposure to blood or other body fluid. At the end of night or day, a disinfectant authorized by the EPA, should be used on a routine basis for cleaning the floor and walls of the operation theatre [22]. The mats have no role in the reduction of microorganisms that are present on wheels of stretchers or shoes. So, there is no need for mats in the hospital [23]. Infections at the surgical site can be managed if the anesthetic team and those in scrubs follow aseptic procedures. Different studies connected with theatre visits uncovered that anesthesia staff were involved in the spreading of microbes while putting intra-vascular devices like ETT (endotracheal tubes) and IV (intravenous) medicines. The wrong accomplishment of aseptic techniques during surgical procedures can cause infection after the surgery. But the proper implementation of surgical and aseptic principles can decrease the SSIs rate. There are some factors that increase the surgical site infection rate, including sutures, implants, drains, etc. Some studies show that the surgical site infection rate can be decreased by using suction drains in place of open drains [24].

**Ventilation**

The aim of the laminar airflow is to clean air in aseptic operating field with recommended air changes per hour. Laminar airflow can be vertical or horizontal, air passes through HEPA filters repeatedly. The pressure should be positive in the operating room through doors and related areas. Make sure minimum 15 air changes per hour, including 3 fresh air vents. Filter all air through proper channels. Introduce all air at the roof, and exhaust close to the floor. Avoid use of UV radiation in the operating room to prevent SSI. Keep the operating room doors closed throughout the process, with the exception of when moving personnel, equipment, and patients [23].

**Sterilization of Instruments**

Sterilize all surgical instruments according to recommended guidelines. Flash sterilization is only for the emergency situation. Strategies and techniques should guarantee that the sterilization and disinfection processes follow the principles of disease avoidance as set out by CDC and World Health Organization. Strategies and methodologies should be assessed and endorsed by the Disease Prevention and Control Committee. They should be promptly available to staff doing the reprocessing. Review of reprocessing strategies and techniques should occur at least every year [25].

**Attire and Drapes for Surgical Procedure**

Use the mask that fully covers the mouth and nose area while entering the operating room. Use face mask during the whole procedure. Use a cap to cover fully the hair while entering the OT room. Wear shoe covers to prevent SSI. Surgical team members are advised to wear sterile gloves. Wear gloves after surgical gown. Use drapes and gown which are good barriers when wet [4].

**Surgical Techniques and Asepsis**

Follow rules of asepsis while inserting IV devices or when giving drugs. Hold tissue softly, sustain hemostasis and eliminate dead tissues from the incision site. Always use a closed suction drain. Remove the drain as soon as possible [4].

**Post-Operative Strategies**

Depending on the type of wound the patient has, aftercare of the incision or wound is required. Closed skin incisions and open incisions are the two most typical kinds of

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incisions. In a close incision, the doctor will cleanly bandage the wound; in an open incision, the incision will stay visible while it heals. In the open incision, it should be loaded with a sterile dressing to reduce the risk of infection. The open wound or incision is filled with sterile gauze pieces that contain an antiseptic solution and left the incision for healing. ACS (American College of Surgeons) gives some protocols to change the dressing of incision, including clean gloves and sterile instruments [26]. The risk of SSI can continue for as long as one month after a procedure or for up to one year after the procedure in which the patient is given implants. Currently, patients are discharged timely even before surgical incisions have been healed. The doctor will provide guidance about healing and how to deal it. After a few days of the procedure, most of the wounds start healing. For this type of wound, there is no need for filling of gauze, but covering the area of the wound and changing of the bandage on regular basis with appropriate hygiene may increase the wound healing and protect the wound from further infections. The aim of the discharge planning is to maintain the reliability of therapeutic incision, give awareness about the symptoms of infection, and completely guide the patient about the disease that patient have [27].

**Incision Care**

Cover the wound with the clean bandage up to 48 hours after surgery. Wash your hands before and after changing dressings. The purpose of dressing after the procedure is to provide a barrier between wound and the microorganisms, this ultimately reduce the surgical site infections. Use the dressing which absorb the exudate of the wound and provide physical protection [28].

**Surveillance**

The Observation of SSIs, and revealing proper information back to doctors, has been proved to be viable parts of strategies to minimize the risk of SSI. The CDC rules suggest that both direct and indirect strategies ought to be used to record the occurrence of SSIs related with special strategies and that this information should be reported back to the surgical team. For the purpose of identifying SSI in cautious inpatients and short-term patients, follow the CDC control methods for SSI without modification. Use a strategy that complies with readily available resources and information requirements for case finding in the near duration. "Record" the variables that have been shown to be associated with an increased risk of SSI for each patient participating in an activity that has been selected for observation [4, 28].

## CONCLUSIONS

To summarize, the implementation of pre-operative, intra operative and post-operative strategies can help in reducing or completely eliminating the risk of surgical site infection. The morbidity and mortality ratios that are directly linked with the SSI can be decreased by the alteration of different factors including OT environment, treatment related factors and patient related factors. Complete contribution of all individuals including operation theatre staff, manager, surgeons, nurses, and all staff can reduce the SSI ratio. The CDC recommendations for prevention of SSIs emphasize the importance of good patient preparation, aseptic conditions, and adherence to sterile surgical procedure. Antimicrobial prophylaxis is also advised in specific situations. All in all, SSIs prevention calls for a comprehensive strategy and the involvement of everyone concerned, including those in charge of operating room layout, design, and management. To further decrease infection, additional study into prevention strategies and strict adherence to the application of recognized evidence-based techniques to mitigate SSIs are still needed.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# A Scientometric Analysis of Research Productivity in Surgery from Arab Countries (2001-2021)

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## ABSTRACT

Several surgical procedures are being performed on daily basis globally along with continuously expanding research in all surgery fields. **Objective:** To assess the surgery related research trends and performance in Arab countries using bibliometric indicators. **Methods:** In this descriptive bibliometric study, data were extracted from the Web of Science (WoS). All surgery related English language articles, from 2001 to 2021 from Arab countries were analyzed in R-Bibliometric package. **Results:** There were 10,269 articles in English language, with 158 authors' countries. There was increase in publications each year with escalating trend from 2017 onwards. Al-Qattan MM was the leading author with >200 publications and >2000 total citations (TC), while the highest h-index was demonstrated by Alio 25. Egypt, USA and Saudi Arabia were leading in production and TC. Cairo University (Egypt) and King Saud University (Saudi Arabia) were the leading affiliations. International Journal of Surgery Case Reports was the leading source. Case report, bariatric surgery, surgery, laparoscopy and sleeve gastrectomy were the most frequently used keywords. **Conclusions:** This study showed increasing publications over time with more productivity since 2017. The magnitude and increasing trend of obesity and bariatric surgery-research was observed. Egypt and Saudi Arabia were leading contributors, which signifies the need of more efforts from other Arab countries. More collaboration among Arab researchers, increase in funding sources, efforts toward high impact research in the field of surgery, and support for less resourceful countries are warranted in future.

## INTRODUCTION

Surgical interventions and procedures are part of human history, and some procedures can be traced back to twelve thousand years [1]. With better anesthesia and surgery techniques, number of surgical procedures has increased significantly. In 2004, it was estimated that more than two hundred and thirty million surgeries were performed worldwide, and the number was increased to approximately three hundred and ten million in 2012 [2, 3]. Several surgical procedures are being performed on daily basis globally. It is not surprising that research is also evolving in surgical fields. Research is expanding in all surgery fields. A lot of surgical procedures are being performed in Arab countries. For example, more than 3.86 million surgeries were performed in Saudi Arabia from 2016-2019 [4]. Disease burden is also increasing in Arab population. A study shows high burden of thyroid diseases in the Arab world [5]. Similarly, number of surgeries in Saudi Arabia has increased substantially [6]. In an alarming study, it is predicted that there will be four-to-fivefold increase in cancer diseases and cancer-related deaths in the Gulf Cooperation (GCC) Countries by the year 2040 [7]. The incidence of obesity and prostate cancer is also increasing in these countries [8, 9]. Disease burden of vision loss is also substantial [10]. It can be assumed that disease load is high in Arab countries, and so the need of surgery to manage those diseases. With this increase in number of surgeries, it is predicted that research production would be boosted as well. Research is an integral component in the

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knowledge-based economy of GCC countries, and it is included in the Saudi Vision 2030 as well [11, 12]. Although, many research publications can be found in literature from Arab countries, but it would be worth noting whether the contribution is significant. Consequently, we cannot appreciate whether surgery research is strategically targeting areas where research need is the greatest in the Arab countries to improve health care outcomes in society. To the best of our knowledge, no study in the literature seems to have investigated about surgery publications holistically from Arab countries. The objective of this study was to provide the first bibliometric analysis of surgery research generated by Arab countries. Specifically, the study aimed to identify trends and performance in surgery publications, country-specific and author-specific contributions, the degree of national and international collaboration, the major areas of research focus and highly cited research work.

## METHODS

It was a descriptive bibliometric study. The study explored all the published documents from 2001 to 2021 on surgery research in Arab countries. The database was accessed through the electronic library portal of King AbdulAziz University (KAU). On November 4th, 2022, an online search of the Web of Science (WoS) database, hosted by Clarivate Analytics, was conducted as described in previous studies [13, 15]. The WoS database is of the leading and reliable sources of scientific literature [16, 17]. From the Web of Science Categories, 'Surgery' was selected as it includes the documents related to our study scope only. Institutional review board approval was not required given the publicly available nature of the data without protected health information. The twenty-two countries of the Arab League were included in the study. The countries, already mentioned in the literature [18, 19], are: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kingdom of Saudi Arabia (KSA), Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Somalia, Sudan, Syria, Tunisia, United Arab Emirates (UAE), and Yemen. Two researchers (MI and AAM) independently searched and extracted articles to verify the process on the same day (November 4th, 2022). The Boolean search query method was exercised. The searching key terms comprised a wide range of key terms and included Keywords. The key data features that were extracted included: study title, author(s) name(s), key words, institution, publication year, journal name, and country. All data, including the number of publications, number of citations, and other aspects, were based on the Web of Science Core Collection (WoSCC) database. R-Bibliometric package, a comprehensive and widely used tool [20], was utilized. The documents related to Dentistry, Oral Surgery and Medicine were also excluded. The search strategy used was: WC = (Surgery NOT Dentistry, Oral Surgery & Medicine) AND CU= (Algeria or Bahrain or Comoros or Djibouti or Egypt or Iraq or Jordan or Kuwait or Lebanon or Libya or Mauritania or Morocco or Oman Or Palestine or Qatar or Saudi Arabia or Somalia or Sudan or Syria or Tunisia or United Arab Emirates or Yemen) and English (Languages) and Article (Document Types). The bibliometric flowchart is shown in figure 1.

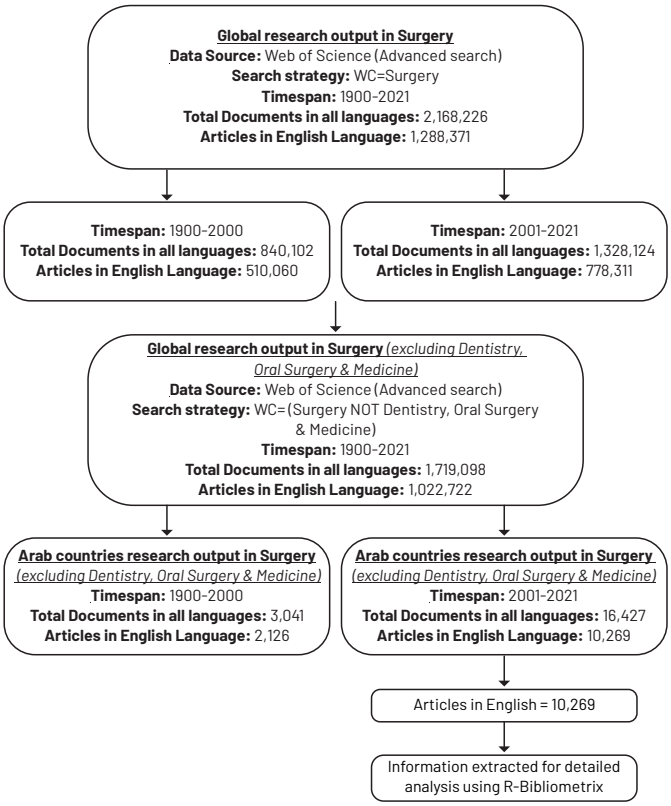


**Figure 1:** Bibliometric flowchart

## RESULTS

The total number of documents indexed in WoS, with surgery as web of science category (excluding Dentistry, Oral Surgery & Medicine), from 2001 to 2021 were 1,090,816 from 476 sources and > 206 countries, with USA, England, Japan, German and China contributing around 60.6%, 34.6%, 7.9%, 6.9%, 6.3% & 4.9% respectively, while top 10 countries collectively contributed for > 2/3rd. Documents were found to be related to 42 research areas and 52 WoS categories (other than surgery) led by Transplantation (13.7%), Clinical Neurology (11.8%), Cardiac Cardiovascular Systems (9.1%) and Orthopedics (8.3%). Articles (58%) were found to be the leading document type (n=632,800) followed by meeting abstracts (17.2%). Reviews articles were around 4.8%. The total number of authors' appearances was > 100,000. Around 256,062 (23.5%) documents were in the open access category and 13.8 %

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showed any funding source. Arab countries contribution was 16,427 documents, representing around 1.5% of the global productivity. Among them, Egypt (n=5649), KSA (n=3812), Lebanon (n=1,345), U Arab Emirates (n=1310) and Morocco (1,007) were leading from the region with global ranking (%) at 28th (0.51%), 35th (0.35%), 48th (0.12%), 49th (0.12%) and 54th (0.09%) respectively. Articles represented 65.1% (10,691) followed by meeting abstracts 2,440 (14.8%) and review papers 1,293 (7.9%). The results, including documents with English language, are summarized in table 1.

| Description | 2001-2021 |
|---|---|
| Documents | 10269 |
| Annual growth rate (%) | 10.65% |
| Open access | 3136 |
| Sources (Journals, Books, etc.) | 302 |
| Average years from publication | 6.98 |
| Average citations per documents | 10.04 |
| Average citations per year per doc | 1.166 |
| References. | 199356 |
| **Document Contents** | |
| Keywords Plus (ID) | 14342 |
| Author's Keywords (DE) | 17881 |
| Authors | 43731 |
| Author Appearances | 74141 |
| Authors of single-authored documents | 515 |
| Authors of multi-authored documents | 43216 |
| **Authors Collaboration** | |
| Single-authored documents | 850 |
| Documents per Author | 0.235 |
| Authors per Document | 4.26 |
| Co-Authors per Documents | 7.22 |
| Authors' countries | 158 |
| Group Authors | 121 |
| Collaboration Index | 4.59 |
| **Other Information** | |
| Research Areas | 32 |
| Web of Science categories | 36 |
| Affiliations | 7967 |
| Funding Sources | 1259 |
| **Document Types** | |
| Article | 32 |
| Article; early access | 36 |
| Article; proceedings paper | 7967 |
| Article; proceedings paper; retracted publication | 1259 |
| Article; retracted publication | |

**Table 1:** Summary table (2001-2021)

Figure 2 shows the rising publication trend which significantly increased from 2017 onwards with a maximum production in the year 2021. Mean total citation (TC) was higher in the first decade, with a maximum number in 2002 (figure 2).

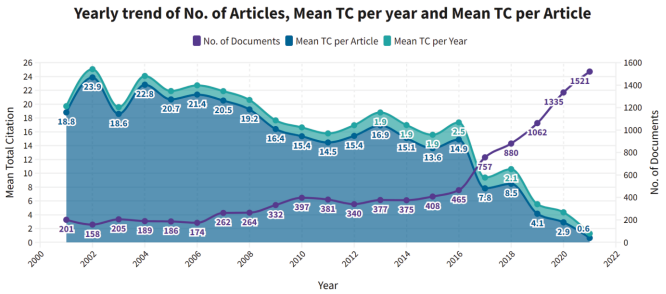


**Figure 2:** Yearly trend of no. of articles, mean total citation (TC) per article and mean total citation per year (2001-2021)

Table 2 shows the top twenty most productive authors along with their impact. Al-Qattan MM was leading in the number of publications (>200), total citations (TC) (>2000), first and corresponding authorship. The highest h-index was displayed by Alio JL (25) followed by Al-Qattan MM (23).

| Authors | *PY start | No. of Documents | % as *FA | % as *CA | *AF | h-index | *TC |
|---|---|---|---|---|---|---|---|
| Al-Qattan MM | 2001 | 206 | 86.9% | 97.1% | 140.22 | 23 | 2022 |
| Abu-Zidan FM | 2001 | 65 | 26.2% | 66.2% | 16.64 | 17 | 856 |
| El Nakeeb A | 2009 | 52 | 36.5% | 69.2% | 7.35 | 19 | 1019 |
| Emile SH | 2006 | 52 | 40.4% | 76.9% | 10.21 | 11 | 333 |
| Shafik A | 2001 | 48 | 95.8% | 95.8% | 13.57 | 11 | 422 |
| Alio JL | 2014 | 44 | 63.6% | 88.6% | 10.38 | 25 | 1739 |
| El-Menyar A | 2014 | 41 | 22.0% | 65.9% | 5.7 | 11 | 343 |
| Farid M | 2007 | 40 | 17.5% | 0.0% | 6.89 | 15 | 723 |
| Al-Thani H | 2010 | 39 | 15.4% | 5.1% | 5.51 | 11 | 335 |
| Shafik AA | 2002 | 38 | 10.5% | 10.5% | 9.88 | 13 | 260 |
| Nampoory MRN | 2002 | 37 | 8.1% | 2.7% | 4.67 | 11 | 305 |
| Youssef M | 2001 | 37 | 8.1% | 2.7% | 5.17 | 14 | 717 |
| Ibrahim M | 2014 | 35 | 22.9% | 25.7% | 8.04 | 11 | 343 |
| Omar W | 2003 | 33 | 9.1% | 6.1% | 5.83 | 13 | 440 |
| Salah T | 2015 | 33 | 3.0% | 0.0% | 3.62 | 11 | 451 |
| Wahab MA | 2008 | 33 | 54.5% | 30.3% | 3.97 | 10 | 342 |
| Al-Mousawi M | 2010 | 32 | 9.4% | 9.4% | 4.86 | 11 | 300 |
| Morris DL | 2008 | 32 | 0.0% | 75.0% | 5.68 | 10 | 268 |
| Samhan M | 2010 | 31 | 22.6% | 22.6% | 5.01 | 12 | 319 |
| Ansaloni L | 2001 | 30 | 0.0% | 0.0% | 0.61 | 17 | 1046 |

*:PY - Publication year, FA - First author, CA - Corresponding author, AF - Articles Fractionalized, TC – Total citations

**Table 2:** Top 20 most productive Authors and their impact (2001-2021)

Table 3 shows that Egypt was leading with the highest productivity (n=6548) followed by USA (n=4330) and Saudi Arabia (n=4287). Regarding TC, again Egypt, Saudi Arabia and USA were prominent with the number of citations 22504, 14060, and 13691 respectively. Overall, Egypt showed highest MCP (n=383) followed by Saudi Arabia (n=315).

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| Country | Articles | CA | Percentage Contribution | SCP | MCP | MCP Ratio | *TC |
|---|---|---|---|---|---|---|---|
| Egypt | 6548 | 2811 | 27.5% | 2428 | 383 | 0.136 | 22504 |
| USA | 4330 | 886 | 8.7% | 21 | 865 | 0.976 | 13691 |
| Saudi Arabia | 4287 | 1562 | 15.3% | 1247 | 315 | 0.202 | 14060 |
| United Kingdom | 1845 | 252 | 2.5% | 12 | 240 | 0.952 | 5940 |
| Canada | 1399 | 274 | 2.7% | 3 | 271 | 0.989 | 4663 |
| Lebanon | 1396 | 437 | 4.3% | 319 | 118 | 0.270 | 3618 |
| Italy | 1243 | 122 | 1.2% | 1 | 121 | 0.992 | 1592 |
| France | 1239 | 290 | 2.8% | 83 | 207 | 0.714 | 3443 |
| Tunisia | 956 | 428 | 4.2% | 400 | 28 | 0.065 | 3627 |
| Morocco | 930 | 414 | 4.1% | 389 | 25 | 0.060 | 1971 |
| Jordan | 786 | 298 | 2.9% | 231 | 67 | 0.225 | 2305 |
| Germany | 748 | 173 | 1.7% | 5 | 168 | 0.971 | 2479 |
| Spain | 699 | 102 | 1.0% | 0 | 102 | 1.000 | 2663 |
| Qatar | 618 | 187 | 1.8% | 112 | 75 | 0.401 | 1300 |
| Kuwait | 610 | 271 | 2.7% | 214 | 57 | 0.210 | 3422 |
| Iraq | 565 | 228 | 2.2% | 199 | 29 | 0.127 | 1291 |
| Australia | 530 | 79 | 0.8% | 1 | 78 | 0.987 | 1247 |
| China | 415 | 71 | 0.7% | 1 | 70 | 0.986 | 530 |
| Japan | 391 | 126 | 1.2% | 0 | 126 | 1.000 | 1627 |
| India | 349 | 50 | 0.5% | 5 | 45 | 0.900 | 290 |

CA - Corresponding author, SCP: Single or Intra-country publication, MCP: Multiple or Inter-country publications, TC – Total citations

**Table 3:** Top 20 countries with articles and corresponding authors

Cairo University (Egypt) and King Saud University (Saudi Arabia) were the leading universities regarding affiliations, while United States Department of Health Human Services, National Institutes of Health (NIH) USA, and King Saud University, Saudi Arabia were the top funding organizations. Details of the top 10 most frequent affiliations and funding organizations are shown in table 4.

| Top 10 most frequent Affiliations | Articles |
|---|---|
| Cairo Univ | 1129 |
| King Saud Univ | 882 |
| Ain Shams Univ | 659 |
| Mansoura Univ | 603 |
| Amer Univ Beirut | 553 |
| King Faisal Specialist Hosp and Res Ctr | 424 |
| Univ Alexandria | 326 |
| Zagazig Univ | 316 |
| Alexandria Univ | 238 |
| Univ Toronto | 238 |
| **Top 10 most frequent funding Organizations** | **Articles** |
| United States Department of Health Human Services | 1129 |
| National Institutes of Health NIH USA | 882 |
| King Saud University | 659 |
| NIH National Cancer Institute NCI | 603 |
| European Commission | 553 |
| UK Research Innovation UKRI | 424 |
| National Institute for Health Research NIHR | 326 |
| Medical Research Council UK MRC | 316 |
| Qatar National Library | 238 |
| Canadian Institutes of Health Research CIHR | 238 |

**Table 4:** Top 10 most frequent affiliations and funding sources

Figure 3 shows the year-wise growth of the ten most productive sources (journals) over the span of last two decades. International Journal of Surgery Case Reports, Egyptian Journal of Surgery, and Transplantation Proceedings were the leading sources with 669, 476, and 375 articles respectively. Case report (n=293), bariatric surgery (n=204) surgery (n=203), laparoscopy (n=196), and sleeve gastrectomy (n=164) were the most frequently used keywords. Besides, children, obesity, and complications were used >100 times.

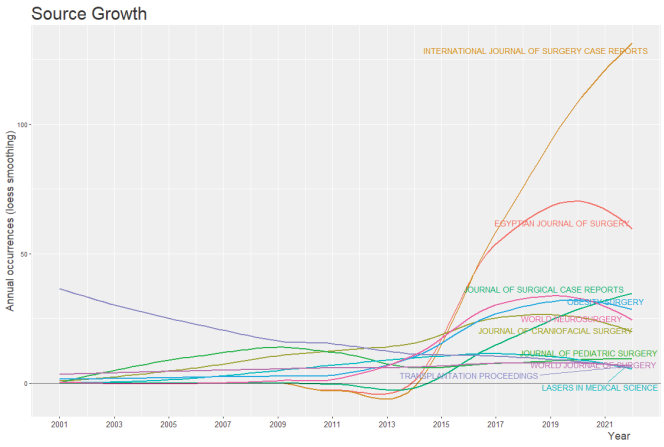


**Figure 3:** Year-wise growth of 10 most productive sources

Figure 4 shows the conceptual structure word map of twenty most frequent key words with two possible clusters, using the multiple correspondence analysis (MCA). The left (red) cluster is a combination of 15 key words related to different types of surgery and research category. On the other hand, right (blue) cluster manifests 5 key words related to obesity and related procedures.

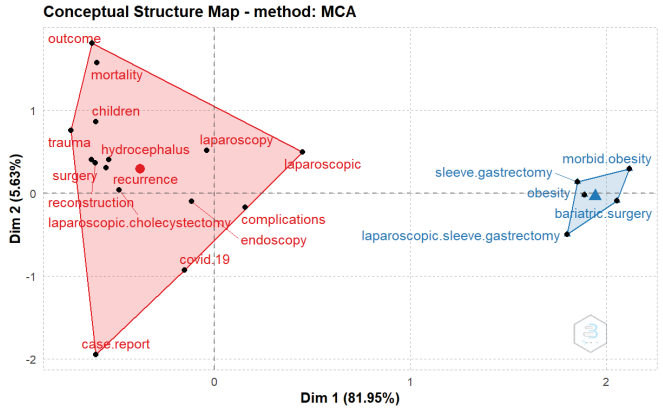


**Figure 4:** Conceptual structure word map of key words with multiple correspondence analysis

Table 5 summarizes the top 10 highly cited documents. Agha RA was the leading contributor, with three highly cited documents, followed by Noun R, Gagner M, and Hamza AF. International journal of Surgery was the leading journal. Study types were mixed, including guidelines, observational studies, randomized controlled trial,

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retrospective review, and case series.

| Title | First Author | Study Type | Source | IF/ JIF Quartile | Year | IC | GC |
|---|---|---|---|---|---|---|---|
| The SCARE 2018 statement: Updating consensus Surgical Case Report (SCARE) guidelines | Riaz A Agha | Guidelines | International Journal of Surgery | 13.4/ Q1 | 2018 | 328 | 2327 |
| The SCARE 2020 Guideline: Updating Consensus Surgical Case Report (SCARE) Guidelines | Riaz A Agha | Guidelines | International Journal of Surgery | 13.4/ Q1 | 2020 | 107 | 875 |
| The SCARE Statement: Consensus-based surgical case report guidelines | Riaz A Agha | Guidelines | International Journal of Surgery | 13.4/ Q1 | 2016 | 103 | 1273 |
| One thousand consecutive mini-gastric bypass: short- and long-term outcome | Roger Noun | Observational | Obesity Surgery | 3.479/ Q2 | 2012 | 25 | 161 |
| Survey on laparoscopic sleeve gastrectomy (LSG) at the Fourth International Consensus Summit on Sleeve Gastrectomy | Michel Gagner | Survey | Obesity Surgery | 3.479/ Q2 | 2013 | 16 | 201 |
| Caustic esophageal strictures in children: 30 years' experience | Alaa F Hamza | Observational | Journal of Pediatric Surgery | 2.549/Q2 | 2003 | 14 | 103 |
| Laparoscopic hernia repair in infancy and childhood: evaluation of 2 different techniques | Rafik Shalaby | Randomized controlled | Journal of Pediatric Surgery | 2.549/Q2 | 2010 | 14 | 47 |
| Phalangeal neck fractures in children: classification and outcome in 66 cases | M M Al-Qattan | Case series | Journal of Pediatric Surgery | 2.206/Q3 | 2001 | 13 | 56 |
| Laparoscopic sleeve gastrectomy in 108 obese children and adolescents aged 5 to 21 years | Aayed R Alqahtani | Retrospective review | Annals of Surgery | 13.787/Q1 | 2012 | 13 | 116 |
| Neurosurgical virtual reality simulation metrics to assess psychomotor skills during brain tumor resection | Hamed Azarnoush | Pilot study of innovative metrics | International Journal of Computer Assisted Radiology and Surgery | 3.421/Q2 | 2015 | 13 | 49 |

IF - Impact Factor, IC - Internal Citation (Citations within study selected documents), GC - Global Citation (Citation in Web of Science)
**Table 5:** Top 10 highly cited documents

## DISCUSSION

Overall, 22 Arab countries had <2 % research output comparing to global research production. The USA, England, Japan, German, and China were main contributors. Other studies, also, supports our findings of such predominance. In a recent analysis, it is shown that around 30% of publications on spinal stenosis are contributed by the U.S.A. [21]. In one bibliometric analysis of head and neck surgeries, the publications from Arab world were negligible [22]. However, in the region, a substantial increase can be observed during last two decades. Articles were the major type of publication among Arab countries. Egypt was leading in the number the publications, followed by KSA, Lebanon and U Arab Emirates. This shows the trend of research productivity. Our findings are consistent with a bibliometric study on research production in Arab countries, in which overall research productivity was analyzed, and Egypt and Saudi Arabia were leading [23]. Last five year were quite significant in surgery-related research production, and a gradual increase is encouraging. It was observed that, overall research growth rate in Saudi Arabia alone was 17.7%. Collaborative work of Egypt and Saudi Arabia is also worth mentioning [24]. In GCC countries, Saudi Arabia has the highest number of publications related to road traffic accidents. Again, collaborative work of Saudi Arabia with USA and Egypt was observed [25]. It is a noteworthy that publications from the resource-limited Arab counties are less – the issue which need global attention. Among countries, Egypt and Saudi Arabia, from the Arab region, are leading in most of the parameters, including the number of articles, CA, percentage contribution, SCP, MCP, and TC. Interestingly, USA is leading in many aspects. Number of articles, MCP and MCP ratio are more significant, showing collaboration at country level. Our study is aligned with the literature that USA is leading in many areas of research. For instance, USA is leading in surgery-related research topics, such as urology, robotic surgery, and pancreaticoduodenectomy, among many other areas [26-28]. It is worth mentioning that, though, majority of articles from Arab countries are contributed as single or intra-country publications and MCP ratio of Arab countries is relatively quite low – the area to be focused for future work. Among top funding organizations, only two were from Arab countries - one from Saudi Arabia and the other from Qatar; all others were from USA, Canada, and European countries. It has been argued that funding and international collaboration have a key position in scientific research [29]. More efforts are needed by Arab countries in this context, especially the low-income countries. When Journal Impact Factor (JIF) Quartile among top ten productive sources was searched, four journals fall in Q2, one in Q3, two in Q4, while three in Emerging Sources Citation Index (ESCI). Among four journals with more than 300 published articles, International Journal of Surgery Case Reports had a sudden peak during last seven years. Egyptian Journal of Surgery also shows same trend, but

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there is a plateau during the last two years and then a gradual fall can be observed. On the other hand, Transplantation Proceedings was on top during first decade, and a gradual decrease can be observed. Journal of Craniofacial Surgery also contributed more during the last decade. Obesity Surgery and World Neurosurgery, with >250 articles, are also trendy. Journal Of Surgical Case Reports, with >150 articles, is gaining prominence among research from Arab region, especially from 2015 onward. Keywords and top ten productive sources interrelate the observations of research trend in Arab region. For most frequent keywords, case report is at the top, which may suggest more articles were published as case reports. One interesting observation is the use of bariatric surgery, sleeve gastrectomy and obesity under the most frequent keywords. The keyword – children is also prominent, indicating that research related to pediatric surgery is gaining consideration. The importance of research in this area is also exhibited by a cluster in the conceptual structure map. This signifies the magnitude of research work on obesity and bariatric surgery in the Arab world. There is a strong correlation with obesity-related and bariatric surgery publications globally. A study shows a high flow of research in this area even two decades ago [30]. In a relatively recent bibliometric analysis by Paolino *et al.*, similar results, with increasing publication trends were observed [31]. While analyzing top ten highly cited articles, it can be observed that various study types are included; however, guidelines are leading. It is worth noting that, mostly, the highly cited articles were published in Q1 and Q2 journals. The highly cited documents, in our study, are published in journals which mostly have open access (OA). It has been investigated that OA journals, with and without article processing charges, have a positive correlation with journal impact factors and h-indexes [32]. So, when we compare ten most productive sources and ten highly cited documents, it can be suggested that researchers, from Arab region, should also be encouraged to publish their research in Q1 and Q2 journals. Our findings corelate with other studies. A study, focuses on orthopedic journals, finds paucity of publication from Arab countries in Q1 journals [33]. Another study by Baeesa *et al.*, recommends higher quality spine surgery research papers from Arab countries [34]. In some Arab countries, quantity and quality of breast cancer research is low [35]. It is suggested, in a study by Almarghoub and Al-Qattan, that plastic surgery publications, though growing in number in Arab countries, but mostly are of low-quality research [36]. In ophthalmology, there is a relatively low productivity [37].

## CONCLUSIONS

This study showed that the number of publications has increased over time with more publications since 2017. The magnitude and increasing trend of obesity and bariatric surgery-research in the region. Top ten highly cited documents show mostly guidelines and observational study, though other types are also included. Egypt and Saudi Arabia are leading in publications, which signifies the need of more efforts from other Arab countries. Study findings are of value for surgeons, doctors, and researchers to explore insights into research trends in the field of surgery in Arab countries.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Amniotic Fluid Index and Its Relationship with Poor Apgar Score in Term Pregnancy

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## ABSTRACT

Amniotic fluid bathes the fetus and works as cushion, permits fetal lung growth and prevents fetus from infection. It peaks with gestational age and peaks at 32 -34 weeks of pregnancy. Amniotic fluid index is important and shares important relationship with APGAR (appearance, pulse, grimace, activity and respiration) for fetal wellbeing. **Objectives:** To determine the amniotic fluid index and its relationship with poor APGAR score in term pregnancy. **Methods:** This Descriptive study was done in department of Obstetrics and Gynecology, Holy family hospital, Rawalpindi from 2nd October 2017 to 1st April 2018. We enrolled 222 patients meeting the criteria. Informed consent was taken. **Results:** Mean age was 30.53 ± 4.66 years. Mean gestational age was 38.95 ± 1.38 weeks. Mean parity was 2.28 ± 0.70. Mean gravidity was 2.43 ± 0.89. Amniotic fluid index was found ≤50 mm in 76 (34.23%) and >50 mm in 146 (65.77%). The babies with Apgar score <6 at 1 minute were 43 (56.58%) having mothers with AFI <50mm and 05 (3.42%) with AFI >50mm. **Conclusion:** This study concluded that frequency of Amniotic fluid index < 50mm in term pregnancy is quite high with higher frequency of poor APGAR score in term pregnancy with AFI < 50 mm.

## INTRODUCTION

Amniotic fluid is an essential and vital role in fetal growth, and it varies throughout pregnancy. At 34 week, amniotic fluid concentrations peak at around 800 mL. An increase or decrease in the volume of amniotic fluid causes abnormalities. increase in polyhydramnios, which account for 1% of all pregnancies and usually result in congenital anomalies in one fifth of neonates. Underlying causes of polyhydramnios may be fetal anomalies like esophageal atresia, tracheal agenesis, and duodenal atresia; poorly controlled maternal diabetes mellitus; and chromosomal abnormalities [1]. A decrease in volume results in oligohydramnios, which account for up to 15% of all pregnancies. Oligohydramnios may occur due to renal agenesis and polycystic kidneys. placental insufficiency as seen in pregnancy-induced hypertension, maternal diabetes mellitus, or maternal use of drugs like angiotensin-converting enzyme inhibitors [2]. A definition of isolated oligohydramnios is that it has an amniotic fluid index of <5 cm. Oligohydramnios denotes a weakened state of the fetus. Even a moderate reduction in amniotic fluid

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volume is associated with abnormal FHR and meconium-stained liquor, which frequently necessitate caesarean sections and cause perinatal morbidity and mortality. Oligohydramnios is frequently linked to abnormal fetal outcomes such as IUGR, fetal anomaly, malpresentation, prematurity syndrome, and fetal distress in labor [3, 4]. According to a study of the literature, assessing the amniotic fluid index on USG is not a reliable way for fetal monitoring [5, 6]. Future improvements to our practice and actions in such circumstances will be made possible, thanks to this study. As there is very little local data available so this study's goal was to assess the impact of low AFI on fetal health at birth in order to make local guidelines to provide early management and rapid therapy.

## METHODS

This Descriptive study was done in department of Obstetrics and Gynecology, Holy family hospital, Rawalpindi from 2nd October 2017 to 1st April 2018. The sample size was determined using WHO calculator with 6% error margin having 95% confidence interval and the Anticipated Population is 29.4%,calculated as 222. We included 222 patients meeting criteria of age 20-40 years ,Parity < 5 and Gestational age from 37 to 42 weeks by using non-probability, consecutive Sampling and we excluded congenital abnormalities or IUGR (assessed though USG), CPD (clinical evaluation) and macrocosmic fetus (>4000grams weight) ,Females with multiple gestations (on USG),females with PROM and high risk pregnancies like PIH (BP>140/90mmHg), pre-eclampsia or eclampsia (convulsions with or without pre-eclampsia) or gestational diabetes. Consent was taken and data were recorded. 222 females were added through the gynecology ward of the department of obstetrics and gynecology at the Holy Family Hospital after receiving approval from the hospital ethical council. There was informed consent received. We also acquired demographic information (name, age, and parity). Then, a single senior radiologist from the hospital underwent ultrasonography on female patients to evaluate the AFI(sum of amniotic fluid in each quadrant with largest anteroposterior diameter). Women were divided into low AFI<50mm and typical AFI>50mm categories based on their AFI values. Then, until birth, the ladies were monitored in the ward. Deliveries were performed on all females. Following delivery, the APGAR SCORE was determined and classified as either poor (will be <6 after 1 minute of birth.). All the data were analyzed using SPSS version 22.0. For the data like Poor or normal APGAR score and AFI, frequencies along with percentages were calculated. For continuous variable like age of mother, parity, gravida, means along with standard deviations were calculated. Effect modifiers were controlled through stratification and chi-square test was applied, P value ≤ 0.05 was significant.

## RESULTS

Age ranges from 20 to 40 years with mean age of 30.53 ± 4.66 years. Majority of the patients 119 (53.60%) were between 31 to 40 years of age. Gestational age range in this study was from 37 to 42 weeks with mean gestational age of 38.95 ± 1.38 weeks. Mean parity was 2.28 ± 0.70 as shown in table 1.

| Parameters | Range | Mean ± SD |
|---|---|---|
| Age ( years) | 20 to 40 | 30.53 ± 4.66 |
| Gestational age weeks | 37 to 42 | 38.95 ± 1.38 |
| Parity | 0-2 | 2.28 ± 0.70 |

**Table 1:** Distribution of demographic and clinical characteristics

Mean gravidity was 2.43 ± 0.89.Amniotic fluid index was found ≤50 mm in 76 (34.23%) and >50 mm in 146 (65.77%) as shown in figure1.

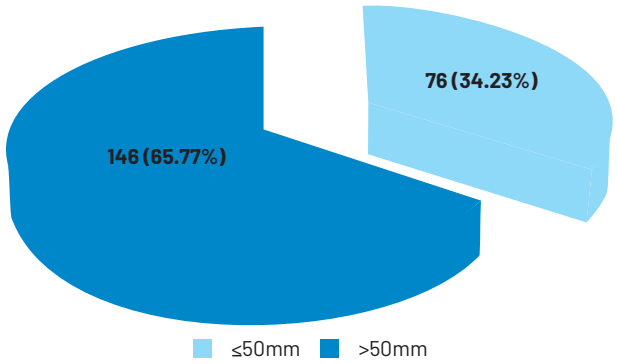


**Figure 1:** Distribution of patients according to amniotic fluid index (n=222)

The babies with Apgar score <6 at 1 minute were 43(56.58%) having mothers with AFI <50mm and 05 (3.42%) with AFI >50mm as shown in table 2.

| AFI | APGAR score | | p-value |
|---|---|---|---|
| | Poor | Good | |
| ≤50 mm | 43(19.3%) | 33(14.8%) | 0.0001 |
| >50 mm | 05(2.2%) | 141(63.5%) | |

**Table 2:** Stratification of poor APGAR score with AFI < 50mm and >50mm (n=222)

## DISCUSSION

A few questions have lately been raised regarding the significance of amniotic fluid volume changes to fetal health and their close relationship to rising perinatal death and morbidity rates. Fetal well-being is a vital question that can, however, go unanswered in many circumstances [7, 8]. The sonographic parameters that are frequently used to calculate the volume of amniotic fluid are AFI and SDP. Both error in that they estimate a three-dimensional parameter from a two-dimensional measurement. Phelan et al, first observed the amniotic fluid index (AFI), a semi quantitative ultrasound assessment used to indicate the volume of amniotic fluid [8]. The fetal position might have a different impact on AFI and SDP since AFI measures the four

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quadrants while SDP just measures the deepest pocket. It is still debatable how accurate SDP and AFI are in comparison. Using invasive techniques, some research have demonstrated the comparability of different measures, while others have demonstrated that one index may be superior to the other [9]. Numerous studies have found that pregnant women with oligohydramnios, which may be detected by ultrasound scanning, are more likely to experience intrapartum fetal discomfort. Although the precise pathophysiology of oligohydramnios is unknown [10, 11]. There are still questions about the typical AFI readings for each gestational age, though. In order to compare the frequency of low APGAR scores in term pregnancy with AFI <50 mm and >50mm, as well as the frequency of amniotic fluid index 50mm in term pregnancy, I did this study. In my study, participants ranged in age from 20 to 40 years. The majority of the 119 patients (53.60%) were between the ages of 31 and 40.The study's range for gestational age was 37 to 42 weeks, with a mean gestational age of 38.95 1.38 weeks. AFI <50mm was seen in 76 (34.23%) cases and 146 (65.77%) were having AFI of >50mm. Similar observation was seen in study by Horsager R et al, who observed AFI< 50mm (29.4%) and AFI >50mm (70%) [12]. Poor APGAR score was found in 48 (21.62%),out of them 43(56.58%) having mothers with AFI <50mm and 05 (3.42%) with AFI >50mm while good APGAR score was observed in 174 (78.38%) with p-value = 0.0001. Simlar findings were also seen in other study by Chamberlain PF et al, where those 75% having Poor APGAR score with mothers of AFI <50mm and 25% with mothers AFI >50mm [13]. In a study by Chate P et al,observed 50 females at term pregnancy with AFI < 50 mm having more intrapartum compilcation ,fetal distrees with poor APGAR in comparison to patients having AF I>50mm with insignificant p value [14]. In one study 83 women were enrolled 11 women with AFI <5 significantly underwent caesarean sections due to fetal distress [15]. Whereas the observation of Pasquini L et al, is not consistent as they observed in study that in pregnancies with oligohydramnios, the modality of delivery and neonatal outcome did not differ from those with normal AFI [16]. In the study by Mushtaq E et al, 146 patients with similar demographic and clinical characteristics like maternal age, parity and mean gestational age were enrolled in two groups with respect to AFI <50mm and AFI>50mm. patient with AFI<50mm was associated with higher rate of induction of labor (68.49% vs. 21.8%, p<0.001), non-reassuring fetal heart rate (45.20% vs. 13.2%, p<0.001), cesarean section for fetal distress (51.61% vs. 28.47%, p<0.001),meconium stained amniotic fluid (32.2% vs. 21.6%, p=0.008). However, there was no statistically significant difference between the two groups in terms of Apgar score at 1 min [17]. After 37 full weeks of gestation, an amniotic fluid index of less than 50mm is a sign of a poor perinatal outcome. Oligohydramnios increases the likelihood of thickened meconium, fetal distress, poor Apgar scores and higher rates of perinatal morbidity. AFI assessment can be done in conjunction with other fetal surveillance techniques. It aids in locating infants with increased risk for poor outcomes. An important tool for identifying fetal distress and making decision for mode of fetal delivery is the determination of AFI [18]. Alfirevic et al. conducted a randomized research to compare the two methods. The frequency was greater among individuals who obtained AFI assessment rather single pocket assessment, these authors said, even if the newborn outcomes were identical in both groups [19]. Magann et al, observed that single pocket measurement is least likely to result in a false positive diagnosis for fetal wellbeing [20]. Therefore, an alternative method of evaluating amniotic fluid using ultrasound may be employed in clinical practice rather than the AFI.

## CONCLUSIONS

This study concluded that frequency of Amniotic fluid index < 50mm in term pregnancy is quite high with higher frequency of low APGAR score in term pregnancy with AFI < 50 mm. So, we recommend that early screening and management of this high risk group.

## Conflicts of Interest

The authors declare no conflict of interest

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Original Article

# Assessment of Knowledge, Attitude and Practices of Oxygen Therapy among Health Care Professionals

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## ABSTRACT

Oxygen is one of the most critical component of life. **Objective:** To access the knowledge attitude and practice regarding oxygen therapy among health care professionals. **Methods:** Cross-sectional study was conducted using purposive sampling technique. A structured questionnaire from literature was used to collect the data. Responses of the participants as good/bad knowledge, positive/negative attitude, and good/bad practice were recorded. The data was collected from Services Hospital Lahore of 140 healthcare professionals. The doctors, RTs, and nurses available at the workplace were included in the study. **Results:** The mean age and standard deviation is 27.09 ± 4.184.There were 61 males representing 43.6% of total population and there were 79 female participants which representing 56.4% of total population. There are 76 doctors which were 54.3% of population, 40 nurses which were 28.6% and 24 respiratory therapists of 17.1% of total population. Our study shows that 77.9% population had good knowledge and remaining 22.1% population had no knowledge, 82.9% population had positive attitude and remaining 17.1% population had negative attitude. And out of 140 participants, 92.9% population had good practice and remaining 7.1% population had bad practice regarding oxygen therapy. **Conclusions:** The study concluded that majority of the studied participant had good level of knowledge about oxygen therapy and adequate level of practice of oxygen therapy but a significant number of participants had average level of knowledge about oxygen therapy and practice of oxygen therapy. Therefore, regular training of healthcare workers should be encouraged to update their knowledge and practice of oxygen therapy.

## INTRODUCTION

Oxygen is one of the most critical component of life [1]. The 21% of oxygen in the atmosphere that is necessary for human body cells to function and survive. Death, organ failure, and cellular malfunction can be brought on by insufficient blood oxygen [2]. Different methods have to access knowledge, attitude and practice of oxygen therapy. Update knowledge is necessary otherwise it will harm the patient. Oxygen therapy is a vital component in the treatment of hypoxic patients and its wrong use can influence patient's condition. The reason for this study is how much medical Service experts in our clinics and how well they practice right utilization of oxygen treatment with universally standard guidelines. There are the holes in medical services supplier preparing and absence of conventions on the most proficient method to screen oxygen use and when to stop it and when and how to give oxygen [3]. High oxygen treatment has been demonstrated to affect the surfactant in the aspiratory alveoli, making the alveolar surface undermine and cause atelectasis. Dry and cold oxygen treatment can evaporate emissions and harm the aviation route mucosal layers, making patients feel drier and awkward [4]. In United States, above than 1.5 million grown-ups are utilizing oxygen treatment to stretch out endurance and to work on their personal satisfaction and for a scope of pneumonic illnesses. There are reports of conflicting suggestive and utilitarian advances from

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oxygen in patients with interstitial lung illness (ILD) and persistent obstructive pneumonic sickness making it trying for clinicians to arrange which patients will acquire advantage from oxygen treatment. Supplemental oxygen is involved by more than 1.5 million people in the United States to upgrade their personal satisfaction and drag out their lives because of a scope of respiratory sicknesses [5]. The high flow nasal cannula (HFNC) treatment was first portrayed as a kind of respiratory help for untimely babies, yet treating intense respiratory disappointment in more seasoned newborn children and children is presently generally utilized. It involves breathing in O2 at a rate higher than the patient's pinnacle inspiratory stream rate through a nasal cannula. The gas is warmed and humidified to match the internal heat levels, clearing the nasopharyngeal dead space, producing mucociliary clearance, positive pressure, and, subsequently, a decrease in breathing work [6]. If more than fifty percent concentrations of oxygen are administered for a long time, there may occur O2 toxicity. Health care professionals should not appear to use oxygen therapy experimentally without having sufficient knowledge of dosage, indication, side effects, and intoxication [7]. Patients with ongoing obstructive lung illness and restlessness, extreme hypoxemia benefit from long term home oxygen therapy. This benefit might apply to those with other constant pneumonic circumstances. Patients with long lasting obstructive lung infection are the probably going to require long term oxygen treatment (COPD) [8]. In the treatment of hypoxemic acute respiratory failure, oxygen therapy is the first-line treatment (ARF). Throughout the course of recent many years, different oxygen gadgets have opened up, including low-flow oxygen devices (nasal cannula, straightforward facemask, non-rebreathing repository veil) and high-oxygen devices (Venturi cover). The seriousness of the hypoxemia, the basic systems, and the patient's breathing example and resilience all impact the choice of a particular gadget in the administration of ARF. Basically, sick patients often times require high-stream oxygen gadgets to meet their oxygen requirements [9]. A typical pharmacologic treatment for COPD is long term oxygen therapy (LTOT). Locally situated LTOT has been displayed to further develop endurance in patients with COPD and extreme resting hypoxemia. During action and exercise, oxygen treatment has been displayed to alleviate side effects and keep up with blood vessel oxygen immersion, yet not to work on long term results. In COPD intensifications, oxygen treatment can be both useful and unsafe. For doctors composing medicines, study clinical gear providers, guardians, and patients, LTOT innovation presents a challenge [10]. For providing and monitoring home oxygen treatment, a variety of equipment are available [11]. In children with persistent respiratory problems, home oxygen treatment is frequently necessary [12]. For powerful conveyance of home oxygen treatment to proper patients with persistent obstructive aspiratory sickness (COPD) and interstitial lung infection, proof-based rules are required (ILD) [13]. Constant respiratory disappointment (CRF) is a late-stage component of a few ongoing lung sicknesses, including persistent obstructive pneumonic illness (COPD), aspiratory fibrosis, and cellular breakdown in the lungs, yet it is likewise found in various heart and neuromuscular circumstances. Constant respiratory disappointment is characterized by an ongoing powerlessness to become soaked with O2, bringing about extreme dyspnea, particularly during exercise. Besides, patients who habitually depend on fixed or weighty cylinders seem to battle to stick to the utilization of LTOT for 15 hours out of each day and, thus, have a lower personal satisfaction. Patients in a Dutch report referred to "limited independence" and "feeling embarrassed" as purposes behind rebelliousness, notwithstanding secondary effects straight forwardly connected with the utilization of the gadgets. To resolve these issues, more versatile gadgets like fluid O2 holders and, specifically, little battery-controlled oxygen concentrators have been created lately. These gadgets have been displayed to give oxygen supplementation practically identical to heavier cylinders, further developing execution in the 6-minute strolling test as well as immersion and shortness of breath when contrasted with patients breathing air [14]. A report was conducted in 2021 by Hussein Kadhim and Juma AL-Rudha on the assessment of nurses' knowledge toward oxygen therapy administration for patients with COVID-19 at the Intensive Care Unit and Isolation Unit in AL-Hussein Teaching Hospital in AL-Smawa City, Iraq. Non probability convinient sampling technique was used. There was a sample size of 50 participants. Self-designed questionnaire was used to collect data. The study concluded that the knowledge of nurses' was poor knowledge; also there is no relationship between knowledge regarding oxygen therapy for patients with covid-19 and age and educational level [15]. In 2021, descriptive research was conducted by Ashwaq Yassin and Khalida Mansour under the title Assessment of Nurses' Knowledge and Practice Regarding Oxygen Therapy at Teaching Hospitals in Al-Nasiriya City, Iraq". A purposive sampling technique was used. A self-structured questionnaire was used for data collection. The questionnaire was divided into three sections: section 1 had twelve items; section 2 had five domains; and section 3 had twenty-six items. According to the study conclusion, nurses' knowledge and practices regarding oxygen therapy were inadequate [16].

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## METHODS

To access the knowledge attitude and practice regarding oxygen therapy among health care professionals. Cross-sectional study was conducted by using purposive sampling technique. The data was collected from Services Hospital Lahore. A structured questionnaire from previous literature was used to collect the data [17]. There was Sample size of 140 patients which was calculated on the basis of prevalence. The doctors, RTs, and nurses available at the workplace were included in the study. Nurses who will not be directly involved in bedside patient care such as nurse supervisor will be omitted from the study. The questionnaire was based on the previous studies and expert opinion. In our questionnaire attitude section was contain seven questions, knowledge contain six and practice section was contain seven questions. Approval was obtained from the University of Lahore. Permission was obtained from the Services hospital Lahore. Participants were interviewed with the help of questionnaire. The data collected was first transferred to SPSS spreadsheet. Statistical analysis was done using SPSS version 24.0 package. The frequency and percentage analysis were used to measure the good and bad knowledge and others variables. Knowledge score <50% were considered as poor or no knowledge, 50-75% score were considered as moderate knowledge, >75% score were considered as good knowledge. A positive score indicates a positive attitude, while negative and zero scores indicate negative attitudes. A practice score of >80% was considered as good practice and <50% was considered as inadequate practice.

## RESULTS

Table 1 shows that the mean age of participants is 27.09 and standard deviation is 4.184. In this study there were 61 males representing 43.6% of total population and there were 79 female participants which representing 56.4% of total population. There are 76 doctors which were 54.3 in population, 40 nurses which were 28.6% and 24 respiratory therapists of 17.1% of total population.

| Age | N=140 |
|---|---|
| Mean | 27.09 |
| Standard Deviation | 4.184 |
| **Gender** | **N (%)** |
| Male | 16(80) |
| Female | 44(67.6) |
| Total | |
| **Profession** | |
| Doctor | 76 (54.3%) |
| Nurses | 40 (28.6%) |
| Respiratory Therapist | 24 (17.1%) |
| Total | 140 (100.0%) |

**Table 1:** Frequency and percentages of Demographic Variables

Table 2 study shows that 77.9% population had good knowledge and remaining 22.1% population had no knowledge, 82.9% population had positive attitude and remaining 17.1% population had negative attitude. And out of 140 participants, 92.9% population had good practice and remaining 7.1% population had bad practice regarding oxygen therapy.

| (Total score of knowledge Category) Response | N (%) |
|---|---|
| Good knowledge | 109 (77.9%) |
| Bad knowledge | 31 (22.1%) |
| Total | 140 (100%) |
| **(Total score of attitude Category) Response** | |
| Positive attitude | 116 (82.9%) |
| Negative attitude | 24 (17.1%) |
| Total | 140 (100.0%) |
| **(Total score of practice Category) Response** | |
| Good practice | 130 (92.9%) |
| Bad practice | 10 (7.1%) |
| Total | 140 (100.0%) |

**Table 2:** Frequency and percentages of total score of knowledge attitude and practice category

There were 115 participants, of which 82.1% received oxygen therapy in an emergency situation ordered by a medical professional, and 26 participants, of whom 17.9% did not receive oxygen therapy in an emergency situation ordered by a medical professional. There were 103 participants considered to have oral and nasal hygiene that should be done with oxygen therapy, while 37 participants were not considered to have oral and nasal hygiene that is necessary during oxygen therapy. There were 97 participants, or 69.3%, who considered continuous O2 administration more beneficial, while 43 participants, or 30.7 %, did not consider continuous O2 administration beneficial. There are 133 participants who consider humidification the best practice to prevent dryness of the mucous membrane of the upper respiratory tract, and 7 participants do not consider humidification the best practice to prevent dryness of the mucous membrane of the upper respiratory tract. There are 131 participants (93.6%) who considered the prescribed $SpO_2$ range maintained in severe lung disease, while 9 participants (6.4%) did not consider the prescribed $SpO_2$ range maintained in severe lung disease. There were 26 participants, or 18.6% of the total population, who considered the administration of $O_2$ to patients very dangerous, while 114 participants, or 81% of the population, considered the administration of $O_2$ to patients safe. There were 23 participants, or 16.6% of the total population, who were considered to believe that the oxygen therapy indicates that the patient is at the end stage of life, and 117 participants, or 83.4 % of the total population, were considered to believe that the oxygen therapy is not an indication that the patient is at the end stage of life. There

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were 133 participants, or 95.0 percent of the total population, considered to assess oxygen saturation during administration, and 7 participants, or 5.0% of the population, were considered to not assess oxygen saturation during administration. There were 136 participants, or 97.1% of the total population, who were considered to check the device before oxygen administration, and 3 participants, or 2.1% of the total population, were not considered to check the device before oxygen administration. There were 135 participants, or 96.4% of the total population, considered to have collected all the necessary equipment before administration, while 5 participants, or 3.6% of the total population, are not considered to have collected all the necessary equipment before oxygen administration. There were 136 participants, or 97.1% of the total population, who considered adjusting the flow rate appropriately during administration, compared with 4 participants, or 2.9 % of the total population, who did not consider adjusting the flow rate appropriately during oxygen administration. There were 136 participants, or 97.1% of the total population, who thought using an appropriate device size and method was important during oxygen therapy, while 4 participants, or 2.9 % of the total population, did not consider using an appropriate device size and method during oxygen therapy. There were 135 participants, or 94.1 percent of the total population, considered to follow patients' vital signs during administration, while 5 participants, or 3.6 percent of the total population, were considered not to follow patients' vital signs during administration. There were 59 participants, or 42.1% of the total population, who considered oxygen like other medicines, while 81 participants, or 57.1% of the total population, did not consider oxygen like other medicines. There are 130 participants, or 92.9 percent of the total population, who believe hypoxia can be detected through clinical signs, while 10 participants, or 7.1% of the total population, do not believe hypoxia can be detected through clinical signs. There were 134 participants, representing 95.7% of the total population, who considered blood gas analysis useful for confirming hypoxemia, while there were 6 participants, or 4.3% of the total population, who did not consider blood gas analysis useful for confirming hypoxemia. There were 102 participants, or 72.9 percent of the total population, who considered central cyanosis an indication for acute oxygen therapy, while 38 participants, or 27.1% of the total population, did not consider central cyanosis an indication for acute oxygen therapy. There were 59 participants, or 42.1% of the total population, who considered asymptomatic anemia an indication for acute oxygen therapy, and 81 participants, or 57.1% of the total population, who did not consider asymptomatic anemia an indication for acute oxygen therapy. There are 92 participants, or 65.7% of the total population, who consider restlessness and convulsions in children to be indications for acute oxygen therapy, while 48 participants, or 34.3% of the total population, do not consider restlessness and convulsions in children to be indications for acute oxygen therapy.

| Questions About Knowledge | Good Knowledge | No knowledge |
|---|---|---|
| Oxygen is like any other medication? | 58(41.4%) | 82(58.6%) |
| Hypoxemia can be recognized by clinical signs | 130(92.9%) | 10(7.1%) |
| Blood Gas Analysis is useful for confirming hypoxemia | 134(95.7%) | 6(4.3%) |
| Central cyanosis is an indication for acute oxygen therapy | 102(72.9%) | 38(27.1%) |
| Asymptomatic anemia is an indication for acute oxygen therapy | 59(42.1%) | 81(57.9%) |
| Restlessness and convulsion in children are indications for acute oxygen therapy | 92(65.7%) | 48(34.3%) |
| **Questions About Attitude** | **Positive Attitude** | **Negative attitude** |
| 02 is given only when ordered by a medical professional, or a registered nurse-initiated order in an emergency situation. | 112(80.0%) | 28(20.0%) |
| Oral and nasal hygiene and normal saline drops as necessary should be done when giving OT | 103(73.65) | 37(26.4%) |
| Continuous 02 administration is more beneficial than intermittent OT | 97(69.3%) | 43(30.7%) |
| Humidification is the best practice to prevent dryness of mucus membrane of upper respiratory tract | 133(95.0%) | 7(5.0%) |
| Persons with severe lung disease need to be maintained at the prescribed Sp02 range | 131(93.6%) | 9(6.4%) |
| Administration of 02 to patients is not safe and it is very Dangerous | 24(17.1%) | 116(82.9%) |
| A patient on OT indicates that the patient is at the end stage of life | 20(14.3%) | 120(85.7%) |
| **Questions About Practice** | **Good Practice** | **Bad practice** |
| Assess oxygen saturation before administration | 102(72.9%) | 38(27.1%) |
| Assess oxygen saturation during administration | 111(79.3%) | 29(20.7%) |
| Check the device before administration | 114(81.4%) | 26(18.6%) |
| Collect all necessary equipment before administration | 113(80.7%) | 27(19.3%) |
| Adjust flow rate appropriately during administration | 116(82.9%) | 24(17.1%) |
| Use appropriate device size and way | 116(82.9%) | 24(17.1%) |
| Follow patients' vital signs during administration | 112(80.0%) | 28(20.0%) |

**Table 3:** Frequency and percentages of Responses to knowledge, Attitude and practice questions by Health Care Professionals

## DISCUSSION

In contrast pervious study conducted in 2022 at South Gondar zone hospitals. The title of study is Knowledge, attitude, and practice of health professionals for oxygen therapy. The results of the contrast study were shows that participant's responses for the knowledge questions range from a maximum score of 93.1% to a minimum score of

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33.5% from all questions. The most correctly answered question was indications of oxygen therapy followed by conditions that affect the pulse-oximetry reading. The least answered question was components of arterial blood gas analysis measures to detect respiratory problems. The result of our study shows that knowledge was assessed by six questions. The results of study shows that there are 140 participants, which show 77.9% population had good knowledge and remaining 22.1% population had no knowledge [18]. In contrast pervious study conducted in 2019 by Amairah Fahad Aloushan et al shows that 324 participants (72.9%) show positive attitude and 75(16.9%) participants shows negative attitude regarding oxygen therapy in emergency situation ordered by a medical professional. The results of this study shows that 112(80.0%) participants show positive attitude when oxygen therapy in emergency situation ordered by a medical professional & 28 participants which were in 20.0% shows negative attitude when oxygen therapy in emergency situation ordered by a medical professional [16]. In contrast pervious study 69.8% was positive and 9.3 participants were negative attitude regarding oral and nasal hygiene should be done with oxygen therapy. In contrast pervious study 27.0%particpnats show positive and 38.3% have negative attitude related to continuous 02 administration beneficial than intermitted oxygen therapy. The results of current study show 103(73.6%) participants shows positive attitude and 37(26.4%) participants have negative attitude regarding oral and nasal hygiene should be done with oxygen therapy [19]. In contrast pervious, cross-sectional study conducted in 2021, on "Nurses' Supplemental Oxygen Therapy Knowledge and Practice in Debre Tabor General Hospital" by Shegaw Zeleke and Demewoz Kefale. The result of that study was 30.5% participants have good practice and 69.5% have poor practice regarding device check before oxygen therapy administration. The results of current study shows that 81.4% participants have good practice and they check the device before oxygen therapy administration [20]

## CONCLUSIONS

The result of the study concluded that majority of the studied participant had good level of knowledge about oxygen therapy and adequate level of practice of oxygen therapy but a significant number of participants had average level of knowledge about oxygen therapy and practice of oxygen therapy. Therefore, regular training of healthcare workers should be encouraged to update their knowledge and practice of oxygen therapy.

## Conflicts of Interest

The authors declare no conflict of interest

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**Original Article**

# Association Between Postponements of Medical Care and Financial Constraints Among Transgender Population

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## ABSTRACT

Health is a basic human need and access to healthcare is a basic non-negotiable human right. **Objectives:** To examine the association between postponements of medical care and financial constraints that might lead to delay in their medical care. **Methods:** We conducted a primary, analytical cross-sectional study including transgender individuals (n=250), using a purposive sampling technique who were registered with the Gender Interactive Alliance (G.I.A) a non-governmental organization (NGO) in Karachi, Pakistan. We assessed their demographic data by documenting age, gender, religion, income and province, in relation to access to medical care. **Results:** Data were obtained from 204 (81.6%) males and 46 (18.4%) females' transgenders. The mean age was 32.34 years (S.D=7.85). A Significant association was found in postponement of medical care and financial constraints, with educational status which showed that more than half (55%) were Non Matriculated (p-Value= 0.001), gross monthly income (before taxes) were between 21000 to 30000 PKR (p = 0.002) per month and half of the population were homeless (p <0.001) and it has significantly decreased their chances of access to medical care. **Conclusion:** Significant association found between postponements of medical care and to financial constraints in transgender population. Further studies are needed to shed light on the struggles that transgenders face in medical care and to find out the solution to help those neglected individuals/section of society.

## INTRODUCTION

Health is a basic human need and access to healthcare is a basic non-negotiable human right. One of the determinants of health is socioeconomic status of the individual, and although it is a modifiable risk factor, it is still a factor that may obstruct the delivery of care, making the afflicted more vulnerable to deterioration, that is one of the fast growing challenge for the new generation which can be worst for their own selves and as well as for the community health by transmitting the contagious diseases from the infected individuals to the healthy population and this also could lead to disability in case of non-communicable disease. These can happen due to poor state health policy, financial bottlenecks, huge discrimination, old age population and increase in the levels of chronic diseases. It is now mandatory to overcome the health care issues to improve socioeconomic status. Furthermore, postponement of needed medical care that delay to identify initial diagnosis, while late identification of the diagnosis is also associated with a huge loss of employment, low socioeconomic status and bad effect on mental health. The Primary Health Care which was set as the global priority of its function; to provide the basic

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health intervention discussed in 1978 Alma-Ata declaration that was health for all, which means provision of health without any discrimination. But, unfortunately PHC is still not active in low and in Middle income countries. Pakistan lacks international standards and minimum measures behind the sustainable developmental goal (SDG), the poor health outcome that is due to increased flow of patients in the hospitals and institutional corruption. Pakistan has been recorded by the most corrupt (116$^{th}$) country out of 176 in the world by the World Bank in international transparency record in 2016; it has been found that corruption is directly associated with poverty which has a negative impact on the health of poor income population [1-6]. The transgender population is significantly postponed needed medical care which is due to non-affordability. Thus the transgender population is facing big issues which are unemployment, and 36% of those who were employed whose monthly income was relatively low, reported suicidal attempts due to discrimination and low monthly income. Transgender women are paying huge financial cost for their needed medical treatment as compared to transgender men due to comparatively lower income [7-9]. The lower income plays an important role as a health barrier in the form of the prevention of screening test and other health care related checkup because the transgender population is also found affected by communicable diseases i.e. HIV and so on. Such positive patients are very vulnerable and pose a threat to the healthy population. Furthermore, various determinants of health including inequality in provision of health care, health insurance policy, employment status and public policy or lack of awareness among health care providers on transgender population related to the health issues. Moreover, it has been found that health insurance status and treatment cost directly effect on the health outcome [10-12]. Pakistan is a lower middle income country, a cross-sectional study found that those having low socioeconomic status had bad effect on their health and educational system i.e. malnourishment, poor diet, and lack of education. Another study found in kpk and Punjab with positive association between head and neck cancer patients and low socioeconomic status, thus it implies a psychological stress. According to UNDP, Pakistan is the 5$^{th}$ largest young country, while facing great challenges of unemployment and illiteracy rate, 68% of population is below 30 years of age but facing great challenges, but unfortunately 62.3% of the population cannot read and write [13-15]. It has been found that with income status seventy percent (70%) of the transgender population face poor quality of health care. Another study conducted in the Latin America showed that eight percent of the world population faces violence and inequality [16, 17]. The above mentioned reports found worldwide about inequalities in access of health care treatment related to socioeconomic status. Therefore, the authors had decided to conduct the below analytical cross-sectional study in Karachi Pakistan. The aim of this study was to examine whether economic and educational status had an impact on the postponement of medical care or not.

## METHODS

Analytical cross-sectional study was conducted, using purposive sampling technique. Data collected via questionnaire from 250 transgender participants, after a formal permission from Gender Interactive Alliance (G.I.A) a non-governmental organization (NGO) in Karachi, Pakistan from February, 2020 to May, 2020. Below 18 years of age and mentally retarded individuals were excluded from the study. The study followed strict ethical guidelines and received ethical approval (REC Ref No.Sc/EPH/S17-01) Dadabhoy Institute of Higher Education (DIHE) Karachi Pakistan. Data were analyzed on SPSS (version 21.0). We assessed the demographic data for the frequency distribution, mean and standard deviation. Furthermore, we applied the Chi-square test to examine the association between postponements of medical care and financial constraints.

## RESULT

Table 1 showed that 250 transgender respondents participated with the mean age of 32.34 years (S.D=7.85). Based on their gender 204 (81.6%) males and 46 (18.4%) females' transgenders reported. Furthermore, based on their religion, 86.8% found Muslim; whereas 7.6% were Christian and 5.6% were Hindu. Moreover, 10.8% were Baloch, 15.2% were Pashtun, 24.8% were Punjabi, 24.8% were Sindhi, 21.6% were Muhajir (Urdu speaker), and 2.8% were others as identified by their ethnicity status of the participants. More than half (60.4%) of the participants belonged to the Sindh region, 18.0% were from Punjab, 13.6% from KPK, and 8.0% from Baluchistan province. Based on the educational and financial status, most of the Participants educational level (42.8%) was primary, whereas 18.4% had middle school education, 20.4% had matriculation experience, 6.4% had intermediate education, 3.2% had a Bachelor's Degree, 0.8% had a Master's Degree, 0.8% had a Professional degree, and 7.2% were uneducated. The monthly income identified as, 2.0% earning less than 10000 PKR, whereas 14.0% earned between 11000 to 20000 PKR, 34.4% earned between 21000 to 30000 PKR, 38.8% earned between 31000 to 40000 PKR, 10.4% earned between 41000 to 50000 PKR, and 0.4% earned between 51000 to 60000 PKR. Regarding the participants living status, half (50.0%) were homeless, 33.6% were living in a shelter, 2.0% were living in university housing, 4.4% were still living with their parents, and 10.0%

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were staying with friends temporarily.

| | Demographic characteristics | |
|---|---|---|
| 1 | Mean age of the respondents in years | 32.34+7.858 |
| 2 | **What is your current Gender** | |
| | Transgender Man | 204 (81.6%) |
| | Transgender Woman | 46 (18.4%) |
| 3 | **Religion of the participants** | |
| | Muslim | 217 (86.8%) |
| | Christian | 19 (7.6%) |
| | Hindu | 14 (5.6%) |
| 4 | **Race / Ethnicity of the participants** | |
| | Baloch | 27 (10.8%) |
| | Pashtun | 38 (15.2%) |
| | Panjabi | 62 (24.8%) |
| | Sindhi | 62 (24.8%) |
| | Muhajir (Urdu Speaker) | 54 (21.6%) |
| | Others | 7 (2.8%) |
| 5 | **Province of the participants** | |
| | Baluchistan | 20 (8.0%) |
| | KPK | 34 (13.6%) |
| | Punjab | 45 (18.0%) |
| | Sindh | 151 (60.4%) |
| 6 | **Highest Degree or Level of education** | |
| | Primary | 107 (42.8%) |
| | Middle | 46 (18.4%) |
| | Matriculation | 51 (20.4%) |
| | Intermediate | 16 (6.4%) |
| | Bachelor Degree | 8 (3.2%) |
| | Master Degree | 2 (0.8%) |
| | Professional Degree (MBBS, DVM,LLB) | 2 (0.8%) |
| | Uneducated | 18 (7.2%) |
| 7 | **Current gross monthly household income (before taxes)** | |
| | Less than 10000 PKR | 5 (2.0%) |
| | 11000 to 20000 PKR | 35 (14.0%) |
| | 21000 to 30000 PKR | 86 (34.4%) |
| | 31000 to 40000 PKR | 97 (38.8%) |
| | 41000 to 50000 PKR | 26 (10.4%) |
| | 51000 to 60000 PKR | 1 (0.4%) |
| 8 | **Current living arrangement** | |
| | Homelessness | 125 (50.0%) |
| | Living in a shelter | 84 (33.6%) |
| | Living in a campus or university housing | 5 (2.0%) |
| | Still living with parents or family you grew up with | 11 (4.4%) |
| | Staying with friends or family temporally | 25 (10.0%) |

**Table 1:** Demographic characteristics of transgender

Analysis of the Chi square result showed (Table 2) that transgender respondents who belonged from the Sindh province of the country ($p < 0.001$) has significantly postponed or not to get medical care. Furthermore, 55% (17.5% had Primary, 37.5% Middle) had the education below matriculation ($p = 0.001$). Moreover, monthly income of the participants had between 21000 to 30000 PKR ($p = 0.002$). Finally, half (50%) of the transgender population had homeless and postponed or not to get medical care, because they couldn't afford ($p < 0.001$).

| | Name of the Variable | Postponed or not tried to get medical care when I was sick or injured because I didn't afford it. | | p-Value |
|---|---|---|---|---|
| | | Yes | No | |
| 1 | **What is your current gender identity** | | | |
| | Transgender Man | 37 (92.5%) | 167 (79.5%) | 0.052 |
| | Transgender Woman | 3 (7.5%) | 43(20.5%) | |
| 2 | **What is your religion** | | | |
| | Muslim | 33 (82.5%) | 184 (87.6%) | 0.441 |
| | Christian | 5 (12.5%) | 14 (6.7%) | |
| | Hindu | 2 (5%) | 12 (5.7%) | |
| 3 | **What is your race/ethnicity?** | | | |
| | Baloch | 4 (10%) | 23 (11%) | 0.752 |
| | Pashtun | 6 (15%) | 32 (15.2%) | |
| | Panjabi | 13 (32.5%) | 49 (23.3%) | |
| | Sindhi | 9 (22.5%) | 53 (25.2%) | |
| | Muhajir (Urdu Speaker) | 8 (20%) | 46 (21.9%) | |
| | Others | 0 (0%) | 7 (3.3%) | |
| 4 | **Which of the following is your province?** | | | |
| | Baluchistan | 0 (0%) | 20 (9.5%) | <0.001 |
| | KPK | 2 (5%) | 32 (15.2%) | |
| | Punjab | 1 (2.5%) | 44 (21%) | |
| | Sindh | 37 (92.5%) | 114 (54.3%) | |
| 5 | **What is the highest degree or level of education you have completed?** | | | |
| | Primary | 7 (17.5%) | 100 (47.6%) | 0.001 |
| | Middle | 15 (37.5%) | 31 (14.8%) | |
| | Matriculation | 14 (35.0%) | 37 (17.6%) | |
| | Intermediate | 2(5.0%) | 14 (6.7%) | |
| | Bachlor Degree | 0 (0.0%) | 8 (3.8%) | |
| | Master Degree | 0 (0.0%) | 2 (1.0%) | |
| | Professional degree | 0 (0.0%) | 2 (1.0%) | |
| | Uneducated | 2 (5.0%) | 16 (7.6%) | |
| 6 | **What is your gross monthly income in PKR (Before Taxes)?** | | | |
| | Less than 10000 PKR | 0 (0.0%) | 5 (2.4%) | 0.002 |
| | 11000 to 20000 PKR | 6 (15.0%) | 29 (13.8%) | |
| | 21000 to 30000 PKR | 25 (62.5%) | 61 (29.0%) | |
| | 31000 to 40000 PKR | 8 (20.0%) | 89 (42.4%) | |
| | 41000 to 50000 PKR | 1 (2.5%) | 25 (11.9%) | |
| | 51000 to 60000 PKR | 0 (0.0%) | 1 (0.5%) | |
| 7 | **What is your current living arrangements?** | | | |
| | Homeless | 20 (50%) | 105 (50%) | <0.001 |
| | Living in a shelter | 8 (20%) | 76 (36.2%) | |
| | Living in campus or university housing | 1 (2.5%) | 4 (1.9%) | |
| | Still living with parents or family you grew up | 8 (20%) | 3 (1.4%) | |
| | Staying with friends or family or temporarily | 3 (7.5%) | 22 (10.5%) | |

**Table 2:** Analysis of the Chi square result

## DISCUSSION

In the present study, we examined the association between financial constraints and postponements of needed medical care. Half (50%) of them who had an education

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below matriculation(17.5% had Primary, 37.5% Middle)were significantly more likely to postponed or not to get needed medical care because they couldn't afford it ($X^2$ p= 0.001). Furthermore, based on monthly income, more than half (62.5%) of the study population gross monthly income had between 21000 to 30000 rupees before income taxes ($X^2$ p= 0.002), were significantly more likely postponed needed medical care. Moreover, similarly a previous study has reported that financial barrier is the main factor of postponement of medical care among transgender population. Whereas, another study reported that the socioeconomic factor such as education, parental education and income has a significant effect on brain cognitive [16, 17]. In addition to that, another study has been found in which low income population is significantly associated in postponement of needed medical care because low income population cannot afford needed medical care, therefore they face more complication and low recovery from the diseases. While in the previous research study similarly report found that 51% of the transgender population reported with low socioeconomic status. Delayed in needed medical care found a very significantly association between those populations who were facing financial issue. Finally, another previous study showed a positive association between low income and educational status and postponement of medical treatment among cancer patients [18-20].

## CONCLUSIONS

The current study suggests a significant association between postponements of medical care and financial constraints. Immense need of increasing educational and employment status, making strong policy and ensuring early diagnosis and cure by applying an efficient surveillance system. Further studies are needed to shed light on the struggles.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Bacteriological Profile and Antibiotic Susceptibility Pattern of Isolates in Neonatal Sepsis

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## ABSTRACT

Sepsis in newborns is a serious medical condition having a high mortality. Pakistan and other developing countries have a high burden of neonatal sepsis. **Objectives:** To determine the bacterial spectrum and antibiotic activity pattern in neonatal sepsis. **Methods:** This retrospective cross-sectional research was performed at the Pediatrics Unit of Ziauddin University Hospital Karachi from 1st June 2022 till 1st December 2022. A total of 120 medical records of neonates admitted with the clinical suspicion of sepsis were reviewed. Non-probability convenience sampling technique was used. Data regarding clinical characteristics of neonates, type of bacteria isolated and antibiotic susceptibility results were recorded. SPSS version 20 was used for statistical analysis. The results were written as frequencies / percentages. **Results:** Neonatal sepsis was suspected in 120 newborns but blood culture-proven infection was present in 32 (13.3%) neonates with 23(71.8%) having early -onset sepsis. The mean age on admission was 7.61±3.61 days. Acinetobacter was the commonest bacteria implicated in sepsis followed by Klebsiella ,Burkholderia and Serratia. The mortality rate in study population was 8.3%.Mortality was highest in Klebsiella sepsis. None of the bacterial species were sensitive to ampicillin while Acinetobacter and Burkholderia species responded to colistin ,polymyxin and meropenem but showed resistance to imipenem. **Conclusion:** Early-onset neonatal sepsis has a high prevalence especially with gram -negative bacteria. Antimicrobial resistance to first line empiric therapy is common.

## INTRODUCTION

Neonatal sepsis is a medical disorder which typically has an early presentation in life. It shows specific clinical manifestations and is recognized as one of the prime reasons of illness and death in newborns worldwide [1]. Sepsis in the first month of life is grouped as early onset sepsis (EOS) if occurring before 72 hours of life and late onset sepsis (LOS) if after. EOS is caused mainly by bacterial organisms acquired intrauterine and at birth from the maternal reproductive tract whereas late onset sepsis results from infection acquired after birth from the home or hospital environment. It is challenging to confirm sepsis in newborns on the basis of mere clinical presentation as clinical signs can be generalized and non-specific. It is defined clinically or bacteriologically, either by positive blood or body fluid culture. Despite the advancement in medical management of infections in newborn , blood culture is still the mainstay of investigation [2]. World Health Organization (WHO) has reported that throughout the world , the annual death rate in newborns is 1.6 million and 40% of these happen in growing countries [3]. In Pakistan, sepsis is the principal contributor of an extremely high neonatal mortality rate, attributing to 17.2% of newborn deaths [4]. The type of pathogens causing neonatal sepsis exhibits dissimilarity in not only different countries but even within medical facilities as particular bacteria transition and exhibit variability in occurrence. Developing countries have sepsis caused predominantly by gram-negative organisms such as Klebsiella pneumoniae and Escherichia coli , whereas in high income countries Group B streptococci and other gram-positive bacteria

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predominantly cause neonatal infection [5].Therefore, the bacteriological profile varies significantly based on the geographical location. The bacterial isolates causing infection in newborns shows variation from time to time in the same setting. A majority of neonatal deaths can be prevented by early institution of suitable antibiotics according to the local sensitivity pattern [6]. In this era of widespread antibiotic use , multi-drug resistant (MDR) organisms are a constant challenge to treat especially in low and middle income set up. Bacteria implicated in late onset sepsis have been observed to be resistant to antibiotics to a greater extent as compared to those producing early-onset sepsis [7]. Nosocomial infection is acquired during hospitalization and is contracted by a patient at least 48 hours after being admitted. In developing countries Burkholderia cepacian ,Acinetobacter baumannii, Klebsiella pneumoniae , Pseudomonas aeruginosa and Serratia marcescens have been found to be implicated in a majority of these infections. Insensitivity to antibiotics is defined as development of unresponsiveness to at least one or more antimicrobial medications as per recommendations [8]. Development of clinical guidelines for judicious use of antimicrobials is imperative. Unresponsiveness of microorganisms to penicillin and third generation cephalosporins suggests the need to re-assess guidance for empiric treatment in infected newborns. Hospital policies to limit spread of disease and training of medical staff regarding the importance of measures such as frequent hand sanitization needs to be emphasized. It has been observed , that in the past decade or so resistance to ampicillin and aminoglycosides has emerged as evidenced by research data, therefore it is important that treatment should be administered according to the local sensitivity pattern and correct dose and duration of antibiotics given [9]. This study was thus , conducted with the aim of determining the pattern of various bacteria and their responsiveness to antimicrobials in sepsis during neonatal period and in the conditions prevailing locally. It emphasizes the need for identifying the culture and drug susceptibility pattern of locally prevalent microorganisms , judicious use of empiric therapy and the requirement for constant surveillance.

## METHODS

This cross-sectional retrospective took place at Pediatric Unit of Ziauddin University , Karachi for six months i.e. 1st June 2022 till 1st December 2022. Medical records of All neonates admitted with suspected sepsis ,and also those with a positive blood culture result were included. Electronic medical records were accessed and data recorded. Newborns with congenital malformations , laboratory evidence of inborn error of metabolism and those with a history of perinatal hypoxic insult were excluded to control effect modifiers and bias in results. Data was recorded on a pre-designed structured proforma by two pediatric residents and it was pilot tested for clarity. For sample size estimation , WHO sample size calculator with confidence level taken as 95% and desired precision as 6% and approximate population estimation (frequency of neonatal sepsis as 13% from research studies ) , the largest sample size calculated was 120 cases. Approval from the Ethical review committee was sought ( reference code : 5870822RMPED). Blood samples of approximately 5 ml of venous blood was drawn from the neonates using aseptic technique and injected into BACTEC® PEDS Plus (Becton Dickinson, Towson, MD) culture media bottle after ensuring aseptic measures. In the laboratory , BACTEC 9050 automated blood culture instrument was added to BACTEC bottle, using fluorescent technology. The positive vials were cultured on special media by inoculating the culture broth on blood, chocolate and MacConkey agar plates. These were then incubated in an incubator at 37°C in a chocolate plate. The culture vials were observed daily for bacterial growth. The pure bacterial isolates are obtained using subculture technique and later the organisms are identified using standard microbiological methods such as studies of colony morphology, Gram-staining and biochemical characteristics (triple sugar iron, catalase, urease, citrate ,oxidase coagulase tests). Blood culture bottles wherein there was no evidence of any bacterial growth after 5 days of incubation (growth on MacConkey/blood agar) were labelled as negative after a verifying subculture. Antimicrobial sensitivity was tested using Muller Hinton Agar by the Kirby Bauer Disc diffusion technique according to Clinical Laboratory Standards Institute (CLSI ) guidelines 2017. Antibiotic discs containing ampicillin, aztreonam, carbapenems ,ceftazidime, ceftriaxone, ciprofloxacin, clindamycin, colistin, co-trimoxazole, gentamicin, ceftazidime, clindamycin, colistin , levofloxacin , piperacillin/tazobactam , polymyxin, teicoplanin, vancomycin was obtained and used according to the manufacturer's instructions. The zone of inhibition was decided employing the CLSI recommendations , and the antibiotics were marked accordingly as “sensitive“, “intermediate“ or “resistance“ [10]. For admitted newborns ,history findings and thorough physical examination were recorded. Data were recorded with regards to gestational age , gender ,weight ,type of sepsis ,mode of delivery , blood culture and antibiotic sensitivity result. Analyses of data was done through SPSS version 20.0. Mean and standard deviation were used to denote continuous variables. Measurement data that was qualitative was expressed as frequencies and percentages. Effect

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modifiers were controlled through stratification of data to see the effects of these outcome variables using chi-square and p-value was considered significant if <0.05'

## RESULTS

Out of a total of 240 neonates were admitted during the study period , in 120 neonates there was a clinical suspicion of sepsis but only 32 neonates had a positive blood culture result i.e. the prevalence of neonatal sepsis was 13.3 %. Table 1. shows the clinical characteristics of the study population. The male to female ratio was 1.5: 1 as 72 were males and 48 females. The mean age of the study population on admission was 7.61±3.61 days. The mean birth weight was 2.78 ± 3.07 kg. Majority of neonates i.e. 23 (71.8%) had early onset sepsis. The frequency of gram-negative bacteria was 27 (84.3%) was much higher than gram-positive organisms which was 5(15.6%).

**Table 1:** Characteristics of study population

| Variable | N (%) |
|---|---|
| **Gender** | |
| Male | 72 (60%) |
| Female | 48 (40%) |
| Age (Days) | 7.50±8.4 |
| Weight (Kg) | 2.78±3.07 |
| Occipitofrontal Circumference (CM) | 33.88±4.9 |
| **Gestational Age (Weeks)** | |
| Pre-Term | 53 (44.2%) |
| Term | 67 (55.8%) |
| **Mode Of Delivery** | |
| SVD | 39 (32.5%) |
| C-Section | 81 (67.5%) |
| **Maternal Antenatal Visits** | |
| Regular | 110 (91.7%) |
| Irregular | 10 (8.3%) |
| **Onset Of Sepsis** | |
| Early Onset | 88 (73.3%) |
| Late Onset | 32 (26.7%) |

Among gram-negative isolates, Acinetobacter baumannii was the predominant organism being isolated in 12 (37.5%), followed by Pseudomonas aeruginosa in 6(18.75%), Burkholderia cepacia in 3(9.4%) and Serratia Marcescens in 3 (9.4%).Table 2 shows the distribution of bacterial isolates in blood culture of the study population. It was noted that among the gram-positive isolates, streptococcus pneumoniae (12.5%) and staphylococcus aureus 1 (3.1%) were the commonest organisms isolated. Table 2 shows the bacterial spectrum of blood culture isolates.

**Table 2:** Bacteriological profile in blood culture - positive neonates

| Gram Negative | Total n=32 | Early-onset sepsis | Late-onset sepsis |
|---|---|---|---|
| | | N (%) | N (%) |
| Escherichia coli | 1 | | 1(100%) |
| Burkholderia cepacia | 3 | 2 (66.7%) | 1(33.3%) |
| Serratia marcescens | 3 | 2 (66.7%) | 1(33.3%) |
| Klebsiella pneumoniae | 2 | 2 (100%) | |
| Pseudomonas aeruginosa | 6 | 5 (83.3%) | 1(16.7%) |
| Acinetobacter baumannii | 12 | 9 (75%) | 3 (25%) |
| **Gram positive** | | | |
| Staphylococcus aureus | 1 | | 1(100%) |
| Streptococcus pneumoniae | 4 | 3 (75%) | 1(25%) |

The overall mortality rate was 8.3% in the study population as 10 neonates expired. All the neonates who expired had gram-negative sepsis while no mortality was observed in sepsis with gram -positive organisms (p-value 0.04).Klebsiella pneumoniae sepsis had the highest mortality as out of the 10 expiries 7(70%) were infected with this organism whereas it was 3 (30% ) had Acinetobacter baumannii infection. It was noted that 12 (44.4%)neonates with sepsis from gram -negative bacteria required invasive ventilation while those with gram-positive sepsis did not require ventilator support (p-value 0.0001).

**Table 3:** Association(cross tabulation) between gram staining and different factors

| Variable | | Gram staining | | | | Chi-square value | p-value |
|---|---|---|---|---|---|---|---|
| | | Negative(24) | | Positive(3) | | | |
| | | % | n | % | n | | |
| Sepsis onset | Early | 74.1 | 20 | 60 | 3 | 0.792 | 0.373 |
| | Late | 25.9 | 7 | 40 | 2 | | |
| Neonatal outcome | Discharged | 63 | 17 | 100 | 5 | 11.23 | 0.004 |
| | Expired | 37 | 10 | 0 | 0 | | |
| Ventilation support provided | Yes | 44.4 | 12 | 0 | 0 | 36.175 | 0·0001 |

The bacterial isolates from blood culture of the study population showed a variable pattern of antibiotics sensitivity. All species of gram- negative microorganisms causing neonatal sepsis in our study were sensitive to Meropenem. However ,colistin was effective against all gram -negative bacteria except Burkholderia cepacia and Escherichia coli. The results of antibiotic sensitivity pattern for both Gram -negative and Gram-positive bacteria are shown in Table 4.

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**Table 4:** Antibiotic sensitivity pattern of the isolate

| Antibiotics | Gram negative organism | | | | | | Gram positive organism | |
|---|---|---|---|---|---|---|---|---|
| | Escherichia coli (1/100%) | Burkholderia Cepacia (3/100%) | Serratia marcescens (3/100%) | Klebsiella pneumoniae (2/100%) | Pseudomonas aeruginosa (6/100%) | Acinetobacter baumannii (12/100%) | Staphylococcus Aureus (1/100%) | Streptococcus Pneumoniae ( 4/100%) |
| Ampicillin | | | | | | | | |
| Co-trimoxazole | | 3(100%) | | | | 12(100%) | | 4(100%) |
| Ciprofloxacin | | | | 2(100%) | 6(100%) | | 1(100%) | |
| Colistin | | | 3(100%) | 2(100%) | 6(100%) | 12(100%) | | 4(100%) |
| Ceftriaxone | | | | | | 12(100%) | | 4(100%) |
| Ceftazidime | | 3(100%) | 3(100%) | | 6(100%) | | | |
| Gentamicin | 1(100%) | 3(100%) | | | | | 1(100%) | |
| Imipenem/ meropenem | 1(100%) | 3(100%) | 3(100%) | 1(50%) | 6(100%) | 3(25%) | | |
| Levofloxacin | | 3(100%) | | | | | | 4(100%) |
| Vancomycin | | | | | | 12(100%) | 1(100%) | 4(100%) |
| Clindamycin | | 3(100%) | 3(100%) | 2(100%) | 6(100%) | | 1(100%) | 4(100%) |
| Piperacillin tazobactam | 1(100%) | | | | | | | |
| Teicoplanin | | | | | | | 1(100%) | |
| Polymyxin | | | 3(100%) | 2(100%) | 6(100%) | 12(100%) | | 4(100%) |

## DISCUSSION

There is a high prevalence of sepsis in the newborn period as well as an alarmingly high resistance to antibiotic therapy partly due to inadequate surveillance systems. Usage of empiric antibiotic therapy is usually required to be initiated early ,as blood culture results take 48 to 72 hours to get. Insensitivity to first- and second-line antibiotics has led to the use of carbapenems as the initial empirical therapy in developing countries. The bacteriological spectrum and antibiotic sensitivity patterns exhibit variance among countries depending on socioeconomic and environmental factors. To improve quality of patient care ,hospital policies should be formulated to promote rational administration of antibiotics especially in the intensive care units [11]. Our study reports a 13.3% rate of culture-proven sepsis in newborns ,in contrast to that reported by Salah *et al* and Al-Shamahy *et al* in Yemen ,wherein the culture -positivity rate of 77.4% and 57% was reported respectively [12, 13]. In concert with our results, in a similar study from Rawalpindi by Ahmed M *et al* the prevalence of culture-proven sepsis in newborns was noted to be 11.3 % whereas other studies from Pakistan by Anwar *et a*l and Malik *et al* have reported a very high prevalence of 42% and 62.5% respectively [14-16]. However, in a study on neonatal sepsis from India by Roy *et al* culture-positivity rate of 26% was reported [17]. Other studies report considerable disparity in prevalence of culture proven sepsis in newborns as evidenced by a prevalence rate of 49.5% observed by Shehab-El Din *et al* from Egypt, 24% was reported in a study from Tanzania and 12.1% from Nepal [18-20]. These differences in the prevalence of neonatal sepsis across different geographical regions could be as a result of various elements involved , such as different socioeconomic conditions and dissimilarity in sampling methods. In advanced countries, neonatal sepsis in a large majority of cases is caused by gram-positive bacteria (58-70.2%) [21]. In the present study , gram-negative bacteria were the most prevalent organisms implicated in both early onset and late onset sepsis. This finding is in concordance with findings of research studies conducted earlier in other growing countries. Macharashvili *et al* in a study from Georgia ,stated that gram-negative bacteria were responsible for 78% of neonatal sepsis cases, with Klebsiella pneumoniae accounting for 37% and Escherichia coli 11% of the cases [22]. Acinetobacter baumannii is a causative organism for a majority of nosocomial infections globally. An Indian study by Kamath *et al* observed Klebsiella pneumoniae species to be most commonly responsible for neonatal sepsis ,being present in16.4%, and Acinetobacter baumannii in 10% of their study population [23]. Similarly, we also found an alarmingly high rate of sepsis with Acinetobacter baumannii in our study , indicating the need to implement strict infection control measures to decrease nosocomial infection. Similar to our findings , Yusef *et al*, found Acinetobacter baumannii (27%) to be the commonest bacteria isolated followed by Klebsiella pneumoniae (22%) [24]. In our study both colistin and polymyxin were found to be effective against all cases of neonatal sepsis with Acinetobacter baumannii and Klebsiella pneumoniae whereas in 75% of Acinetobacter baumannii and 50% of Klebsiella pneumoniae isolates , carbapenem resistance was observed. In concert with our findings, a study from India reported that 93.68 % of Acinetobacter baumannii isolates showed carbapenem resistance and a very high mortality of 59% was observed with Acinetobacter baumannii infection [25]. The use of co-trimoxazole is not very common these days but we found it

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to be quite effective against Burkholderia cepacia. Being a cheaper drug, it would offer the advantage of cost - effectiveness in nosocomial infections caused by unusual organisms such as Acinetobacter baumannii and Burkholderia cepacia [23]. We report an overall mortality rate of 8.3% for neonatal sepsis and it was significantly related to sepsis with gram -negative organisms. In our study ,Acinetobacter baumannii infection was implicated in 30% of the expiries whereas 70% mortality was due to Klebsiella pneumoniae sepsis. Yusef *et al* have reported similar findings [24]. In the present study , Pseudomonas was isolated in 6 blood culture samples out of a total of 32 culture positive samples(18.8%), this suggests the need to control hospital-acquired infection. In concert with the findings of Vinodkumar *et al* ,we observed Pseudomonas aeruginosa isolates to be mostly resistant to aminoglycosides which is a cost effective antibiotic [26]. However ,they were sensitive to expensive therapy such as colistin and ceftazidime. In the present study we observed that ampicillin was not effective against any type of bacteria though it should be empiric first line therapy in neonatal sepsis along with aminoglycosides. This antimicrobial resistance and increase in the prevalence of nosocomial infection in under developed countries is worrisome and can be explained by the irrational use of antibiotics ,lack of antibiotic stewardship programs, self-medication and malpractice by physicians [27].

## CONCLUSIONS

There is a high prevalence of early-onset neonatal sepsis with gram-negative bacteria. Acinetobacter and Pseudomonas contribute to a high mortality and were the commonest bacteria isolated indicating a need to control nosocomial infection. Bacterial insensitivity to ampicillin as empiric therapy is worrisome and calls for strict implementation of antibiotic stewardship programs to rationalize the administration of antimicrobials.

## Conflicts of Interest

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**Original Article**

# Clinical Presentation, Complications and Outcome of Measles in Pediatric Population at Tertiary Care Hospital

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## ABSTRACT

Measles is highly contagious infection with person-to-person transmission through droplet infection in developing countries, which can lead to death in complicated cases. Bronchopneumonia, encephalitis, gastroenteritis with renal failure and electrolyte imbalance are common complications in pediatric age group. **Objective:** To determine complications of measles in hospitalized children at Tertiary Care Children Hospital. **Methods:** This cross-sectional study conducted at inpatient medical wards of National Institute of Child Health from July-Dec 2022. All patients hospitalized in study duration with the diagnosis of measles from 6 months till 12 years of age were enrolled. History, examination, laboratory tests, treatment and outcome were recorded and analyzed. **Results:** Children enrolled were 185, the mean age ± SD of presentation was 26.7 ± 27.1 months, with 56.8% males. Mean weight of patients was 10.48 ± 9.7kg. Common measles complications were bronchopneumonia 160(86.5%), acute diarrhea 64(34.6%) encephalitis 24(13%), myocarditis 16(8.6%), acute kidney injury 11(5.9%), and otitis media 18(9.7%). **Conclusions:** Most common clinical features were fever, maculopapular rash, cough and coryza. Bronchopneumonia was the main reason of hospitalization in majority of patients and leading cause of death in 13.5% of patients along with encephalitis and myocarditis. Additional strategies are required by government for elimination of vaccine preventable measles from Pakistan.

## INTRODUCTION

Measles is highly contagious infection with person-to-person transmission through droplet infection in developing countries, it is one of leading cause of death [1]. It has incubation period from 7-21 days and most common clinical presentation is by high grade fever, generalized maculopapular rash, cough, coryza and conjunctivitis [2]. It is mostly self-limiting illness but it may be associated with several complications which may develop after few days or weeks of rash eruption and include pneumonia (1;20 cases), otitis media (1;10 cases), diarrhea, encephalitis (1:1000 cases) [3]. It may lead to blindness, deafness and long-term morbidities associated with encephalitis [2]. Measles is responsible for 100000 annual deaths, and it has mortality ranging from 1-5 deaths per 1000 cases in Southeast Asia and Africa with as high as 25 deaths per 1000 cases in refugees. Over the past few years outbreaks of measles have been reported throughout the world, which is due to active measles circulation in unvaccinated and under vaccinated population [4, 5]. Immunity is acquired against measles by either infection which is lifelong or by vaccination. In Pakistan according to expanded program of immunization (EPI) two doses of vaccine are given against measles, first at 9 months and second dose which was introduced in 2009 is given at 15 months of age [6]. Measles is eliminable disease as humans are only reservoirs and definitive diagnostic test are available along with safe and

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effective vaccine [7]. In developed countries there is reduction in incidence of measles and its mortality by 75%, whereas incidence is 36 cases/million population [8, 9]. Despite of WHO goals of measles elimination, in Pakistan in 2020 reported measles cases were 2,747 which is under reported due to ineffective reporting system [10]. In Pakistan overall measles vaccination coverage is around 60%, according to WHO and UNICEF surveys which is mainly due to illiteracy and problems with infrastructure of vaccination including availability and delivery of vaccine [11, 12]. It has been observed that transmitted maternal antibodies fades quickly in early few months of life and infants are more prone to be affected by measles before recommended age of vaccination. And there are differences in clinical presentation of measles between infants and older children, therefore we aimed this study to describe clinical presentation, complication and outcome of children hospitalized with acute measles infection.

## METHODS

This prospective cross-sectional study was conducted in all three Inpatient Medical Departments of National Institute of Child Health (NICH) Karachi, which is 500 bedded tertiary care referral center with only Government referral center in province with facility of Pediatric Surgery from January to December 2022. Permission from institute ethical review board of NICH was taken and all patients hospitalized in study duration with diagnosis of measles were included from age 1-14 year of age after taking informed consent from parents. The sample size calculation was done using the Open EPI software for "Sample size calculation" by using the proportion of study conducted at Islamabad [13]. Who reported the 17% mortality in hospitalized measles patients, confidence interval 95% and margin of error 6%, the sample size was 151. Sampling technique was non-probability consecutive sampling. Detailed history and examination were performed and documented along with measles complications. Data were analyzed using SPSS version 25.0 numerical variables like age Complete blood count, Urea creatinine electrolytes, chest X-Ray, MRI Brain findings, and echo findings were calculated as mean ± deviation. Categorical variables like gender, fever, cough conjunctivitis was calculated as frequency and percentage. No specific statistical test applied. All children received routine hospital care according to hospital protocol. Outcome was recorded in form of discharge, left against medical advice or death.

## RESULTS

We enrolled 185 patients with measles in which males were predominant 105(56.8%), females were 80(43.2%). The mean age of presentation was 26.7 ± 27.1 (range 156) months, mean weight of patients was 10.48 ± 9.7(range101) kg, mean height was 74.2 ± 28.6(range141)cm. The common clinical features were fever, rash, cough, conjunctivitis, oral ulcers and difficult breathing as shown in table 1.

| Clinical feature | Frequency (%) |
|---|---|
| Fever | 181(98) |
| Rash | 181(98) |
| Cough | 175(94.6) |
| Conjunctivitis | 158(85.4) |
| Oral ulcers | 149(80.5) |
| Breathing difficulty | 148(80) |
| Diarrhea | 73(39.5) |
| Vomiting | 57(30.8) |
| Fits | 44(23.7) |
| Poor feeding | 120(64.8) |

**Table 1:** Clinical features of patients with measles(n=185)

We found 130(70%) patients were unvaccinated for measles, 47(25%) received single dose while 8(4.3%) received two doses of measles vaccine. Regarding blood tests reports complete blood count shows the mean hemoglobin of 10.87 ± 10.8 (range=103), mean total leukocyte count 28.7 ± 99.6(1300), mean platelets count 237.71 ± 146.6(900). Mean serum urea was 38.15 ± 44.84(397), mean creatinine was 2.16 ± 11.49(136), mean sodium 137.5 ± 96.6(136.1), mean potassium 8.2 ± 11.4(49), mean calcium 12.12 ± 16(104), alanine transaminase 34.2 ± 22.7(263). On chest radiographs we found bilateral pulmonary infiltrates in 148(80%), right lung consolidation in 3(1.6%), left lung consolidation 1(0.5%), pleural effusion 33(17.83%). Echocardiography was abnormal in 16(8.6%) patients which shows decrease ejection fraction and myocarditis. Bronchopneumonia observed in majority of patients with systemic complications, as shown in table 2.

| Clinical feature | Frequency (%) |
|---|---|
| Bronchopneumonia | 160(86.5) |
| Acute diarrhea | 64(34.6) |
| Encephalitis | 24(13) |
| Myocarditis | 16(8.6) |
| Acute kidney injury | 11(5.9) |
| Otitis media | 18(9.7) |
| Bitot spots | 2(1) |
| Conjunctivitis | 3(1.6) |
| Oral ulcers | 166(89.7) |

**Table 2:** Complications of measles(n=185)

In our study 25(13.5%) patients expired and 159(85.9%) were discharged. The death ratio was more in children with bronchopneumonia, myocarditis and encephalitis followed by acute diarrhea and acute kidney injury.

## DISCUSSION

This study describes the clinical presentation, complications and outcome of measles in children at

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tertiary care hospital of developing country. we found that most of our patients present with usual features of measles like fever, cough, coryza and conjunctivitis along with signs of respiratory distress in the form of difficult breathing, nasal flaring and subcostal recessions, Sindhu *et al.*, studied clinical profile of children with measles at India and they also found the similar clinical presentation [14-17]. In our study unfortunately majority of patients were unvaccinated for measles but surprisingly vaccinated patients 8(4.3%) who were completely vaccinated that is two doses of measles vaccine at 9 and 15months of age were also got measles, this may change in the genetics of measles virus which make it protective from vaccine antibodies. Overall measles vaccine is very effective vaccine, but in the study of Hester *et al.*, in United States found 6% of patients received single dose of MMR and got measles infection [15, 16, 18]. We found bronchopneumonia, the most common measles complication which needs hospitalization followed by myocarditis and encephalitis. Asghar *et al.*, studied the measles clinical presentation at hospital found bronchopneumonia commonest complication and acute diarrhea, meningitis, staphylococcal sepsis less commonly [14, 19, 20]. Most common chest X-Ray findings were bilateral pulmonary infiltrates and pleural effusion. lung consolidation in few cases, in other studies similar findings were observed [21]. Bronchopneumonia causes measles related death in 13.5% patients along with multisystem involvement. Nezhoda *et al.*, found mortality rate of 17% this may be because majority of children were malnourished and on top of it measles infection leads to immunosuppression with superadded infections [20, 21].

## CONCLUSIONS

Most common clinical features were fever, maculopapular rash, cough and coryza. Bronchopneumonia was the main reason of hospitalization in majority of patients and leading cause of death in 13.5% of patients along with encephalitis and myocarditis. Additional strategies are required by government for elimination of vaccine preventable measles from Pakistan.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Comparison of RPM (Re-positioning Maneuver) and Liberatory Maneuvers vs Betahistine on BPPV (Benign Paroxysmal Positional Vertigo) for Improving Functional Ability and Quality of Life

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CRP, Betahistine, DHI, SF-36 QoL

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## ABSTRACT

BPPV is a vestibular disease which arises due to positional changes of head. **Objective:** To compare the efficacy of CRP & Liberatory maneuvers collectively in contrast to Betahistine alone for improving quality of life oof BPPV patients. **Methods:** After getting the approval from ERC of RIHS (Rawal Institute of Health Sciences) Islamabad, this study was conducted at Rawal General & Dental Hospital Islamabad from 20th September 2022 to 19th Jan 2023. 30 patients between age of 20-50 years with first episode of vertigo were included in this study. Two groups were formulated. Group A patients were given CRP (Epley's maneuver) & Liberatory maneuver (Semont's) whereas group B patients were given just Betahistine 16mg. Both techniques were used twice a day for one week. Tools used for assessment were DHI & SF-36. SPSS version 21 was employed for analysis. **Results:** Mean±SD of age was 32.40±10.91 in group A and 29.93±11.67 in group B. The frequency of age between 20-30 years old patients was 07(46.4%) in group A and 11(73.7%) in group B. The frequency in age group 31-40 & 41-50 was 04(26.8%) & 04(26.8%) in group A whereas in group B it was 04(26.3%) & 0(0%) respectively. within group analysis of both groups showed significant improvement ($p<0.05$) on. Between groups Analysis revealed insignificant difference ($p>0.05$). **Conclusion:** Both maneuvers in combination are equally effective as Betahistine is in improving the quality of life of BPPV patients.

## INTRODUCTION

Benign Paroxysmal Positional vertigo is a vestibular condition in which positional changes of head result in short, repetitive spell of dizziness and vertigo with or without nystagmus [1]. The main complaint of patients who visit the ER are vertigo, dizziness and imbalance [2,3]. In general population it is common in second to fifth decade of their life [4, 5]. Both genders are equally susceptible for the development of this condition [6]. Among physical tests, Dix Hal Pike and Log roll tests are commonly employed for the diagnosis of BPPV [7]. All three SSC (Semicircular Canals) are equally prone to be affected by this disease. But among others Posterior SSC is more commonly affected [8]. Clinician used Dix Hal Pike as a diagnostic physical test for BPPV. By using this maneuver, the clinician elicits the nystagmus and vertigo which enable them in the diagnosis of exact SSC which is affected. This maneuver is performed in supine line position with patient head hanging over the edge of the bed [9]. Vertigo spell initiates and the repetitive movement of eyeball is noticed [10, 11]. Many treatment options are available in literature. Medical and rehabilitation interventions are employed in routine for the management of BPPV. But in some severe cases surgical intervention are also done but rarely. Among rehabilitation interventions CRP (Canalith Repositioning) & Liberatory Maneuvers are generally used. In CRP, Epley's and in Liberatory, "Semont's"

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maneuvers are employed [12, 13]. The mechanism of these maneuvers is to reposition the dislodged Canalith towards the utricle. The Semont's maneuver is used for the resistant & chronic cases where vertigo comes frequently. In medical intervention, Betahistine (an anti-histamine) drug is used commonly [14]. The MOA of this drug is that it increases the blood circulation in inner ear canal by acting on $H_1$ agonist receptors along with $H_3$ antagonistic receptors which in turn further enhance the action of former receptors. Due to this activation of $H_1$ antagonists the vertigo diminishes in short duration of time. This drug is used routinely for the management of BPPV. The purpose of this study was to compare the CRP & Liberatory maneuvers in contrast to Betahistine and to evaluate whether these maneuvers are as effective as this drug is. This in turn will help us use of these maneuvers instead of medicine as these maneuvers are safe and easy to be done at home by patient him/herself.

## METHODS

It was a RCT of single blind type which was conducted, after getting the approval from ERC of RIHS (Rawal Institute of Health Sciences) Islamabad, at Rawal General & Dental Hospital Islamabad from 20th September 2022 to 19th Jan 2023. Sample size was calculated by WHO calculator which was 30. Two equal groups of 15 patients were made. Patients between age of 20-50 were included in this study who had no comorbidity of any kind and who had experienced vertigo for the first time in their life. All diagnosed cases of BPPV by specialist were included in this study who had positive Dix Hall pike test as well. All those patients who had chronic or second time vertigo spells of BPPV were excluded from this study alone with those who had central type of vertigo diagnosed by clinician. Group A was of maneuvers and Group B was of Betahistine. Two treatment interventions were given to each group daily for 1 week. Both maneuvers were given in combination to group A and 16mg of Betahistine to group B. Both intervention were given at the intensity of twice a day. Data were collected at baseline and after one week of intervention. Tools used for assessments were DHI (Dizziness Handicap Inventory) for vertigo and SF-36 for quality of Life. SPSS version 21.0 was employed for the analysis of data. Firstly, normally of data were checked by Shapiro Wilk test. As our data were non-normally distributed ($p<0.05$), we employed non-parametric test for data analysis. For within- group analysis, we used Wilcoxon-rank test and for Between groups we employed Man Whitney-U test. Demographic data was depicted in the form of mean & Standard Deviation. $P<0.05$ was kept as level of significance and CI=95% as confidence interval in this study.

## RESULTS

Total 30 patients were included int this study. 15 in each group. The frequency of ae between 20-30 years old patients was 07(46.4%) in group and 11(73.7%) in group B. The frequency in age group 31-40 & 41-50 was 04(26.8%) & 04(26.8%) in group A whereas in group B it was 04(26.3%) & 0(0%) respectively. The frequency of male in group A & B was 05(33.3%) & 07(46.4%) whereas of females it was 10(66.7%) & 08(53.6%) respectively (Table 1).

| Variable | Group A | Group B |
|---|---|---|
| **Age** | **n (%)** | **n (%)** |
| 20-30 | 07(46.4) | 11(73.7) |
| 31-40 | 04(26.8) | 04(26.3) |
| 41-50 | 04(26.8) | 00(00) |
| **Gender** | | |
| Male | 05(33.3) | 07(46.4) |
| Female | 10(66.7) | 08(53.6) |
| **Marital Status** | | |
| Single | 12(80) | |
| Married | 03(20) | |

**Table 1:** Demographic data

The mean±SD of age was 32.40±10.91 in group A and 29.93±11.67 in group B (Table 2).

| Age | Mean+SD |
|---|---|
| Group A | 32.40+10.91 |
| Group B | 29.93+11.67 |

**Table 2:** Descriptive statistics

Within group comparison of DHI score in group A had median & IQR (interquartile range) in pretest functional, physical, emotional & total scores were 30(10), 26(10), 204) & 7618) respectively. Whereas in post-test DHI functional, emotional, -physical & total scores were 4(6), 4(4), 2(4) & 10(12) respectively. The p-value was <0.05 in each group which depicted a significant change within group. In group B, Md (IQR) of DHI tool subgroups were 32(4), 30(8), 20(4) & 82(14) in pretest functional, -emotional, Physical and total score whereas in post-test scores of these variables were 4(4), 2(4), 2(1) and 8(6) respectively. There was also a significant difference in group B within group analysis as $p<0.05$. SF-36 QoL had also showed significant results in both groups as p-value was <0.05 in both Group A & B. Md (IQR), z & p-values of both groups SF-36 QoL & HDI are given in table 3.

| Variable | Group A | | | Group B | | |
|---|---|---|---|---|---|---|
| **DHI** | **Md (IQR)** | **z** | **p-value** | **Md (IQR)** | **z** | **p-value** |
| Pre-test Functional Score | 30(10) | 3.41 | 0.00 | 32(4) | 3.42 | 0.00 |
| Post-test Functional Score | 4(6) | | | 4(4) | | |
| Pre-test Emotional Score | 26(10) | 3.41 | 0.00 | 30(8) | 3.41 | 0.00 |
| Post-test Emotional Score | 4(4) | | | 2(4) | | |
| Pre-test Physical Score | 20(4) | 3.43 | 0.00 | 20(4) | 3.42 | 0.00 |
| Post-test Physical Score | 2(4) | | | 2(1) | | |

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| | | | | | | |
|---|---|---|---|---|---|---|
| Pre-test Total Score<br>Post-test Total Score | 76(18)<br>10(12) | 3.41 | 0.00 | 82(14)<br>8(6) | 3.41 | 0.00 |
| QOL | | | | | | |
| Pre-test SF-36 Score<br>Post-test SF-36 Score | 39(2)<br>92(4) | 3.40 | 0.00 | 37(3)<br>91(13) | 3.35 | 0.00 |

**Table 3:** Within group Analysis

Between groups Analysis by Man Whitney U test demonstrated that there was insignificant difference between both groups as p>0.05. Mean Rank of functional score in group A & B were 17.93 & 17.19 respectively. The MR of emotional physical & DHI total score as 18.67, 18.40 and 18.70 in group A whereas MR of group B were 13.50, 13.75 & 13.40 respectively. SF-36 QoL MR in group A & B were 19.30 & 12.81 with p=0.05 which is not less than 0.05. This revealed that both DHI & QOL-SF-36 improved equally in both groups. Therefore, both groups are equally effective in improving vertigo & quality of life in BPPV sufferers. The MR, U & p-values of emotional, Physical & total score of DHI in group A & B are depicted in table 4.

| Variable | Group | MR | U | p-value |
|---|---|---|---|---|
| **DHI** | | | | |
| Functional | Group A | 17.93 | 91.00 | 0.26 |
| | Group B | 17.19 | | |
| Emotional | Group A | 18.67 | 80.00 | 0.12 |
| | Group B | 13.50 | | |
| Physical | Group A | 18.40 | 84.00 | 0.16 |
| | Group B | 13.75 | | |
| Total Score | Group A | 18.73 | 79.00 | 0.11 |
| | Group B | 13.44 | | |
| QOL SF-36 | Group A | 19.30 | 70.50 | 0.05 |
| | Group B | 12.91 | | |

**Table 4:** Between groups Analysis

## DISCUSSION

In our study we have compared the efficacy of CRP & Liberatory maneuvers in contract to Betahistine. We employed DHI (Dizziness Handicap Inventory) for evaluation of vertigo and SF-36 for Quality of life. The main purpose of this study was to evaluate the outcome of these intervention in improving the quality of life of patients who had BPPV. The results of our study on the basis of DHI & SF-36 have shown improvement in both groups equally. M Cavaliere et al conducted a RCT to evaluate the efficacy of maneuvers and pharmacotherapy for the management of BPPV. In their study they formed 4 groups on the basis of Semont's maneuver, Brandt Daroff exercises alone and in combination with Betahistine. They took assessments at $7^{th}$, $14^{th}$, $30^{th}$ & at $60^{th}$ day of intervention [15]. The results of their study demonstrated that all types of interventions are equally effective for the BPPV management. Our study results are positively supported by this study that maneuvers alone are equally effective if used without Betahistine. Salman et al conducted a randomized control trail to compare the effectiveness of mEpley's & Semont's maneuver with or -without Betahistine for the management of BPPV. they used DHI & EQ-5D-5L tool for the assessment. The results of their study depicted that both treatments are equally effective for the management of BPPV [16]. This study also positively reinforces our results that maneuvers alone are also effective for the BPPV management if not used with Betahistine. K Stambolieva et al conducted a RCT to compare the efficacy of Epley's alone and in combination with Betahistine for BPPV along with postural stability. They formulated 4 groups on the basis of BPPV duration of onset and treatment interventions. Results depicted that if Betahistine used after maneuvers it improves vertigo and postural stability more effectively [17]. Our study is also supported by these results as well. A double blinded RCT was conducted by Lee J D et al to compare the efficacy of various maneuvers and sham intervention [18]. They formulated three groups in their study. They administered Epley's maneuver to group A, Semont's to group B and Sham maneuver to group C. Results of their study depicted that Epley's group had more improvement if compared to other two groups. But overall, all groups were effective for BPPV management. Our results are also supported that both maneuvers (Epley's & Semont's) are effective for BPPV in improving vertigo and their quality of life. A RCT conducted by KM Iqbal et al to compare the additional benefits of Betahistine & daroff exercises on BPPV patients [19]. They formulated three groups in their study. They used each of above-mentioned technique alone and in combination with Epley's maneuver. Results showed that Betahistine - mesylate and daroff exercises had additional effects in improving the BPPV patient's vertigo as compared to just maneuver alone. These results are also in coherence to ours. Ibrahim S et al carried out a RCT to demonstrate the additional effects -of the Betahistine as an add-on therapy to Epley's maneuver [20]. The formulated two groups of 100 patients. Group received Betahistine as an add-on drug to Epley's and group B just received Epley's alone. VAS & HDI tools were used for assessment purpose. Results depicted improvement in both groups but the mean change in values were greater in group A in contract to group B. Therefore, they concluded that this drugs further improves patient vertigo if used along with CRP maneuver although maneuvers alone are also beneficial. Our study is also supported by these results. The main objective of this stud was to evaluate and to compare the effectiveness of CRP maneuvers & Liberatory maneuvers in combination in contrast to Betahistine alone. The results demonstrated that maneuvers are as effective as of drug alone. Betahistine acts on receptors of inner ears and improves the flow of blood which in turn diminishes the vertigo.

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Therefore, maneuvers alone can be used in the management of BPPV without any drug.

## CONCLUSIONS

It was concluded from this study that CRP & Liberatory maneuvers are as effective as Betahistine is, in the treatment of vertigo and improving the quality of life of benign paroxysmal- positional vertigo patients. A larger scale double or triple blind RCT should be conducted and more than 2 groups should be formulated to evaluate the exact efficacy of each maneuver and drug. More than 2 assessment tools should also be used in that study to determine the all dimensions of improvements.

## Conflicts of Interest

The authors declare no conflict of interest

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**Original Article**

# Diagnostic Accuracy of Leucocyte Esterase Dipstick Test for The Diagnosis of Spontaneous Bacterial Peritonitis in Children with Nephrotic Syndrome

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## ABSTRACT

Spontaneous bacterial peritonitis (SBP), which has a high fatality rate if antibiotics are not given promptly, is one of the most serious side effects of nephrotic syndrome and ascites. Therefore, it is essential for survival to diagnose and treat SBP early. A quick dipstick test for leukocyte esterase can identify the SBP. **Objective:** To determine the diagnostic accuracy in detection of SBP using leucocyte esterase dipstick test in children with nephrotic syndrome taking ascitic fluid neutrophil count as gold standard. **Methods**: A Cross Sectional Study was carried out Khyber teaching hospital and LRH Peshawar Pakistan. This research covered patients of either gender with nephrotic syndrome and ascites. On admission, diagnostic paracentesis was performed. The ascitic fluid collected at the bedside was examined immediately using a reagent strip. The PMN cell count in ascitic fluid was then determined. A positive +3 result on a leukocyte esterase dipstick was declared positive for SBP while absolute neutrophil count more than 250 cells per $mm^3$ was considered confirmatory. **Results**: A total of 107 patients were enrolled. Age of the patients ranged from 4 to 14 years. Mean age of the patients was 6.68 ± 1.239 years. Male to female ratio was 1.7: 1. The sensitivity, specificity, positive and negative predictive value of leucocyte esterase dipstick test were 86.4%, 92.0%, 73.1% and 96.4% respectively. **Conclusion**: It is concluded that reagent strips are quick, practical, and low-cost diagnostics with good sensitivity and specificity for identifying SBP in children with nephrotic syndrome

## INTRODUCTION

An ascitic fluid infection without a clear peritoneal surgically treatable cause is referred to as SBP. Nephrotic syndrome and ascites can both result in the serious condition of spontaneous bacterial peritonitis (SBP) [1]. 10% to 30% of people with nephrotic syndrome and ascites also have SBP [2]. This consequence has a 30–50% mortality rate if not addressed, and death may occur within a few hours. Antibiotics can elicit a recovery within as short as 48 hours [3]. SBP must be diagnosed and treated as soon as possible to avoid death [4]. SBP symptoms are vague. Fever, gastric discomfort, nausea, and vomiting are some of the symptoms [5]. A diagnostic abdominocentesis is a ordinary therapeutic procedure for these reasons in any child with recently diagnosed ascites associated with nephrotic syndrome or previously diagnosed ascites patient who manifests symptoms and signs of SBP. Regardless, culture of ascitic fluid, which is inconsistently positive in 40–90% of patients, an ascitic fluid

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polymorphonuclear (PMN) count of 250 cells/mm3 is the typical for SBP diagnosis SBP [6]. The diagnosis is typically delayed because the ascitic fluid PMN and total leukocyte count are typically not performed right away. Therefore, a quick, straightforward screening test is necessary for the precise diagnosis of SBP. Leukocyte esterase activity may be checked using a strip test [7]. The test is founded on the granulocytes' esterase activity. The substrate, 3-hydroxy-5-phenyl-pyrrole esterified with utilization of amino acid. This ester is hydrolyzed by the esterase to create 3-hydroxy-5-phenyl-pyrrole, which interacts with the proper diazonium salt to create a violet azo dye whose intensity is correlated with the leukocyte count [8]. Leukocyte esterase reagent strip testing has been recommended for the rapid detection of meningitis, urethritis, and peritonitis in cirrhotic patients [9]. With ascitic fluid neutrophil count serving as the gold standard, the goal of this study is to evaluate the diagnostic performance of the leucocyte esterase dipstick test for the identification of spontaneous bacterial peritonitis in children with nephrotic syndrome.

## METHODS

This cross sectional study was conducted at Paediatrics department, Khyber Teaching Hospital Peshawar Pakistan during March 2019 to November 2019. After taking approval from the research review board of the hospital. Informed consent was taken from the parents of all study contributors. A total 107 patients were involved in this study. A sample size was calculated using WHO online calculator. Patients with nephrotic syndrome and ascites complaining of fever and abdominal pain were enrolled. Patients with concomitant liver disease like congenital hepatic fibrosis, endocrine disorder like hypothyroidism and Cushing syndrome, congenital cardiac anomalies, cardiomyopathies, abdominal tuberculosis and patients with secondary bacterial peritonitis were excluded. Nephrotic syndrome was confirmed based on the presence of triad including 1) clinical finding – edema (peripheral or central) 2) serum albumin less than 3gm/dl 3) 24 hour urinary proteins more than 3.5 gm. Presence of ascites confirmed clinically with abdominal examination. Ultrasound guided 10cc ascitic fluid was drawn under local anesthesia and strict aseptic milieu. 05 cc ascitic fluid sample was sent to hospital laboratory for analysis under microscope for neutrophil count. Presence of ≥250 cells per $mm^3$ was considered confirmatory for the presence of SBP. Leucocyte esterase dipstick was placed in the remaining 05 cc for 05 minute and change in the color was noted and compared with reference standards. Results of the leucocyte esterase dipstick were compared with the results of microscopic analysis to determine the diagnostic accuracy of leucocyte esterase dipstick test. The sensitivity and specificity were calculated in the study evaluating the diagnostic accuracy of the Leucocyte Esterase Dipstick Test. The accuracy was determined by the number of positive results found among the total. All data was collected on pre-designed proforma. The statistical analysis program IBM SPSS version 24.0 was used to enter and analyze data. Mean and standard deviations were calculated for quantitative variables. The qualitative variables were presented in the form of frequencies and percentages.

## RESULTS

A total of 107 patients were enrolled during study period. Age of the patients ranged from 4 to 14 years. Mean age of the patients was 6.68 ± 1.239 years. Majority of the patients were in the age group 4 – 8 years (68 patients, 63.5%) while the remaining 39 patients (36.5%) belonged to the age group 9 – 14 years. The ratio of male to female participants among the enrolled patients was 1.4: 1. Mean serum albumin was 2.35±0.472 gm/dl while mean duration of illness was 14.39±5.273 months (table 1).

| Parameters | Minimum | Maximum | Mean ± SD |
|---|---|---|---|
| Age (years) | 4 | 14 | 6.68 ± 1.239 |
| Disease Duration (months) | 6 | 30 | 14.39±5.273 |
| Serum albumin (gm/dl) | 1.3 | 2.9 | 2.35±0.472 |
| **Gender of Patient's** | | | |
| Male | 76 (71.02%) | | |
| Female | 31 (28.97%) | | |

**Table 1:** Baseline characteristics of patients

The number of patients diagnosed with SBP on ascitic fluid R/E based on absolute neutrophil count ≥250 cells/$mm^3$ as well as correctly diagnosed by leucocyte esterase test were 19 (17.7%). Seven patients (6.5%) had neutrophil count ≥250 cells/$mm^3$ but labelled negative for SBP on leucocyte esterase dipstick test. Three patients (2.8%) were labelled positive for SBP on leucocyte dipstick test however their ascitic fluid analysis revealed neutrophil count less than 250 cells/$mm^3$. Rest of the 78 patients (72.9%) were labelled negative for SBP both on dipstick stick test and ascitic fluid analysis (table 2).

| PMN Count ≥ 250 cells/mm3 | Leucocyte Esterase Dipstick | | Total |
|---|---|---|---|
| | Positive | Negative | |
| Positive | 19 | 03 | 22 |
| Negative | 07 | 78 | 85 |
| Total | 26 | 81 | 107 |

**Table 2:** 2×2 table (Leucocyte esterase dipstick versus PMN count)

The sensitivity, specificity, positive predictive value, negative predictive value and overall accuracy of leucocyte esterase dipstick for the diagnosis of spontaneous bacterial peritonitis were 86.4%, 92.0%, 73.1%, 96.4% and 90.9% respectively (table 3).

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| Accuracy | % |
|---|---|
| Sensitivity | 86.4 |
| Specificity | 92.0 |
| Positive predictive value | 73.1 |
| Negative predictive value | 96.4 |
| Overall accuracy | 90.9 |

**Table 3:** Accuracy of leucocyte esterase dipstick

## DISCUSSION

A major consequence of paediatric nephrotic syndrome is spontaneous bacterial peritonitis. Peritonitis happens in 2% to 6% of individuals with nephrotic syndrome, while incidence as extreme as 17% have been reported in studies [10, 11]. While majority of episodes have been reported during the first couple of years after diagnosis, peritonitis is a rare primary presentation [12]. In our study, peritonitis was confirmed in 19 patients (17.7%). Our study results are similar to the results of study conducted by Rashid J and colleagues [13]. In patients with nephrotic syndrome, spontaneous bacterial peritonitis has a complex and varied etiology. The most frequent causes of SBP are Gram negative organisms, particularly Escherichia coli and S. pneumoniae [14]. Numerous studies have suggested that the majority of paediatric peritonitis may now be caused by Gram-negative microorganisms as a result of the widespread immunization against pneumococcal bacteria in many countries [15]. S. pneumoniae, however, continues to be a significant contributor to spontaneous bacterial peritonitis in children with nephrotic syndrome [16]. Gorensek MJ et al, reported abdominal pain and fever as the most prevalent symptoms of SBP in their in study [10]. In our study, all patients enrolled had abdominal pain and fever as their presenting complaint. Diarrhea was reported in 50% patients with nephrotic syndrome and ascites complicated by SBP [17]. None of the study participants in our study had diarrhea as their presenting complaint. The mean duration of illness in our study was 14.39±5.273 months. This is in agreement with the results as reported by other studies [12, 18]. Leukocyte esterase, which was first utilized for urine analysis, is now extensively employed for diagnosing bodily fluid infective conditions, and several studies have verified its accuracy and validity for PMN cell identification [19, 20]. To our knowledge, this study is the first of its kind evaluating the diagnostic validity of leucocyte esterase for SBP in children with nephrotic syndrome in our setup. Very little knowledge is available on this subject even internationally. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of leucocyte esterase dipstick taking PMN count as gold standard were 86.4%, 92.0%, 73.1%, 96.4% and 90.9% % respectively. Our study results are lower than the results of the study conducted by Farahmand and colleagues [19]. These discrepancies in test validity may be attributed to the use of different commercial dipsticks with varying colorimetric scales.

## CONCLUSIONS

It is concluded that reagent strips are quick, practical, and low-cost diagnostics with good sensitivity and specificity for identifying SBP in children with nephrotic syndrome.

## Conflicts of Interest

The authors declare no conflict of interest

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**Original Article**

# Effect of Skills Competency- Based Orientation on Clinical Performance Among Nursing Interns at University of Lahore Teaching Hospital

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## ABSTRACT

The competencies of nursing interns have direct effects on the wellbeing and health of patients, and lack of it can result in severe problems for the patients. Thus, the clinical performance and competence of nursing interns are the main professional and corporate problems for nurses and patients. Furthermore, it is needed that the nurses show the capability to supply quality care for patients and to collaborate with other nurses and colleagues. **Objective:** To determine the effect of skills Competency- based orientation on clinical performance among nursing interns at University of Teaching Hospital Lahore. **Methods:** A quasi experimental study design was used to conduct this study at University of Lahore Teaching Hospital among nursing interns. A simple random sample of n=40 participants was recruited. The educational intervention consisted of 12 sessions of 40 to 50 minutes each, from June, 2022 to August 2022.To collect data, permission was granted from the Research Ethical Committee (REC) and then Medical superintendent of University of Lahore Teaching Hospital. To assess the performance among nursing interns, an observational checklist was used. Data of the study participants were entered in statistical software SPSS 21.0 and was analyzed accordingly. **Results:** Findings revealed a significant effect of the educational intervention program on performance of nursing interns (Pre interventional performance score 21.00 $\pm$5.088and post interventional performance score 38.00$\pm$4.481among the nursing interns (p- value <0.001). **Conclusion:** It is concluded that nursing education program has effect on performance among nursing interns.

## INTRODUCTION

Competencies are essential for nursing interns to provide care for patients. The clinical performance and competence of nursing interns are the main professional and corporate problems for providers and buyers of nursing care. Furthermore, it is needed that the nurses show the capability to supply quality care for patients and to collaborate with other nurses and colleagues [1]. Previous research shows that Instead of taking a comprehensive approach to patients, nursing interns are task-oriented indicated that nursing interns struggle to recognize changes in patients' health because they lack advanced clinical skills such medical administration, physical assessment, emergency procedures, and communication [2, 3]. Nursing education programs and nursing interns' professional development both benefit from lifelong learning initiatives [4]. High turnover rates also leads to lack of clinical skills and competences [5].Although some research has been done to determine how competency-based orientation affects clinical performance and patient outcomes [6].Nursing interns performed better in the clinical setting because to competency-based orientation. Implementing competency-based orientation is suggested in this review in order to improve nursing interns' clinical performance [7]. Unfortunately, both seasoned nurses and nursing students frequently overlook or disregard the warning indications of physiological decline.

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However, these systems and processes have not yet assigned roles or specified the necessary capabilities for health care providers [8]. In order to guarantee patient safety in all care situations, it is important to be able to maintain a sufficient number of care personnel in addition to being able to offer a suitable mix of nursing competence [9].Previous research shows that nursing interns are more task-oriented [10]. Nursing interns must be closely watched over and constantly monitored to ensure their clinical competency. The ongoing evaluation of nursing interns' clinical competence is a major source of worry since it is essential to ensuring that patients receive safe, high-quality care [11]. Nursing competence is defined as the capacity of a nurse to successfully exhibit a range of qualities, including personal traits, values, attitudes, knowledge, and abilities, which are necessary to carry out his or her professional responsibilities [12]. According to Naylor et al., there are beneficial relationships between nursing interns and the caliber of patient care, and nursing interns play a significant and influential role in enhancing health outcomes [13]. Additionally, some preventive services, like a vaccination for the 2020 corona virus, may have significant economic advantages that, according to long-standing custom, are not typically considered in a competency base orientation cost calculation [14]. Poor nursing interns' competency lead to increase in number of people being admitted to hospitals with co morbidities and multisystem disorders [15]. Also competency-based orientation places a strong emphasis on the nursing interns' capacity to carry out the role expectations for which they have been hired [16]. High levels of professional competence among nursing interns are linked to better patient outcomes. It has been demonstrated that the effectiveness of nursing care is dependent on nurses' competence, which is essential to the standard of care and patient safety [17]. In an experimental the outcome indicated that the Programmed was successful and that there was a very statistically significant change between the pre- and posttest (p0.0001)[18]. A study was conducted in Hong Kong the nursing interns who had completed a competency test (87.3%) significantly showed that they knew more about patient care [19]. According to a study done in Turkey, the competency levels of interns was very good in 59.7%, good in 34.7%, fair in 79.2% of cases, and poor in 18.1% of cases. The kind of unit and the nursing interns' competency scores had a statistically significant link (p = 0.013) [19]. A study conducted in Tehran, Iran, demonstrated that competency-based education affects clinical performance (P =.255, 95% CI: 0.319 to 0.192)16. In a study done in India, t was discovered that the Pre-Clinical Competency Certification Program had an immediate impact on the competency of nursing interns [20].

## METHODS

A quasi experimental pre-post study design was used to carry on this study. This study was conducted at the University of Lahore Teaching Hospital. The study participants were all the nursing interns working there. A simple random sample of n=40 participants was recruited with $\alpha$=0.05 and $\beta$=0.10. The calculated sample size was 40 using the following Slovins' formula

$$n=N/1+N(e)^2$$

(n)=sample size, N=Total population, (e) = margin of error

N= 45

e = 0.05

$$n= 45/1+45(0.05)^2$$

$$n=40$$

Inclusion Criteria were nursing interns appointed at University of Lahore teaching Hospital, nursing interns directly involved in patient care, willing to participate. all the participants were in the age group 22 to 25 because they got admission in the age of 17 to a8 years and at the completion of degree they were about 22 around. Exclusion Criteria was working at out-patient department and not willing to participate. An educational program was developed with the help of different books and internet material. The educational intervention consisted of 12 sessions where each session consisted of 40-50 minutes. This was done through different learning methods like groups lecture, groups' discussion and distribution of skills handouts. To conduct this educational program, the participants were approached in groups during at the teaching room of university of Lahore teaching hospital. The educational interventions plan started from June, 2022 till August 2022, where each study participant received all the education sessions one by one each month during their duty. A performance is an act or skill performed by a nursing intern working at university hospital that was measured by nursing competencies for nursing interns**.** Total score was 42 where score<15was considered as poor performance, score 15-30was considered as Satisfactory performance and score>30 was considered as Good performance. To collect data, first of all, permission was granted from the Research Ethical Committee (REC) of the University of Lahore. Then permission was taken from the Medical superintendent of University of Lahore Teaching Hospital. The nursing interns were approached for data collection. To assess the performance among nursing interns, an observational checklist was used. After the intervention, the participants were asked to fill the data collection tool of performance of nursing competency checklist again to assess the comparison. Data of the study participants was entered in statistical software SPSS 21.0 and was analyzed accordingly. Results of the study were

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presented as median ± standard deviation through tables. Performance among nursing interns, pre and post score was compared using Wilcoxon ranked (z) test after checking for normality test assumptions. P-value ≤ 0.05 as standard value was considered as significant value..

## RESULTS

Table 1below indicated that there were 37(92.50%) of the study participants in the age category of 22-23 years and 3 (7.5%) among the study participants were in the age group of 24- 25 years. Similarly, among the study participants 37(92.50%) were female and remaining 3 (7.5%) were male participants. Moreover, the findings also showed that 3 (7.5%) among the nurse interns belonged to general nursing Diploma and majority 37 (92.5%) were BS Nursing Graduates. It was also found that 3 (7.5%) among the participants were married and remaining majority 37 (92.5%) were unmarried.

| Variables | Frequency |
|---|---|
| **Age (n=40) in years** | |
| 22-23 Years | 37 (92.5%) |
| 24-25 Years | 03 (7.5%) |
| **Gender (n=40)** | |
| Male | 03 (7.5%) |
| Female | 37(92.5%) |
| **Qualification (n=40)** | |
| General Nursing Diploma | 03(7.5%) |
| B S nursing | 37(92.5%) |
| **Marital status (n = 40)** | |
| Unmarried | 37(92.5%) |
| Married | 03(7.5%) |

**Table 1:** Demographic characteristics of participants (n=40)

The findings in below table 2 showed that before the competency based skills intervention 18 (45%) of the research participants had poor performance, 22 (55%) were having satisfactory performance and no participant was having good performance in the pre-intervention phase. After the competency based educational intervention 6 (15%) of the study participants were having satisfactory performance and 34 (85%) of the participants had good practices. On the other hand 0 (0.00%) had poor performance which indicated that the intervention increased the performance score to a great extent.

| Nursing Interns' Performance | Pre-Interventional F (%) | Post-Interventional F (%) |
|---|---|---|
| Poor performance | 18 (45%) | 0 (0.00%) |
| Satisfactory Performance | 22 (55%) | 6 (15%) |
| Good performance | 0 (0.00%) | 34 (85%) |

**Table 02:** Comparison of pre-post intervention performance (n=40)

Table 3 below indicated that Wilcox on signed ranked test was used to evaluate the effect of competency based educational intervention on participants' performance. A very highly statistical significant median difference was found (+17.00) on nursing interns performance between pre and post interventional scores of skills based competency among nursing interns *Wilcox on (z)* (-5.513[b]) , *p*value=(0.00•), with median and SD (21.00 ±5.088vs. 38.00±4.481).

| Variable | N | Pre-Intervention Median +SD | Post-Intervention Median +SD | Median difference | Wilcoxon (Z) Test | p-Value |
|---|---|---|---|---|---|---|
| Performance Score | 40 | 21.00 +5.088 | 38.00+4.481 | 17.00 | -5.513[b] | .000 |

**Table 3:** Wilcoxon Signed Ranks Test

## DISUSSION

Findings of this current study indicated that majority of the participants 37(92.50%) were in the age category of 22-23 years. Similar findings were found in a previous study where all (100%) of the participants were in the age group of 20 to 23 years. Other study findings also showed that the mean age of the studied subjects is 22.8± 2.99 years which means that they were 22 to 23 years of age [21]. Moreover some different findings were found by a past research where two thirds of them (66.7%) were aged less than 23 years with Mean ± SD (22.45±1.06) [22]. Similarly, among the study participants 37(92.50%) were female and only 3 (7.5%) were male participants which indicates that females are in a great majority in this current study. These findings were found consistent with a past study where 98% of students were female, and 2% were males [21]. The gender statistics represented in all above studies gives such an impression that all over the world, majority of the nurses constituent among females nurses. The findings in this current study showed that before the competency based skills intervention 18 (45%) of the research participants had poor performance, 22 (55%) were having satisfactory performance and no participant was having good performance in the pre-intervention phase. After the competency based educational intervention 6 (15%) of the study participants were having satisfactory performance and 34 (85%) of the participants had good practices. On the other hand 0 (0.00%) had poor performance which indicated that the intervention increased the performance score to a great extent. A previous study presented very similar distribution of nurse interns (73%), were having poor or average skills competency in the pre-test and gained skills competency as experts (94%) in the post-test [21]. Findings of this current study also evaluated the effect of competency based educational intervention on participants' performance. A very highly statistical significant median difference was found (+17.00) on nursing interns performance between pre and post interventional scores of skills based competency among nursing interns

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*Wilcoxon (z)* (-5.513b) , *p*value=(0.00•), with median and SD (21.00 ±5.088 vs. 38.00±4.481). Similarly, a previous study also showed that there was very highly statistically improvement in total competencies skills with Mean ± SD (38.92±7.90) pre-program that improved to (81.69±7.62) immediate post educational program21. Also in another past study the mean value for the pretest was 30.05 ± 7.23 and 71.87 ± 6.93 for the posttest. The *p*-value is <0.001, which is significant [21]. Moreover another quasi-experimental study evaluated the effects of competency-based orientation among nurses intern at Benha University Hospital was undertaken in Egypt in 2019. After the program's implementation, there was an extremely statistically significant (P 0.005) improvement in the practicing abilities of nursing interns toward competencies [22].

## CONCLUSIONS

The overall findings in this current study showed that after the competency based educational intervention 6 (15%) of the study participants were having satisfactory performance and 34 (85%) of the participants had good practices. On the other hand 0 (0.00%) had poor performance which indicated that the intervention increased the performance score to a great extent. Also the findings of this current study also evaluated the effect of competency based educational intervention on participants' performance. A very highly statistical significant median difference was found (+17.00) on nursing interns performance between pre and post interventional scores of skills based competency among nursing interns *Wilcoxon (z)* (-5.513[b]) , *p*value=(0.00•), with median and SD (21.00 ±5.088 vs. 38.00±4.481).

## Conflicts of Interest

The authors declare no conflict of interest

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**Original Article**

# Esophageal and Gastric Stricture Formation Following Corrosive Ingestion in Our Local Population

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## ABSTRACT

Corrosive substances are defined as chemicals which cause injury upon coming in contact with living tissues such as the skin, gastrointestinal tract, respiratory tract and eyes. These include acids, alkalis, oxidizing agents, hydrocarbons among others. **Objective:** To determine the frequency and difference in the frequency of upper gastrointestinal stricture formation following corrosive ingestion in the gastroenterology unit of Lady Reading Hospital, Peshawar. **Methods:** This cross- sectional study was held in the Gastroenterology unit of Lady Reading Hospital, Peshawar from 16th July, 2019 to 16th Jan, 2019. Detailed history was taken from the patient and the container of the chemical ingested was examined to find out the duration since ingestion, amount of chemical ingested, and the type of chemical ingested (acid or alkali). **Results:** Mean and SD for age was 35 ± 5.55. Mean and SDs for duration since ingestion. Mean and SDs for amount of corrosive ingestion was 24 ± 1.54. 50 (34.48%) patients were recorded in 10-25 years' age group and 95 (65.51%) patients were recorded in 26-40 years' age group. 97 (66.89%) patients were male, and 48 (33.10%) patients were female. 41 (28.27%) patients had acidic corrosion and 104 (71.72%) patients had alkali corrosion. As per frequencies and percentages for stricture formation, 57 (39.31%) patients had stricture formation. **Conclusions:** Although the mortality and morbidity of corrosive gastric injuries is high, the key to improve the survival is early identification of perforation, maintenance of nutrition and control of sepsis.

## INTRODUCTION

Corrosive substances are defined as chemicals which cause injury upon coming in contact with living tissues such as the skin, gastrointestinal tract, respiratory tract and eyes. These include acids, alkalis, oxidizing agents, hydrocarbons among others. Ingestion of corrosive agents is an excruciating experience and represents an important public health problem. More than 5000 cases of caustic ingestion are reported annually in the United States with a majority being as a result of accidental ingestion in children [1, 2]. However, ingestion in adults is also common especially in psychiatric patients, alcoholics and those who attempt suicide [3]. The corrosive agents which are ingested are typically acids and alkalis and can result in serious injury to the upper gastrointestinal tract including the pharynx, esophagus and stomach [4]. The degree of injury depends on several factors such as the nature of the caustic substance (acid or alkali), the amount or concentration and the duration of contact [5]. Alkaline substances usually cause more serious injury as they are more palatable than acids and are therefore typically

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ingested in larger amounts. In addition, acids limit tissue damage because of coagulation necrosis and eschar formation while alkalis cause extensive tissue damage due to saponification of tissues [6]. The degree of injury is classified according to the depth. First-degree injuries are confined to the mucosa; second-degree burns extend to the submucosa while third-degree burns involve the entire thickness of the wall [7, 8]. The clinical presentation of caustic ingestion is variable, the most common serious complications being perforation and bleeding with a mortality rate of about 10-20% [9]. In patients who survive the acute stage, delayed complications include stricture and fistula formation, gastric outlet obstruction and an increased risk of malignancy, with esophageal stricture and gastric outlet obstruction being the most common. The frequency of esophageal stricture formation depends on the degree of burn and is about 90% for third-degree injuries and 30-70% for grade 2B injuries [10, 11]. Similarly, gastric outlet obstruction or stricture occurs in approximately 60% of patients with second or third-degree burns of the stomach [12]. An observational study of 50 patients with corrosive ingestion showed esophageal stricture formation in a total of 10 patients i.e., 20% (8 out of 43 patients with acid ingestion and 2 out of 7 patients with alkali ingestion) and gastric stricture formation in 20 patients i.e., 40% (19 out of 43 patients with acid ingestion and 1 out of 7 patients with alkali ingestion) [13]. Another study of 206 children to determine the outcome of caustic ingestion based on upper gastrointestinal endoscopy showed no statistically significant difference ($p = 0.32$) between the rate of development of esophageal stricture after acid ingestion (15.3%) and alkali ingestion (8.9%). The use of high doses of corticosteroids for the management of corrosive esophageal burns may prevent stricture development [14]. This study aims to find out the frequency of esophageal and gastric stricture formation following corrosive ingestion in our local population. This is because the commonly available poisons which are ingested most frequently vary from population to population and therefore the local frequency in our population might be different from that revealed by studies carried out in other populations. Also differences in factors like the time since ingestion till presentation to hospital might also lead to differences in rate of stricture formation. Therefore, my study will find out local data about the rate of stricture formation. This information will give an indication of the magnitude of the problem and will also help the health care professionals devise strategies in order to try and prevent stricture formation.

## METHODS

This cross-sectional study was held in the Gastroenterology unit of Lady Reading Hospital, Peshawar from 16 July 2019 to 16 Jan 2019. The sample size was 145 selected by non-probability consecutive sampling. It was calculated using the WHO software "Sample Size Determination in Health Studies". The formula for "Estimating a population proportion with specified absolute precision" has been used based on the following assumptions: Confidence Interval Strength: 95%. Absolute Precision (Margin of error): 8%. Anticipated frequency of gastric stricture formation in patients with corrosive ingestion: 40% [15]. All patients10-40 years old who present with ingestion of acid or alkali (assessed by inspecting the label on the container of the chemical ingested) capable of causing corrosive injury to the gastrointestinal tract to a minimum of 20 ml(determined by comparing the marking / fluid level of the chemical in the container before and after ingestion) during the previous 4 weeks were included. Patients who have completely vomited out the ingested caustic substance just after ingestion and patients with esophageal or gastric stricture secondary to a cause other than corrosive ingestion for example gastro esophageal reflux were excluded. The study was held after hospital ethical and research committee approval. The patients meeting the criteria of inclusion in the gastroenterology unit of Lady Reading Hospital, Peshawar was selected in the study after written informed consent (Annexure I). The purpose of the study and the benefits and risks was clarified to all the subjects right at the start of the study i.e. before recruitment. Detailed history was taken from the patient and the container of the chemical ingested was examined to find out the duration since ingestion, amount of chemical ingested and the type of chemical ingested (acid or alkali). The diagnosis of stricture formation was made at the time of endoscopy (which was done 4 weeks after the time of ingestion) grounded on the mentioned inclusion criteria in the operational definitions. All subjects were treated conferring to the standard care who present with corrosive ingestion. The data were entered and saved in SPSS version 23.0. The percentages and frequencies was calculated for qualitative / categorical variables such as gender, type of corrosive substance (acid/alkali) and presence/absence of stricture formation. 95 percent confidence intervals were calculated for the frequencies of stricture formation. Mean and S.D was calculated for the numerical / quantitative variables for example age, amount of corrosive ingested and duration since ingestion. The frequency of stricture formation was stratified according to gender, different age groups, duration of ingestion, amount of chemical ingested and the type of corrosive substance (acid or alkali). Post-stratification chi-squared test was applied in which a p value of ≤0.05 was considered

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significant. All results were presented in the form of tables and graphs.

## RESULTS

The overall Mean age was 35. Mean and SDs for duration since ingestion. Mean and SDs for amount of corrosive ingestion was 24 ± 1.54. (Table 1).

**Table 1:** Descriptive Statistics (N=145)

| Year | Mean |
|---|---|
| Age | 35 ± 5.555 |
| Duration since Ingestion | 3 ± 0.67 |
| Amount of chemical ingested | 24 ± 1.54 |

50 (34.48%) patients were recorded in 10-25 years' age group and 95 (65.51%) patients were recorded in 26-40 years age group. 97 (66.89%) patients were male, and 48 (33.10%) patients were female (Table 2).

**Table 2:** Age and gender's distribution (N=145)

| Age Group | Frequency (%) |
|---|---|
| 10-25 Years | 50(34.48) |
| 26-40 Years | 95(65.51) |
| **Gender** | |
| Male | 97(66.89) |
| Female | 48(33.10) |

41 (28.27%) patients had acidic corrosion and 104 (71.72%) patients had alkali corrosion (Table 3).

**Table 3:** Frequency and Percentages for Type of Corrosive Substance (N=145)

| Type of Corrosive Substance | Frequency (%) |
|---|---|
| Acidic | 41(28.27) |
| Alkali | 104(71.72) |
| Total | 145(100) |

As per frequencies and percentages for stricture formation, 57 (39.31%) patients had stricture formation (Table 4).

**Table 4:** Frequency and percentages for stricture formation (N=145)

| Stricture Formation | Frequency (%) |
|---|---|
| Present | 57(39.31) |
| Absent | 88(60.68) |
| Total | 145(100) |

Stratification of age, gender, duration of corrosive ingestion and amount of chemical ingested has been done at Table 5.

**Table 5:** Stratification of stricture formation with age, gender, duration of ingestion, and amount of chemical ingested (n=145)

| Variable | Stricture Formation | Frequency (%) | p-value |
|---|---|---|---|
| **Age** | | | |
| 10-25 Years | Present | 27(18.62) | 0.008 |
| | Absent | 23(15.86) | |
| 26-40 Years | Present | 30(20.68) | |
| | Absent | 65(44.82) | |
| **Gender** | | | |
| Male | Present | 35(24.13) | 0.257 |
| | Absent | 62(42.75) | |
| Female | Present | 22(15.17) | 0.257 |
| | Absent | 26(17.93) | |
| **Duration of Ingestion** | | | |
| < 2 Weeks | Present | 32(22.06) | 0.969 |
| | Absent | 37(25.51) | |
| >2 Weeks | Present | 25(17.24) | 0.969 |
| | Absent | 51(35.17) | |
| **Amount of Chemical Ingested** | | | |
| < 25 ml | Present | 50(34.42) | 0.813 |
| | Absent | 76(52.41) | |
| > 25 ml | Present | 07(4.82) | 0.813 |
| | Absent | 12(8.27) | |

## DISCUSSION

Corrosive substances are defined as chemicals which cause injury upon coming in contact with living tissues such as the skin, gastrointestinal tract, respiratory tract and eyes. These include acids, alkalis, oxidizing agents, hydrocarbons among others. Ingestion of corrosive agents is an excruciating experience and represents an important public health problem. Ingestion in adults is also common especially in psychiatric patients, alcoholics and those who attempt suicide. The effective therapy of corrosive injury requires early detection and treatment. Alas, despite all precautions, maintaining an esophageal lumen is not always possible. About 10-30% acoustic injury patients developed clinically visible esophageal strictures [16], and the rate was considerably higher in a previous study [17, 18]. Majority of patients had strictures that required to be replaced attributed to the significant amounts of caustic chemicals consumption for suicidal purpose. Management of esophageal strictures following damage was challenging, and dilatation was utilized in many hospitals [19]. Even after multiple dilations, strictures were found in approximately 48% of cases [20], and while the risk of severe complications, such as esophageal perforation, was low (0.9-1.5%) per procedure [21], numerous patients had higher risk of mortality [22]. Moreover, dilatation treatment necessitated numerous hospitalizations and various anesthetics with associated hazards [23]. It is still debatable that esophagus should be removed following colonic interposition. Several research have been conducted to investigate an association between cancer and esophageal damage. Although a higher risk of carcinoma was found in injured esophagus, no proof has been provided [24]. Earlier studies by Fan *et al.*, and Al-Hussaini *et al.*, utilized stomach, jejunum, and colon organs for esophageal replacement in patients with caustic burns [25, 26]. Long-term gastroesophageal reflux, ulceration, anastomosis, and increasing dysfunctional propulsion are

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all drawbacks of the stomach [27]. Just a few cases of jejunal interposition were conducted in our study due to the previously abdominal surgery and the colon and stomach were unable to be moved. With development of somatic and blood supply enhancement, replacement of esophageal related colon is long enough and produces esophagitis less late problems and acid resistance causing stricture. As a result, the colon may have benefits over other organs, and it is thought to be an excellent organ for replacement [28]. Treat a duodenal lesion is a challenging issue in the surgical therapy of caustic ingestion; decision making can be difficult in some circumstances, and every viable method entails risks and potential consequences. Severe lesions of the second section of the duodenum are generally treated conservatively, with the duodenal stump closed and several drainages from the duodenum area [29, 30]. The degree of the injury is determined by various factors, including the concentration of the substance, the amount consumed, the length of time the agent is in contact with the tissue, and the pH of the agent. Solid items attach easily to the mouth and throat, inflicting the most harm to these areas. Liquids, on the other hand, travel more swiftly via the mouth and throat, causing the most damage in the esophagus and stomach [31, 32].

## CONCLUSIONS

Although acute corrosive stomach injuries have a high morbidity and mortality rate, early detection of perforation, maintaining nutrition, and controlling sepsis are the keys to improving survival.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Factors Affecting on Dialysis Patients to Choose or Refuse Kidney Transplantation as Renal Replacement Therapy

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## ABSTRACT

Kidney transplantation (KT) is the most successful treatment for end-stage renal disease patients. But objective data about patients' willingness to undergo kidney transplant is still lacking in Pakistan. **Objective:** To assess barriers to KT and identify factors which could influence the willingness regarding KT among hemodialysis dependent patients. **Methods**: This cross-sectional study carried out at Dialysis Unit, Dept. of Urology and Kidney transplantation Lahore General Hospital, Lahore on 100 hemodialysis dependent patients by completion of structured questionnaire about their knowledge and attitudes toward KT and how satisfied they were with dialysis. **Results:** The mean age of the patients was 42.8 ± 10.6 years with 55% male and 45% female patients. The percentage of patients who were willing to get a kidney transplant was 60%. The main reason of unwillingness to undergo KT was lack of donor (83.3%). Motivating factors in patients to choose KT were vascular access constraints 75%, studies or work difficulties 70%, fluid and dietary restrictions account for 63.3%. The percentage of patients who wanted a deceased kidney for transplant was 50%, whereas the percentage of patients who preferred a living kidney for transplant was 25% (17% relatives and 8% non-relatives) and 25% of patients had no preference. **Conclusion**: Willingness to get kidney transplant is relatively low in Pakistan. Lack of donor, fear of surgery and financial problems are the main barriers for KT in ESRD patient.

## INTRODUCTION

Chronic kidney disease (CKD) is a developing public health problem worldwide. CKD is linked to high morbidity of patients and higher use of medical resources [1]. The overall prevalence of CKD is estimated to be around 13.4% [2] Patients often present with ESRD because in majority of patients, CKD remains undiagnosed [3]. The treatment of ESRD is either dialysis or renal transplant [4]. Depending on the source of the donor organ, kidney transplantation (KT) is normally categorized as either cadaveric (also known as deceased donor) or living donor transplantation [5]. For many ESRD patients, kidney transplantation (KT) is the preferred course of treatment since it improves quality of life and survival compared to permanent dialysis [6]. Moreover, transplantation therapy significantly lowers the overall cost of healthcare for society [7]. Different perspectives and understandings concerning chronic renal disease and its treatment exist among patients and their caregivers [8]. The choice of dialysis in terms of kidney replacement therapy seems to be influenced by patient education, whereas family plays a major role in decisions for transplantation, particularly living donation [9]. In addition to these factors, Other factors, such as ignorance of the necessity for kidney transplantation, may also have an impact on how acceptable it is to receive a

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kidney transplant. Despite the fact that kidney transplantation has been available in Pakistan since 1979, the vast majority of ESRD patients remain on hemodialysis. Since there is still a low level of acceptance for transplantation, it is necessary to evaluate patients' understanding of kidney transplantation as well as their perceptions of and willingness to embrace KT as a therapeutic option. Health care practitioners can better adapt patient education to have a favorable effect on patients' decision-making regarding transplantation by identifying the variables that affect a patient's willingness to choose kidney transplant as renal replacement therapy. Also, these will guide policy makers in developing policies that will address the elements that have a negative impact on patients' willingness to choose transplantation as a treatment of choice.

## METHODS

This cross-sectional study carried out at Department of Urology, Dialysis unit, Lahore General Hospital, Lahore on 100 participants receiving hemodialysis for end-stage renal disease. Non probability convenient sampling technique was used for sample selection. Patients with serious psychiatric illnesses that have been clinically identified, cognitive impairment, co-morbid terminal disease, and patients who are clinically unstable were excluded from the study. A structured questionnaire was completed by patients during their hemodialysis, which was included with questions regarding patients' demographics, knowledge about KT, motivational factors for KT, and barriers to KT. Collected data were analyzed through IBM SPSS 25.0. For qualitative data, the chi-square test was utilized, and for quantitative data, the paired T test.

## RESULTS

The mean age of the patients was 42.8 ± 10.6 years, range (25-60) years with 55% male and 45% females. Among study populations 80% were married and 20% were unmarried. Approximately 35% the patients had secondary and 35% tertiary education level. Two-third of the patients were unemployed and Two-third were related to Muslim religion. HTN was the most common co-morbid condition among patients (85%) (Table 1).

| Characteristic | Willing for KT(%) | Unwilling for KT(%) | Total study population(%) | p-value |
|---|---|---|---|---|
| Mean age (year ± SD) | 36.6±8 | 53±3.7 | 42.8 ± 10.6 | <0.001 |
| **Gender** | | | | |
| Male | 40(88.8) | 5(11.2) | 55% | <0.001 |
| Female | 20(50) | 20(50) | 45% | |
| **Marital status** | | | | |
| Married | 40(61.5) | 25(38.5) | 80% | 0.001 |
| Unmarried | 20(100) | 0(0) | 20% | |
| **Education** | | | | |
| Tertiary /Secondary | 45(69.2) | 20(30.8) | 76.5% | 0.620 |
| Primary/No formal education | 15(75) | 5(25) | 23.5% | |
| **Employment status** | | | | |
| Employed/Retired | 16(80) | 4(20) | 23.5% | 0.001 |
| Unemployed | 44(67.6) | 21(22.4) | 76.5% | |
| **Unemployment reason** | | | | |
| Don't want | 30(60) | 20(40) | 75% | 0.001 |
| Trying but not accepting | 20(100) | 0(0) | 25% | |
| **Religion** | | | | |
| Muslim | 45(75) | 15(25) | 75% | 0.167 |
| Christian | 15(60) | 10(40) | 25% | |
| **Duration of HD** | | | | |
| >3 Years | 35(77.7) | 10(22.3) | 52.9 % | 0.122 |
| <3Years | 25(50) | 15(50) | 47.05% | |
| **Co-morbid disease** | | | | |
| HTN | 55% | 20% | 85% | |
| DM | 15% | 15% | 35% | |
| Heart Disease | 0 | 5% | 5% | |

**Table 1:** Demographic details of included patients

Half of the patients had dialysis duration more than 3 years. The percentage of patients who were willing to choose kidney transplant were 60%, In remaining patients 25% were unwilling and 15% were not sure about acceptance of kidney transplant. The preferred source of kidney for them was deceased kidney (50%) (Figure 1).

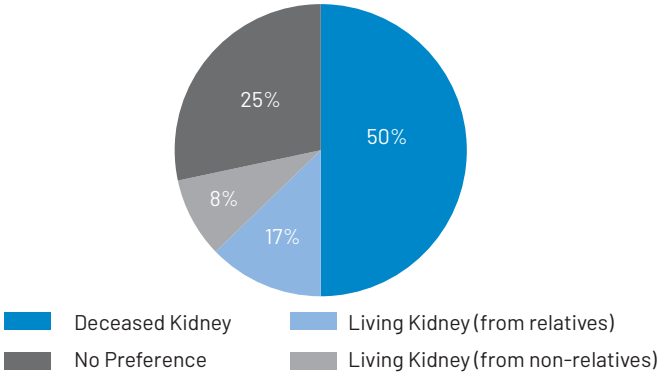


**Figure 1:** Preferred Source of Kidney

Two third of the patients had heard about kidney transplant from their physicians. Only 30% of patients were referred for KT, among them 5% patients had previous history of KT. Two third of the patients were aware about local transplant centers. Forty-five percent of the patients labeled their knowledge as average and 70% of the patients wanted to know more about KT (Table 2).

| Characteristic | Willing for KT(%) | Unwilling for KT(%) | Total study population(%) | p-value |
|---|---|---|---|---|
| **Heard about Renal transplant** | | | | |
| Yes | 60(72.3) | 23(27.7) | 94% | 0.034 |
| No | 0(0) | 2(100) | 6% | |
| **Treating physician discussed kidney transplant with patients** | | | | |
| Yes | 50(71.4) | 20(28.6) | 70% | 0.713 |
| No | 10(66.7) | 5(33.3) | 30% | |

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| Characteristic | Willing for KT(%) | Unwilling for KT(%) | Total study population(%) | p-value |
|---|---|---|---|---|
| **Ever referred for Kidney transplant evaluation** | | | | |
| Yes | 25(83.3) | 5(16.6) | 30% | 0.003 |
| No | 35(63.6) | 20(36.6) | 70% | |
| **Self-reported knowledge about KT** | | | | |
| Below average | 5(50) | 5(50) | 20% | 0.137 |
| Average | 30(66.7) | 15(33.3) | 45% | |
| Above average | 25(83.3) | 5(16.7) | 35% | |
| **Aware of any local transplant centers** | | | | |
| Yes | 46(71.4) | 17(28.6) | 70% | 0.074 |
| No | 14(36.6) | 8(26.4) | 30% | |
| **Want to know more about KT** | | | | |
| Yes | 60(96.7) | 2(3.3) | 67% | <0.001 |
| No | 0(0) | 20(100) | 20% | |
| Don't Know/Not sure | 0(0) | 3(100) | 13% | |
| **Is it possible for a living individual to give a kidney?** | | | | |
| Yes | 55(73.3) | 20(26.7) | 80% | 0.128 |
| No | 0(0) | 2(100) | 2% | |
| Don't Know/Not sure | 5(62.5) | 3(37.5) | 18% | |
| **After a kidney transplant, one's opinion on their quality of life** | | | | |
| Improve quality of life | 50(90.9) | 5(9.1) | 55% | <0.001 |
| Not improve quality of life/ Do not know | 10(33.3) | 20(66.7) | 45% | |

**Table 2:** Patients' knowledge of renal transplantation

Motivating factors in patients to choose KT were vascular access constraints (75%), study or work difficulties (70%), Fluid restrictions and diet constraints account for (63.3%), comorbidities of hemodialysis (43.3%), family wishes (43%), and constraints related to social aspects (11.6%) (Table 3).

| Characteristic | Willing for KT(%) | Total study population(%) |
|---|---|---|
| **Dietary / fluid restrictions** | | |
| Yes | 38(63.3) | 60% |
| No | 22(36.6) | 40% |
| **Problems with studies or at work** | | |
| Yes | 42(70) | 60% |
| No | 18(30) | 40% |
| **Wishes of family** | | |
| Yes | 25(41.6) | 33% |
| No | 35(58.3) | 67% |
| **Comorbidity of hemodialysis** | | |
| Yes | 26(43.3) | 40% |
| No | 34(56.6) | 60% |
| **Constraints of social aspect** | | |
| Yes | 7(11.6) | 8% |
| No | 53(88.3) | 92% |
| **constraints of vascular access** | | |
| Yes | 45(75) | 67% |
| No | 15(25) | 33% |

**Table 3:** Motivating factors that affect patients on hemodialysis' attitude regarding renal transplant

The reasons for not choosing KT as renal replacement therapy were lack of donor (83.3%), fear of transplant rejection and complication of surgery (76%), feeling of well-being (72%), financial constraints (40%) and trust on doctors 16% (Table 4).

| Characteristic | Willing for KT(%) | Total study population(%) |
|---|---|---|
| **I don't have donor in relatives (n=25)** | | |
| Not important/Somewhat important | 5(16.6%) | 20% |
| Important/Very important | 25(83.3%) | 80% |
| **I don't believe the physicians.** | | |
| Not important/Somewhat important | 21(84%) | 85% |
| Important/Very important | 4(16%) | 15% |
| **I need more time to think** | | |
| Not important/Somewhat important | 22(88%) | 85% |
| Important/Very important | 3(12%) | 15% |
| **Religious concerns** | | |
| Not important/Somewhat important | 25(100%) | 100% |
| Important/Very important | 0 | 0% |
| **Fear of surgery and Complications** | | |
| Not important/Somewhat important | 15(60%) | 70% |
| Important/Very important | 10(40%) | 30% |
| **Don't want somebody else organ in my body** | | |
| Not important/Somewhat important | 17(68%) | 90% |
| Important/Very important | 8(32%) | 10% |
| **I feel healthy on hemodialysis** | | |
| Not important/Somewhat important | 7(28%) | 65% |
| Important/Very important | 18(72%) | 35% |
| **Financial concerns** | | |
| Not important/Somewhat important | 10(60%) | 25% |
| Important/Very important | 15(40%) | 75% |
| **It takes more time to approve case from PHOTA** | | |
| Not important/Somewhat important | 25(100%) | 80% |
| Important/Very important | 0 | 20% |
| **Fear of transplant rejection** | | |
| Not important/Somewhat important | 6(24%) | 43% |
| Important/Very important | 19(76%) | 57% |
| **I am very weak** | | |
| Not important/Somewhat important | 20(80%) | 86% |
| Important/Very important | 5(20%) | 14% |

**Table 4:** Patients' perspectives on the obstacles to kidney transplantation

## DISCUSSION

Patients' interest is the first stage in deciding whether to have a kidney transplant or dialysis as a renal replacement therapy in ESRD patients. Our study focused on identifying factors that affect patient willingness to choose or not to choose renal transplantation. In our study 60% of the patients were willing to undergo renal transplant, less than what has been reported by Alansari et al. (69%) and Bioma et al (67.3%) [10, 11]. But more than what has been reported by Qiao et al (34.9%) and Qiling Tan et al (46.4%) [12, 13]. The observed differences are most likely the result of the study population's different nature, culture, and socioeconomic background. Deceased kidney was the preferred source in half of the patients that were willing to undergo KT in our study. The preference of deceased or living kidney are much different among studies in literature. In a study by Bioma et al the half the patient had no preference, 40% preferred living donor kidney and only 2% had preferred deceased kidney [11]. But the willingness for acceptance of

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deceased kidney was reported 80% in a study by Alobaidi et al [14]. In our study 85% patients were hypertensive and 35% were diabetic. The literature research also demonstrates that these two disorders are the leading causes of CKD, which validates the current study's findings [15, 16]. Three factors were discovered to positively influence patients' willingness to undergo transplantation from their demographic features: younger age, male gender and unmarried status. Older age of patients is regarded as a barrier to kidney transplantation. In our study most the patients willing to accept KT were younger than unwilling patients (36.6±8 Vs 53±3.7, p value<0.001). Findings from studies conducted in China and USA also showed that patients over the age of 60 were less willing to undergo kidney transplantation [12, 17]. In our study 50% of female patients and 88% of male patient were willing to accept KT. It was almost same for female and male respectively (63% and 70%) in a study by Bioma et al [11]. But it was reported much lower in study by Qiao et al. (20% Female, and 43% Male) [11]. Another important factor was marital status; we noticed that being single positively affects willingness to undergo kidney transplantation. The similar result was observed in a study conducted in Morocco by Kabbali et al. revealed that being single and male had positive impact on willingness [17]. In contrast, the study conducted in Saudi Arabia by Alansari et al demonstrated that being married positively affects willingness toward KT [10]. Other elements that impacted patients' willingness positively to accept KT in our study were desire to learn more about KT, perception of improved quality of life with renal transplant, prior knowledge about KT, and referral for transplant evaluation. These results demonstrate potentially modifiable characteristics related to hemodialysis patients to accept kidney transplantation. For instance, prior knowledge and feeling to know more about KT are important factors. All of the patients who had not heard about kidney transplantation and did not want to learn more about it were unwilling to undergo KT. In our study who had prior knowledge about KT 72% were willing, and 97% of who wanted to learn more were willing for KT. In a study by Bioma et al in Ghana reported the similar results for prior knowledge (73% were willing) but 77% of patients wanted to learn more about KT were willing for transplantation [11]. In our study, when compared those who replied that (kidney transplantation improved quality of life), with individuals who answered that (transplant doesn't improve quality of life or did not know) were three times more willing to get a kidney transplant. The results of our study on perception of quality of life after kidney transplant are similar to the results documented by Bioma et al [11]. In our study only 30% patients are referred for transplant evaluation, willingness is higher in referred patients (83.3%) than non-referred patients (63.3%). These results of referral are similar to findings of Bioma etal. (30%) [11]. But better than Ilori et al (only 4%) [18] and worse than that reported in Saudi Arabia by Alobaidi et al (55.7%) [14]. Dialysis patients have limited access to kidney transplant because referral for transplant evaluation is very low. While referral for evaluation is the preliminary step toward transplantation. In our study among motivating factors vascular access constraints were most common and family wishes and Social aspect constraints were least common, which is distinct from the results of Qaio et al study, in which Studies or work difficulties were common constraints [13]. Among our study population who were not willing for kidney transplant, lack of donor (83.3%), fear of transplant rejection and complication of surgery (76%), feeling of well-being (72%) and financial constraints (40%) were major barriers to accept kidney transplantation. Due to lack of local deceased program and non-allowance of non-relative living donors, patients are completely reliant on relative live donors for kidney transplant. In additions due to lack of knowledge and anxiety about failure and complications of surgery patients avoiding kidney transplantation. In studies conducted in Ghana and China showed fear of complications and financial concerns as main barriers of kidney transplantation in CKD patients [11, 19] But studies conducted in Saudi Arabia and Brunei showed lack of donors as main barrier in ESRD patients to undergo transplantation [14, 20].

## CONCLUSIONS

The proportion of ESRD patients in Pakistan, who are willing for kidney transplant, are relatively low in Pakistan. Lack of donor, fear of surgery and complications and financial problems are the main barriers in patients, who are willing to accept kidney transplant. Stringent donor criteria resulted in the donor pool's shortage.

## Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

# Frequency of CRP Levels in Patients Presenting with Acute Coronary Syndrome

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## ABSTRACT

Myocardial necrosis is thought to be the etiology of acute coronary syndrome (ACS) and elevated CRP levels in the first 12 hours after an intervention is linked to a higher risk of cardiovascular recurrence and death. **Objectives:** To evaluate if CRP has any predictive value in predicting cardiovascular outcomes in ACS patients. **Methods:** We conducted a cross-sectional study at Jinnah Post Graduate Medical Centre from Oct 2021 to March 2022. 117 patients of both gender aged between 40 to 80 years, presenting with chest pain were included in the study. Data were analyzed on SPSS Version 25. Chi-square was used to compare the outcomes of both groups. The age and gender were stratified to control the effect modifiers. The p-value of <0.05 was considered significant. **Results:** There were a total of 117 patients enrolled in this study. Among them, there were 63 (53.85%) males, and 79 (67.52%) were above 60 years of age. There were 90(76.92%) patients who had a raised CRP level, and 78(66.67%) had a duration of ACS > 12 hours. Differences between the duration of elevated CRP and non-elevated CRP were statistically significant (p-value = 0.013). **Conclusions:** CRP levels may be indicative of suspected acute coronary syndrome. Physicians can identify such patients and provide them with more intensive health care and cardiac management. Resources are scarce in the developing world. Having such tools that are more economical can help with the diagnosis and provide better care.

## INTRODUCTION

Cardiovascular disease (CVD) is the chief cause of mortality worldwide. The developed world has shown progress but CVD now shows a deteriorating trend. They observed that the death rate due to CVD was anticipated to nearly increase twofold in low and middle-income nations [1]. People without hyperlipidemia are responsible for roughly half of all heart attacks and strokes. New risk assessment methods are being developed to help identify people at risk earlier. C-reactive protein (CRP) has been classified as a significant marker to assess the outcomes of cardiovascular diseases [2]. The term "acute coronary syndrome" (ACS) includes unstable angina (UA), Non-ST-segment elevation myocardial infarction (NSTEMI), and St-segment elevation (STEMI) which is usually caused by atherosclerosis leading to coronary thrombosis [3]. Patients with ACS have an elevated probability of suffering from subsequent cardiac events [4]. Atherosclerosis results in acute ischemic syndromes including acute MI, unstable angina, and sudden death due to coronary plaque disruption leading to platelet aggregation and thrombosis [5]. There has been increasing evidence of atherosclerosis being an inflammatory process and the literature has

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started assessing multiple plasma markers of inflammation as a probable tool to predict the probability of experiencing coronary events [6]. These inflammatory markets include homocysteine, serum amyloid A, fibrinogen levels, interleukin- 6, lipoprotein (a), apolipoprotein- A, fibrinolytic capacity, apolipoprotein B-100, and CRP [7]. It has been noted among patients suffering from unstable angina and myocardial infarction (MI), that there are increased concentrations of CRP [8, 9]. Zhang with his team of researchers has reported that the CRP levels along with serum amyloid A level in unstable angina tend to elevate whether there has been a myocardial cell injury or not. They also highlighted that at the time of hospital admission, the raised levels of CRP (>3.0 mg/l) were highly predictive of the worst outcome in ACS patients [10]. Therefore, we conducted the following study aiming to determine the significance of CRP in predicting cardiovascular outcomes in patients presenting with the features of ACS.

## METHODS

A total of 117 patients were included in this cross-sectional study conducted at the Cardiology Department of Jinnah Post Graduate Medical Centre from Oct 2021 to March 2022. The calculation of the sample size was done by the WHO sample size calculator where Alpha=5%, power of test 1beta=90, by taking the percentage of ACS patients to be 54.7% [11]. The sample size of 117 patients was calculated for the study. The sampling technique used for the data collection was the non-probability consecutive sampling technique. All patients, either sex, between 40 to 80 years of age, presenting with chest pain were included in the study. All those patients who did not permit to be included in this trial were excluded. Patients with a history of pneumonia, tuberculosis, Arthritis, Asthma, and chronic pulmonary disease (COPD) were excluded. Data collection were done after obtaining approval from the ethics review committee. Consenting patients visiting the Department of Cardiology, Jinnah Post Graduate Medical Centre. A brief history of demographic information and written informed consent was taken from each patient. The findings of quantitative variables and qualitative variables were entered into the study's questionnaire. The diagnosis of the ACS was made with the help of the following criteria: increased chest discomfort (VAS 5) for more than 20 minutes and not relieved by nitroglycerin or rest is an indication of STEMI. If the levels of Troponin I are greater than or equal to 0.01 ng/mL and the ECG shows indications of STEMI, then the patient has a positive test. A fresh or suspected new left bundle branch block (LBBB) appears on the initial electrocardiogram (ECG). NSTEMI: chest pain lasting more than 20 minutes and not eased by rest or nitroglycerin. Negative Trop-I with a level greater than 0.01 ng/mL but no ECG abnormalities that would indicate STEMI. Angina that lasts more than 20 minutes and isn't relieved by rest or nitroglycerin is known as unstable angina. Data were analyzed on SPSS Version 25.0. For the categorical data, the frequencies and percentages were calculated. The chi-square was applied to assess the relationship between the outcomes of both groups. Effect modifiers were controlled through stratification of age, and gender. After doing the stratification chi-square test was done considering a p-value of ≤ 0.05 as statistically significant.

## RESULTS

There was a total of 117 patients enrolled in this study. Among them, there were 63 (53.85%) males, and 79 (67.52%) were above 60 years of age. In our study 95 (81.20%) lived in an urban setting. There were 76 (64.96%) who did not smoke. There were 85 (72.65%) patients who had a raised CRP level, 58 (49.57%) had anemia, 74 (63.25%) had dyslipidemia, 91 (77.78%) had hypertension, 81 (69.23%) had diabetes mellitus, and 78 (66.67%) had a duration of ACS > 12 hours, as shown in Table 1.

| Variables | n (%) |
|---|---|
| **Age** | |
| 40 to 60 years | 38 (32.48) |
| 61 to 80 years | 79 (67.52) |
| **Gender** | |
| Male | 63 (53.85) |
| Female | 54 (46.15) |
| **Residence status** | |
| Urban | 95 (81.20) |
| Rural | 22 (18.80) |
| **Duration of ACS** | |
| < 12 hours | 39 (33.33) |
| >12 hours | 78 (66.67) |
| **Diabetes Mellitus** | |
| Yes | 81 (69.23) |
| No | 36 (30.77) |
| **Hypertension** | |
| Yes | 91 (77.78) |
| No | 26 (22.22) |
| **Dyslipidemia** | |
| Yes | 74 (63.25) |
| No | 43 (36.75) |
| **Smoking status** | |
| Yes | 41 (35.04) |
| No | 76 (64.96) |
| **Obesity** | |
| Yes | 49 (41.88) |
| No | 68 (58.12) |
| **Anemia** | |
| Yes | 58(49.57) |
| No | 59(50.43) |
| **Status of CRP** | |
| Raised | 85 (72.65) |
| Not raised | 32 (27.35) |
| Total | 117 (100) |

**Table 1:** Benefits of Organization Diversity [9]

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Age, gender, diabetes, hypertension, dyslipidemia, anemia, and obesity were not found to be statistically different when the data were stratified based on CRP levels (p-value>0.05). However, the statistically significant difference between the duration of ACS and high CRP (p-value = 0.013) is relevant. Patients with raised CRP were found in 87.18 percent of the cases, whereas those with non-elevated CRP were found in 12 percent of the cases. In contrast, 51 (65.38%) patients with increased CRP had an ACS duration of fewer than 12 hours, while 27 (34.62%) had an ACS duration of more than 12 hours. A 74.98% shift occurred in just under 12 hours. In the first 12 hours, the proportional difference was 74.36%; in the second 12 hours, the proportional difference was 30.76%. When the data were stratified according to the length of the ACS, the CRP levels were shown to be statistically different (p-value = 0.013), while the distribution of patients by age group was not (p-value = 0.53). There was no statistically significant difference in the length of time spent in ACS between patients with and without diabetes (p-value = 0.201). When we looked at the duration of ACS, there was no statistically significant difference in the state of hypertension, dyslipidemia, obesity, or anemia (p-value>0.05), as shown in Table 2.

| Variables | Elevated CRP n(%) | Not elevated CRP n(%) | p- value |
|---|---|---|---|
| | **Age** | | |
| 40 to 60 years | 29 (76.32) | 9 (23.68) | 0.53 |
| 61 to 80 years | 56 (70.89) | 23 (29.11) | |
| | **Gender** | | |
| Male | 44 (69.84) | 19 (30.16) | 0.46 |
| Female | 41 (75.93) | 13 (24.07) | |
| | **Residence status** | | |
| Urban | 75 (78.95) | 20 (21.05) | 0.28 |
| Rural | 15 (68.18) | 7 (31.82) | |
| | **Duration of ACS** | | |
| < 12 hours | 34 (87.18) | 5 (12.82) | 0.013 |
| >12 hours | 51 (65.38) | 27 (34.62) | |
| | **Diabetes Mellitus** | | |
| Yes | 56 (69.14) | 25 (30.86) | 0.201 |
| No | 29 (80.56) | 7 (19.44) | |
| | **Hypertension** | | |
| Yes | 68 (74.73) | 23 (25.27) | 0.346 |
| No | 17 (65.38) | 9 (34.62) | |
| | **Dyslipidemia** | | |
| Yes | 52 (70.27) | 22 (29.73). | 0.449 |
| No | 33 (76.74) | 10 (23.26) | |
| | **Smoking status** | | |
| Yes | 34 (82.93) | 7 (17.07) | 0.067 |
| No | 51 (67.11) | 25 (32.89) | |
| | **Obesity** | | |
| Yes | 37 (75.51) | 12 (24.49) | 0.556 |
| No | 48 (70.59) | 20 (29.41) | |
| | **Anemia** | | |
| Yes | 41 (70.69) | 17 (29.31) | 0.637 |
| No | 44 (74.58) | 15 (25.42) | |

**Table 2:** Distribution of patient characteristics according to the CRP groups

## DISCUSSION

In our research, we noted that there were 34 (87.18%) patients with elevated CRP and there were 5 (12.82%) patients in the non-elevated CRP group who had ACS duration of ≤12 hours. On the other hand, there were 51 (65.38%) patients with elevated CRP who had a duration of ⩾12 hours and 27 (34.62%) patients who had an ACS duration of ⩾12 hours and no elevated levels of CRP. The proportion of subjects with elevated CRP was much higher (87.18%) among those with acute ACS, as compared to the duration > 12 hours where 65.38% of patients had elevated CRP (p-value = 0.013). The difference in proportion was 74.36% in ≤ 12 hours however the difference in proportion was 30.76% in the > 12 hours group. Our findings are consistent with those of Li *et al.*, and Yuksel *et al.*, in that they indicate a similar trend [12, 13]. In all investigations, people with acute coronary syndromes had greater CRP levels than control subjects within the first several hours after the onset of symptoms. CRP levels are elevated in the early stages of coronary artery disease (ACS), which is thought to be caused by the inflammatory process. In a study by Chew *et al.*, CRP levels are shown to predict the chances of death or myocardial infarction within 30 days in those patients who were undergoing percutaneous coronary intervention [14]. In one of the studies, the CRP levels were found to be higher in patients who were smokers, diabetics, and obese [15]. Similar was found in our study as well however the association is not significant. The literature implies that an inflammatory response increases a patient's risk of ischemia-induced damage consequences, including heart failure . For those who are at risk of developing congestive heart failure after a cardiac arrest, increased levels of CRP may help to identify them. As a result, doctors might devote more time and energy to treating individuals like these. Knowledge gained from testing CRP at the time of hospital admission helps to identify those patients who are most likely to develop heart failure and die [3]. The literature related to the variability in the levels of CRP is quite controversial [16-18]. In a study conducted by Kavsak *et al.*, the raised concentration of CRP levels predicted heart failure and death despite being independent of the patient's gender, age, and raised troponin concentrations [19]. The findings of Morrow *et al.*, were however opposite. They reported the rise of CRP levels in parallel to the muscle necrosis level which peaks around day 2 following the myocardial infarction (MI) and then drops [20]. In our study as well, a greater number of patients reported the raised CRP within 12 hours of the MI episode. To reduce the inflammatory effects, statin therapy can be used as recent trials have revealed statin therapy to be quite effective in lowering CRP levels [21-23].

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Zhang *et al.*, conducted a study in which increased CRP levels were found to be linked to poor patient outcomes. Another study, on the other hand, found that high CRP levels are not caused by coronary artery disease. The rise in CRP levels in patients with the acute coronary syndrome may therefore be attributed to inflammation. These increased levels are linked to poor patient outcomes [10, 11].

## CONCLUSIONS

We conclude that CRP levels are important biomarkers to predict the episode of the acute coronary syndrome. It is mostly elevated in the acute phase so it should be also measured in the hospital setups while assessing patients for acute coronary syndrome to avoid unfavorable outcomes.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Frequency of Hepatitis B and C and its Risk Factors in Pregnant Women Presenting at Jinnah Postgraduate Medical Center, Karachi

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## ABSTRACT

Hepatitis B and C are the most common infections throughout the world. Both viral infections in pregnancy have serious implications, including increasing the risk of chronic infection, perinatal transmission, accelerated liver damage. **Objective:** To identify the frequency of hepatitis B and C in pregnant women as well as the risk factors that contribute to these infections. **Methods:** A Cross-sectional study was conducted at Department of Gynecology and Obstetrics, Jinnah Postgraduate Medical Center (JPMC), Karachi from 10th July 2022 till 10th December 2022. After taking a verbal consent data were collected from 332 patients who met the diagnostic criteria. Quantitative data were presented as simple descriptive statistics using mean and standard deviation, whereas frequency and percentages were used for qualitative variables. Effect modifiers were controlled through stratification to see the effect of these on the outcome variable. chi square test was applied after stratification with p-value of ≤0.05 considered significant. **Results:** Mean age and gestational age was 33.41 ± 7.59 years and 38.24 ± 1.77 weeks respectively. Hepatitis B and C was found in 20.5% and 14.5% respectively. Most common risk factors are use of injections and various surgical procedure followed by blood transfusion, tattooing and multiple sexual partners is least common factors. **Conclusions:** The study indicated the high frequency of hepatitis B and C virus infection among pregnant women. HBV and HCV infection were associated with histories of injections, surgeries, and blood transfusions.

## INTRODUCTION

A serious issue with world health is viral hepatitis. Viral hepatitis is thought to have been the cause of 1.34 million fatalities worldwide [1]. According to behavioral, environmental, and agent factors, prevalence varies from country to country [2]. 96% of hepatitis mortality was brought on by the HBV and HCV viruses alone [3]. Untreated hepatitis B and C virus infections can result in malignancy and liver cirrhosis, both of which require lifelong treatment [4]. There is a considerable risk of maternal problems when viral hepatitis occurs during pregnancy [5]. Fetal and neonatal hepatitis, which can have major consequences for the neonate and result in compromised mental and physical health later in life, is caused by a high rate of vertical transmission [6]. Pregnant women are advised to undergo routine testing for hepatitis B surface antigen (HBsAg) [7]. HBV and HCV are spread initially through the transfusion of blood and blood products, surgical and dental procedures, contaminated syringes, needles, and other sharp objects, and sexual contact (>3%), and then vertical transmission (5%). Hepatitis B and C can be transmitted through sexual contact [8, 9]. The HCV burden worldwide is concentrated about 80% in those with poor and middle incomes [10]. After Egypt, Pakistan has the second-highest HCV prevalence (5%) in the world [11]. According to a national survey, the prevalence of HBV and HCV in the general population was 2.5% and 4.9%, respectively [12]. The purpose of the study is to find out how common hepatitis B and C are in pregnant women in order to provide a local viewpoint because a review of the literature from both international and local studies

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revealed that prevalence was variable. The findings of this study offered clinicians new information that may have an impact on clinical practice.

## METHODS

This cross-sectional study was carried out from10th July 2022 till 10th Dec2022 at the Department of Gynecology and Obstetrics, Jinnah Postgraduate Medical Center (JPMC), Karachi after approval from the institutional ethical review committee. Using WHO sample size calculator, the required sample size was determined to be 332 patients by using the hepatitis C prevalence of 8.5%, a margin of error of 3%, and a confidence level of 95% [13]. The study included all pregnant women between 20 to 40 years with confirmation of pregnancy by dating scan. Using non-probability consecutive sampling technique, researcher collected a brief history of the demographics and risk factors for hepatitis. Patients with histories of HIV, tuberculosis, acute liver failure, hepatocellular carcinoma, hypo- or hyperthyroidism, congestive heart failure, asthma, chronic renal failure, chronic obstructive pulmonary disease, and stroke were excluded. The researcher took blood sample, and then transported the sample to a hospital-based laboratory for hepatitis B and C screening using the ELISA method. The researcher gathered the reporting and entered it into Performa. Data analysis was done on SPSS Version 20.0. Means and standard deviations used for simple descriptive statistics including maternal age, parity, gravidity, gestational age and demographic data. Frequencies and percentages were computed for prevalence of hepatitis B and C positive cases. The stratification of mother age, gravidity, parity, family monthly income, educational attainment, and employment position allowed for the control of effect modifiers. Effect modifiers were controlled through stratification to see the effect of these on the outcome variable. Chi square test was applied after stratification with p-value of ≤0.05 considered significant.

## RESULTS

Patients' ages ranged from 20 to 40, with 20 being the lowest and 40 being the highest. In our study, the average age and gestational age were 33.41 7.59 years and 38.24 1.77 weeks, respectively. Out of 332 patients, hepatitis B and hepatitis C was found in 68 (20.5%) and 48 (14.5%) respectively as showed in figure 1. None of the females had HBV and HCV co-infections.

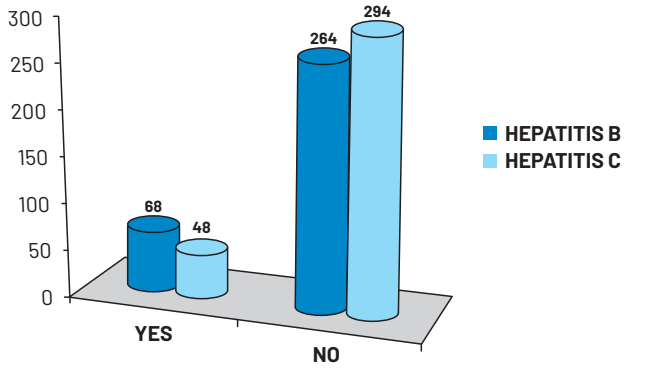


**Figure 1:** Hepatitis B and C seropositive cases distribution

Table 1 shows the prevalence of HBV and HCV infection in association to sociodemographic characteristics (age, parity, income, education and occupational status) of pregnant women.

| Variables | Hepatitis B | | | Hepatitis C | | |
|---|---|---|---|---|---|---|
| | Yes | No | p-value | Yes | No | p-value |
| **Age (years)** | | | | | | |
| 20-30 | 32 (47.1%) | 87 (33%) | 0.02 | 18 (37.5%) | 101 (35.6%) | 0.45 |
| 31-40 | 36 (52.9%) | 177 (67%) | | 30 (62.5%) | 183 (64.4%) | |
| **Parity** | | | | | | |
| Primi | 38 (55.9%) | 72 (27.3%) | 0.00 | 27 (56.2%) | 83 (29.2%) | 0.00 |
| Multi | 30 (44.1%) | 192 (72.7%) | | 21 (43.8%) | 201 (70.8%) | |
| **Income** | | | | | | |
| Lower income | 00 (00%) | 29 (11%) | 0.00 | 00 (00%) | 29 (10.2%) | 0.03 |
| Lower middle income | 12 (17.6%) | 74 (28%) | | 12 (25%) | 74 (26.1%) | |
| Middle income | 50 (73.5%) | 123 (46.6%) | | 33 (68.8%) | 140 (49.3%) | |
| Upper Middle income | 06 (8.8%) | 26 (9.8%) | | 03 (6.2%) | 29 (10.2%) | |
| Upper income. | 00 (00%) | 12 (4.5%) | | 00 (00%) | 12 (4.2%) | |
| **Education** | | | | | | |
| Illiterate | 00 (00%) | 17 (6.4%) | 0.00 | 00 (00%) | 17 (6%) | 0.00 |
| Primary | 00 (00%) | 33 (12.5%) | | 00 (00%) | 33 (11.6%) | |
| Secondary | 44 (64.7%) | 75 (28.4%) | | 27 (56.2%) | 92 (32.4%) | |
| Higher | 24 (35.3%) | 139 (52.7%) | | 21 (43.8%) | 142 (50%) | |
| **Occupational status** | | | | | | |
| Employed | 15 (22.1%) | 104 (39.4%) | 0.00 | 09 (18.8%) | 110 (38.7%) | 0.00 |
| Unemployed | 53 (77.9%) | 160 (60.6%) | | 39 (81.2%) | 174 (61.3%) | |

**Table 1:** Prevalence of HBV and HCV infection in association to sociodemographic characteristics of pregnant women

The majority of patients had a dental history, as shown in table 2. 56 people (16.9%) had previously received intravenous injections. 09 people (2.7%) had access to medical care. 15 (4.5%) had previously had more than one sexual relationship.

| Risk factors | Frequency (%) |
|---|---|
| Dental procedure | 116(35) |
| Blood transfusion | 32(9.60) |
| Jaundice | 68(20.50) |
| Tattooing | 15(4.50) |
| Intravenous drips, injections, needle prick | 56(16.90) |
| Operation | 56(16.90) |
| Multiple sexual partner | 15(4.50) |

**Table 2:** Analysis of risk factors and HBV and HCV infection among pregnant women

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## DISCUSSION

Globally, viral hepatitis poses a serious health risk [14]. Pakistan's situation is worse than that of the world's industrialized nations. A recent national assessment on the prevalence of hepatitis B and C in Pakistan's overall population was done by the Pakistan Medical Research Council (PMRC) showed that there were 12 million people in Pakistan are infected, according to the 7.4% total positivity rate for both viruses [1-3, 5, 10]. In our study hepatitis C was found in 14.5%. This frequency is close to and consistent with a prior study from Karachi that found that 13.3% of expectant mothers had HCV [15]. In our study the prevalence of HCV was higher than that among pregnant women in Quetta (0.6%) and Egypt (6.1%) in the earlier study [16, 17]. However, compared to our study, a previously reported prevalence for Hepatitis C of 40% in pregnant women was extremely high. According to our research, 20.5% of pregnant females had HBV. Our results, however, are higher than those of other local and international research (2.1%, 3.2%, 4.5%, and 5%) [18-21]. According to our research, the average age and gestational age were 33.41 ± 7.59 years and 38.24 ± 1.77 weeks, respectively. In a different study by Arshad and Ashfaq, the participants' average age was 27 (SD ± 4.75 years) [22]. The WHO recommends screening of pregnant women for HBV routinely and universal access to HBV vaccine to 90% by 2030 to minimize vertical transmission due to lack of hepatitis B vaccination [23]. When compared to other studies that were carried out globally, our study's findings which revealed that 20.5% of pregnant women were HBV positive are rather significant. Numerous research conducted in many nations have shown inconsistent results, ranging from 1 to 7.1%. [1, 3]. Our results vary depending on the location of Pakistan, ranging from 1.16% to 23.25% [24]. Several risk factors for hepatitis B virus infection are investigated in this study. The most common hepatitis B risk factors were identified to be having a history of dental procedures, using intravenous drugs, and undergoing various kinds of surgical procedures similar to other research [25]. This can be the result of inadequate tool sterilization and insufficient infection control. Blood donors had a 0.62% and 0.96% prevalence of anti-HCV and HBsAg, respectively. In our analysis, as has been reported by others, blood transfusion was among the other most prevalent risk factors linked to hepatitis B and C infection [26]. This suggests that both infections could be spread by blood transfusion with insufficient screening. Hepatitis B prevalence was found to be connected with sexual risk behaviors, although our study revealed that it is not as widespread as in other nations. Our study have shown that tattooing history can transmit hepatitis similar to other [27]. Similar to Saleem *et al.*, study, multivariate analysis revealed that low parity and education below the secondary level were substantially linked with anti-HCV seropositivity [28]. It is possible to do screening during the antepartum period, and those who are found to have hepatitis C during that time can receive the appropriate therapy. Women can be treated and followed up on throughout the postpartum period for both self-care and avoidance of future pregnancies.

## CONCLUSIONS

Hepatitis B and C virus infection is very common in pregnant women according to this study. Blood transfusion history, jaundice, tattooing, and having several partners were all linked to HBV and HCV infection.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Frequency of Iron Deficiency Anemia and its Association with Persistent Diarrhea, Weight and Parasitic Infestation in Children, 1-2 Years of Age in Semi-Rural Area of District Sialkot, Pakistan

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## ABSTRACT

Iron deficiency anemia (IDA) is a common health problem in Pakistan and persistent diarrhea under two years of age is one of its major reasons. **Objectives:** To determine the frequency of IDA among children 1-2 years of age and to find its association with persistent diarrhea and parasitic infestation. **Methods:** In this hospital-based study, 345 children 1-2 years of age visiting OPD of Tehsil Headquarter Hospital, with persistent diarrhea were included. Socio-demographic characteristics of children and their parents collected with the questionnaire while total body iron stores determined by checking Hemoglobin (Hb), Serum Ferritin and Total Iron Binding Capacity (TIBC) in the blood while parasitic infestation was determined by Ova and Cyst in the stool samples. Chi-square test was used to test association. **Results:** Out of total children, 55.9% children were bottle fed, weaning was started among 97.7% children at the age of 6 months, 44.9% had weight <8 kg, 53.0% children were anemic, had TIBC >450 µg/dl and serum ferritin level <7 ng/ml. The association of IDA with age, gender, mode of feeding, food allergies and vaccination history were significant while it was insignificant with persistent diarrhea and parasitic infestation. **Conclusions:** Study concluded that IDA was very frequent among children in less than 2 years of age and among contributing factors, lack of beast-feeding and diarrhea are important. Correlation was significant between IDA with age and feeding mode while association was insignificant with persistent diarrhea and parasitic infestation.

## INTRODUCTION

In IDA (iron deficiency anemia) in which hemoglobin synthesis within bone marrow is limited resulting in low hemoglobin in blood is a leading public health issues and is prevalent in both industrialized and developing countries [1]. Any person with serum ferritin <12 ng/ml and with Hb levels less than 11g/dl is declared as iron deficient. Prevalence of IDA in developing and developed countries is 50- 60% and 10-20%, respectively. It is a 3rd significant cause for disability and among thirteen major risk determinants regarding disability adjusted life years. Majority of the IDA burden is found in resource poor areas of Asia and Africa [2, 3]. The global prevalence of anemia among children 6 to 59 months old is 43 % while half is associated with IDA. According to WHO global database on anemia, 50.9% of Pakistani children were found to be anemic. Pakistan shows different IDA prevalence rates 34%, 73% and 41% [4-6]. Iron deficiency anemia has adverse impacts on mental growth leading to poor educational accomplishments and work capability reducing the earning capability and damaging the country financial growth in coming future. In addition to that, it also enhances the chances of complications and death caused by contagious disease [7, 8]. The associated diarrhea results in loss of appetite, significant weight loss, vomiting,

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blood passage and fever. The ensuing outpouring of the plasma, blood, mucous and serum proteins enhances fecal volume and liquid content. Prolonged diarrhea could lead to anemia in children [9]. A study carried out among refugee Palestinian children demonstrated that diarrhea episode was related to an enhanced risk of IDA. While another study suggested that anemia was a significant cause for diarrheal disease. So, this relationship is reciprocal. It is probable that diarrhea enhances the development of anemia while anemia in reciprocate, enhances the diarrhea [2, 9]. In still another study, infections caused by parasites are held responsible for diarrheal diseases [10]. As individual tests commonly used for finding iron status in the body have some limitations because of their reduced specificity or sensitivity, therefore, various iron status markers when combine provide optimum evaluation regarding iron status [11]. Although complete blood count indicate low levels of Hb but Serum ferritin reflects total body iron stores [4]. Current study aim was to determine the frequency of diarrhea and the resultant IDA by assessment of hemoglobin, serum ferritin and TIBC in blood and to find the association of iron deficiency anemia with persistent diarrhea, low weight and parasitic infestation.

## METHODS

It was cross-sectional hospital-based study. The study was carried out in Pediatric Department of Tehsil Head Quarter Hospital, Daska, District Sialkot. Nonprobability convenient sampling was used. Sample size was 345. It was calculated by following formula using prevalence of iron deficiency anemia i.e. 34% in Pakistan with confidence level 95% and absolute precision of 5% by following formula:

$$n = \frac{Z^2 xp(1-p)}{d^2}$$

All patients 1-2 years of age with persistent diarrhea with grade II or more stool and whose parents/attendants were willing to participate were included in the study. Patients with co-morbid conditions like cardiac, renal disease, pneumonia, meningitis, sepsis with abdominal distension and malnutrition were not included. The mother/attendant, accompanying child was interviewed by the researcher with the help of a semi-structured questionnaire to know the demographic and socioeconomic characteristics of respondents and duration of breast feeding. Questionnaire was pretested and modified before the start of interviews. Weight of child was noted with the help of weighing machine to know failure to thrive (grow). Blood sample of the child was taken for assessment of Hemoglobin (Hb), Serum Ferritin and TIBC to know the level of TBI stores. Stool samples were taken for the assessment of Ova and Cyst to find out worm infestation. Iron-deficiency anemia (IDA) was labeled when the serum ferritin level and hemoglobin level was <12 ng/ml and <11 g/dl, respectively [12]. Parasite infestation is considered when stool test was positive for ova or cyst [13]. Diarrhea was labelled when there was passage of three or more loose or liquid stools per day and persistent Diarrhea when there was acute episodes of diarrhea that lasted for 14 days or longer [14]. Grading of stools was done as follows: [15]. Grade I with normal formed stools. Grade II with soft stools. Grade III with liquid stools taking shape of the container. Grade IV with watery stools with flakes, appears opaque in glass container. Grade V with watery stools with few flakes, appears translucent in container. Data were entered, cleaned and analyzed in SPSS version 20.0. Indirect variable was iron deficiency anemia and direct variables included age, monthly income, mother's education, family type, mode of feeding, weaning, worm infestation, weight of child and anemia.

## RESULTS

Socio-demographic characteristics (Table 1) showed that among 345 children, 176 (51.0%) were 1-year old. The mean age of the children was 1.341 ± 0.38 years. More than half 203 (58.8%) were male and 142(41.2%) were females. Majority 295 (85.5%) had family monthly income up to Rs. 20,000, 245(71.0%) mothers were housewives / unemployed, 108 (31.3%) mothers studied up to grade 10 while 55 (16.0%) mothers were illiterate while 231 (67.0%) of children were living in extended family system. Only 89 (25.8%) were on breast feeding, in majority 337 (97.7%), weaning was started at the age of 6 months. Majority 291 (84.4%) was fully vaccinated.

| Age | Frequency (%) |
|---|---|
| 1 year | 176(51) |
| 1.5 years (13-18 months) | 103(29.9) |
| 2 years (19-24 months) | 66(19.1) |
| Mean ± SD | 1.341 ± 0.38 |
| **Gender** | |
| Male | 203(58.8) |
| Female | 142(41.2) |
| Mean ± SD | 20000.40 ± 6645.30 |
| **Family monthly income in Pak rupee** | |
| Up to 20,000 | 295 (85.5) |
| >20,000 | 50(14.5) |
| **Occupation of mother** | |
| Professional | 17(4.9) |
| Housewife/unemployed | 245(71) |
| Skilled worker | 83(24.1) |
| **Education of mother** | |
| Postgraduate | 6(1.7) |
| Graduate | 25(7.2) |
| Intermediate | 31(9) |

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| | |
|---|---|
| Up to grade 10 | 108(31.3) |
| Up to grade 8 | 87(25.2) |
| Up to grade 5 | 33(9.6) |
| Illiterate | 55(16) |
| **Family type** | |
| Nuclear | 114(33) |
| Extended | 231(67) |
| **Mode of feeding** | |
| Breast feeding | 89(25.8) |
| Bottle feeding | 193(55.9) |
| Both | 63(18.3) |
| **Weaning started** | |
| 4 months | 8(2.3) |
| 6 months | 337(97.7) |
| **Vaccination history** | |
| Fully vaccinated | 291(84.4) |
| Partially vaccinated | 29(8.4) |
| Unvaccinated | 25(7.2) |
| **Weight** | |
| <8 kg | 155(44.9) |
| 8-10 kg | 177(51.3) |
| 11-12 kg | 13(3.8) |

**Table 1:** Socio-demographic characteristics of children

Regarding associated signs/symptoms and hydration status (Table 2), majority 263 (76.2%) had fever, followed by vomiting in 149 (43.2%). blood in stool in 35 (10.1%) and cough in 16 (4.6%). Hydration status showed that mild dehydration was observed in 271 (78.6%) while severe dehydration in 13 (3.8%) children. In addition to that weight loss was noted in 36 (10.4%) children.

| Symptoms associated with diarrhea | Frequency (%) |
|---|---|
| Fever | 263(76.2) |
| Vomiting | 149(43.2) |
| Cough | 16(4.6) |
| Blood in stool on history | 35(10.1) |
| Dehydration | 271(78.6) |
| **Physical examination** | |
| Pallor | 169(49) |
| **Hydration status** | |
| No dehydration | 74(21.4) |
| Some dehydration | 258(74.8) |
| Severe dehydration | 13(3.8) |
| Weight loss | 36(10.4) |

**Table 2:** Symptoms associated with diarrhea

According to lab investigations (Table 3), more than half 183 (53.0%) children were anemic (hemoglobin <11 g/dl), 183 (53.0%) had TIBC >450 µg/dl and 162 (47.0%) children had TIBC ≤450 µg/dl (normal). Serum ferritin level <7 ng/ml was noted in 183 (53.0%), Only 3 (0.9%) children had worm infestation on stool examination. Result showed that out of 176 children, prevalence of iron deficiency anemia who were 1 year old was. Similarly, it was 17.1% and 13% in children 1-1.6 years and 2 years old, respectively.

| Lab investigations | Frequency (%) |
|---|---|
| **Hemoglobin** | |
| <11 g/dl (anemia) | 183(53) |
| >11 g/dl (normal) | 162(47) |
| **Total iron binding capacity** | |
| >450 µg/dl | 183(53) |
| <450 µg/dl (normal) | 162(47) |
| **Serum ferritin level** | |
| <7 ng/ml | 183(53) |
| >7 ng/ml (normal: 7-140) | 162(47) |
| Worm infestation (stool examination) | 3(0.9) |
| **Anemia** | |
| 1 Year | 79(22.9) |
| 1-< 1.6 years | 59(17.1) |
| 1.6 - 2 Years | 45(13) |

**Table 3:** Lab investigations in patients

Association of IDA with different variables (Table 4) showed that p –value .003 was significant with age while it was insignificant (.391,.172, .903, .588,.348 and .635) in income of family, education of mother and type of family, weaning age, weight and parasitic infestation, respectively. However, it was significant (p-value .028, food allergy (p-value .000) with mode of feeding and food allergy, respectively.

| Variables | Characteristics | Iron deficiency anemia (IDA) (%) | p-value |
|---|---|---|---|
| Age | ≤1 | 79(22.9%) | .003 |
| | 13-18 months | 59(17.1%) | |
| | 19-24 months | 45(13.0%) | |
| Income | Up to Rs 20,000 | 149(43.2%) | .391 |
| Education of mother | Literate | 153(44.3%) | .172 |
| Type of family | Extended | 122(35.3%) | .903 |
| Mode of feeding | Breast feeding | 37(10.7%) | .028 |
| | Bottle feeding | 107(31.0%) | |
| Weaning started | 4 months | 5(1.4%) | .588 |
| | 6 months | 178(51.6%) | |
| Food allergy | Yes | 147(42.6%) | .000 |
| Weight | <8 kg | 85 (24.6%) | .348 |
| Parasitic infestation | Yes | 2 (0.6%) | .635 |

**Table 4:** Association of IDA with different variables

## DISCUSSION

Iron deficiency anemia is a leading health problem among children in both industrialized and developing countries. Current study revealed that more than half of the children (51.0%) were one-year old, result matched with study conducted by Maroof *et al.*, who reported that (74.9%) were one year old while only one fourth (25.1%) children were up to 2 years old [16]. Regarding male to female ratio, male children were effected more than female but Ahmad *et al.*, reported in their study that most of the children were females. Similarly, Abdel-Rasoul *et al.*, also confirmed in their study that female children were more (51.3%) than

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male children (48.7%). Reason of this difference might be conservative society in their study areas. People usually do not care female children in most of the communities [11] High family monthly income is usually reflected by improved child health as it indirectly prevents children from numerous infectious diseases including anemia and diarrhea. This study also revealed that significant majority of children had family monthly income up-to PKR 20,000 per month (Table-1) while the results of a study undertaken by Ahmad *et al.*, did not favor this. Reason of this discrepancy is that present study was carried out in semi-urban area where most of the people were poor [17]. Like family monthly income, education, profession of mother and family type were also linked with child health. This study showed that most of the mothers were literate, a result matched with Dagnew *et al.*, study. This study also showed that majority of mothers were housewives while Dagnew *et al.*, reported that almost 44.8% mothers were employed. Reason again was that study area in the present study was located in semi urban and rural area where women are mostly house wife. It is culture of rural society that women were generally discouraged to go out of the house and work [18]. Role of extended family system is also important because it is mostly observed that children who belonged to extended family system did not get better care. Present study indicated that almost three fourth of the children were living in extended family system. Similar results were reported by Din and fellows who confirmed that 63 % children were living in extended family system [19]. Breast feeding is very beneficial for children as it protects them from several diseases. It was very encouraging to note that almost half of the children were bottle fed but a study carried out by Dagnew *et al.*, elucidated that only 16.7% children were breast fed. Reason of this could be that culture of the study area is conservative where women in the lactating stage are encouraged to feed their children from breast milk. In addition to that poor socioeconomic conditions compelled them not to purchase costly formula milk. Weaning is the most significant transitional period for babies because they start tasting and eating of food during this period. In the present study, weaning was started at 6 months among majority of children. Dagnew *et al.*, also confirmed that among majority (71.2%) weaning was started at 6 months [18]. Vaccination status of children was also assessed and found that most of the children were fully vaccinated. Similar results were published by Wangusi *et al.*, [8]. It is due to the fact that Extended Program of Immunization in the study area is working amicably. As far as history of diarrhea is concerned, study showed that all children were admitted to hospital when the duration of diarrhea was more than 14 days and the numbers of stools were 8-12 per day. Similar results were published by Qadri *et al.*, who highlighted that duration of diarrhea in children was 14 days with > 6 stool daily [20]. Results of this study are comparable with other studies regarding dehydration, fever and vomiting associated with diarrhea [21, 22]. This study indicated that almost half (47.0%) children had normal Hb, TIBC and Serum Ferritin levels, a finding better than the study undertaken by Chandyo *et al.*, who reported that 43.0% children had normal level of Hb and serum ferritin. However, a study carried out by Darlan and colleagues highlighted that more than half (58.3%) of the children had normal TIBC level [23, 24]. In this study, very few (0.9%) children had worm infestation on stool examination while the study done by Javaid *et al.*, confirmed that 17.2% children were found positive for worm infestation on stool examination. Reason of this discrepancy might be due to non-availability of proper stool samples in the present study. It was very appalling to note that in this study that Iron Deficiency Anemia (IDA) was prevalent in almost half (53.0%) children but the study reported that only 25.6% children had IDA. Another study undertaken by Darlan and colleagues elucidated that iron deficiency anemia was prevalent in only 7.6% children. Decreased level of IDA in these studies might be due to better nutritional status of children [24, 25]. When the association between socio-demographic characteristics and IDA was assessed, study found significant with age and gender ($p < 0.05$) while insignificant association found with monthly income, mother occupation, mother education and family type ($p > 0.05$). However, study carried out by Abdel-Rasoul and his partners showed significant association ($p < 0.05$) with mother education but insignificant association with child gender ($p > 0.05$). Results of another study performed by Howard *et al.*, showed significant association with child age, gender and mother education ($p < 0.05$) [11, 9]. It is also worth mention here that association between nutritional history and IDA in the present study was insignificant with mode of feeding and time of weaning. A study carried out by Woldie and coworkers also found insignificant association between time of weaning started and IDA [7]. Similarly in this study, significant association was observed with vaccination status ($p < 0.05$), but a study carried out by Murye *et al.*, showed insignificant association with vaccination ($p > 0.05$) [21]. Study further disclosed that there was no significant association regarding persistent diarrhea, weight of child, parasitic infestation and iron deficiency anemia ($p > 0.05$). Similar results were reported by Darlan and colleagues [24].

## CONCLUSIONS

Iron Deficiency Anemia was prevalent among more than

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half of the children correlation was significant between IDA with age and feeding mode while association was insignificant with persistent diarrhea, low weight and parasitic infestation. Further studies are needed on large scale regarding same topic.

## Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

# Knowledge Assessment Regarding Nasogastric (Ng) Tube Insertion Guidelines Among Nurses in District Headquarters Hospital Toba Tek Singh

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## ABSTRACT

Inserting a nasogastric tube in most countries, is the responsibility of the nursing profession. To ensure patient safety and avoid complications, nurses must first understand what they know and do when inserting nasogastric tubes into sick patients. As a result, the nurse must have the necessary knowledge and abilities for tube insertion and verification. **Objective:** To assess the knowledge regarding Nasogastric (NG) Tube insertion guidelines among nurses. **Methods:** Descriptive cross-sectional research design was utilized in the current study. A total of 105 nurses were selected for this study. Modified form of questionnaire were utilized to collect data. Data was analyzed by using (SPSS) version-22. Frequency distribution tables and graphs were used to describe the results of study. **Results:** The result finding shows that knowledge for all nurses in this study as regards Nasogastric (NG) Tube was unsatisfactory 65.7% while only 34.3 % with a satisfactory knowledge. The educational level is directory co-related with the knowledge level. Those who have a degree level education score more than diploma level with a p equal to 0.01. **Conclusions:** Knowledge level of nurses regarding NG tube insertion guidelines was found unsatisfactory. It is the most important thing for nurses to know the nasogastric tube guidelines because then they can provide effective care to the patients, and by following the nasogastric tube guidelines nurses can improve their everyday practice.

## INTRODUCTION

A nasogastric tube is a long polyurethane or silicon tube that is inserted through the nasal passage and into the stomach via the esophagus. They are frequently used in surgical practice for a variety of reasons [1]. There are numerous types of nasogastric tubes. In the hospital, there are two major types of NGT tubes. The main distinction between these two types is the number of lumens present in the tube [2]. Serious complications can occur if the tube is misplaced into the lung. NG tubes are used for therapeutic and diagnostic purposes and are typically used for 48-72 hours [3]. These complications include pneumothorax, which can occur if the tube enters the larynx or trachea. The presence of a nasogastric tube in the nose for an extended period of time can damage the cilliary epithelium and cause infection, which can lead to sinusitis. The tube can also coil up in the throat. Perforation of the piriform sinus can result in retropharyngeal abscess. If the patient has a pre-existing esophageal disease, such as an unrecognized diverticulum of the esophagus, perforation of the esophagus may occur [4]. Nurses, junior doctors, and anesthetists insert nasogastric tubes in the operating room. It is critical that the personnel inserting them understand the proper insertion technique as well as the procedure for verifying their correct positioning [5]. According to a National Health Service report, nasogastric tubes are widely used in the United Kingdom [6]; but it has

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been linked to complications such as pneumothorax, aspiration by proxy, aspiration pneumonia, lung abscess, pleural effusion, empyema, and esophageal perforation [7]. According to a Retrospective study about 13 case notes across 10 hospital wards showed that the majority of NG Tubes took place on the stroke unit [8]. The most common error in NG Tube placement is tube placement into the respiratory tract. Rates of respiratory placement for blind insertion are commonly reported to be between 1 and 3% [9]. The agency expressed concern this week that unreliable tests were being used by health professionals to determine whether a tube had been properly inserted [10]. Additional reports of 21 deaths and 79 cases had been submitted to the National Reporting and Learning System (NRLS) tube is now necessary to deliver nutrition or medication in hospital wards and intensive care [11]. If the nurse uses the NG tube improperly and uses it for feeding or suctioning while it is located incorrectly, the patient may experience serious complications. The number of these tubes used annually, the deaths and complications that could have been avoided, tube. I went over the nursing care for NG tubes. About 13.3% of nurses in Pakistan were found to have knowledge of equipment use and other nursing care techniques. This is the general level of care in the hospital setting in the rural and district care unit, even though the knowledge level might not be an exact reflection of the insertion of the nasogastric tube [12]. Therefore, there is need to find out the knowledge level of nurses in a district level hospital about NG tube insertions guidelines.

## METHODS

Descriptive cross-sectional research conducted in District Headquarters Hospital Toba Tek Singh**.** Selected participants were all staff nurse, having at least one year experience and have practice the procedure one time while those nurses how didn't work in Intensive care unit, all those having master's degree in nursing were excluded from the study. The Calculated sample size was purposive sample of 105 bedside nurses. Calculated through open epi software by using confidence interval of 95%, margin of error 5%, population proportion 350 and percentage 10.9 (10.9% critical care nurses had an overall adequate level of knowledge. To collect data for the current study, a Modified form questionnaire was used with a content validity 0.73 and reliability with Cronbach's alpha 0.81. Nurses' knowledge questionnaire schedule about nasogastric insertion It covers three main parts which are Pre insertion, during insertion and post insertion. The knowledge score examined using 15 questions, with a point value of one for each correct response and zero for each incorrect response. Two categories the participants score 9-15 mean Satisfactory Knowledge > 60% and if score less than < 9 mean is considered Unsatisfactory Knowledge: <60%. Data were analyzed by using frequency table and chi-square test with a significance less than 0.05.

## RESULTS

Table 1 show the sample distribution based on demographic data, as shown that (79%) of the studied participants were between the age of 21 and 30, 18.1% were between 31 and 40, and only 2.9% were between the age of 41 and 50 year. On the base of gender 56.2% were female and 43.8% were males. In terms of marital status, 58.1% were single and 41.9% were married. According to job experience, 65.7% have 1 to 3 years, 4 to 6 years with 24.8%, and 7 to 9 with 9.5%. On the basis of education, 36.2% held a diploma, 33.3% a Registered Nurse (RN), and 30.5% a Bachelor of Science in Nursing (BSN).

**Table 1:** Demographic variable of staff nurses

| Variables | | Frequency (%) |
|---|---|---|
| Age | 21-30 | 83(79) |
| | 31-40 | 19(18.1) |
| | 41-50 | 3(2.9) |
| Gender | Female | 59(56.2) |
| | Male | 46(43.8) |
| Marital Status | single | 61(58.1) |
| | Married | 44(41.9) |
| Job Experiences | 1-3 Year | 69(65.7) |
| | 4-6 Year | 26(24.8) |
| | 7-9 Year | 10(9.5) |
| Educational level | Diploma | 38(36.2) |
| | BSN | 32(30.5) |
| | Post RN | 35(33.3) |

Analyzed by frequency (n) and percentage (%)

Table 2 showed total Knowledge Distribution as a Percentage Scores for Nasogastric (NG) About 69 (65.7%) had unsatisfactory knowledge with a score less than, while 36(34.3%) had satisfactory knowledge with a score greater than nine. The reported average score mean is 8.14, with a standard deviation (S.D) of 1.89, indicating that the majority of the participants score less than 9. It means that the majority of nurses had inadequate knowledge regarding NG tube insertion guidelines.

**Table 2:** Knowledge of Staff Nurses regarding NG Tube

| Knowledge Level | N (%) | Mean ± SD |
|---|---|---|
| Unsatisfactory score <9 | 69(65.7) | 8.14 ± 1.89 |
| Satisfactory score 9-15 | 36(34.3) | |

Table 3 showed that there was a significance association between the education level of participants and knowledge level with p equal to 0.01. The participants having a diploma about 32 score less than 9 and 6 participants with satisfactory knowledge score greater than 9. While the degree holder who had BSN 17 with unsatisfactory and 15

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were with satisfactory score out up 32 participants; and those who hold Post RN degree 20 were fall in unsatisfactory while 15 score satisfactory knowledge. Its means that educational level is directory co-related with the knowledge level. Those who have a degree level education score more than diploma level with a p<0.05.

**Table 3:** Knowledge Gap among Nurses regarding NG tube insertion Guideline

| Educational level | Unsatisfactory knowledge (Less than 9) | Satisfactory Knowledge (9-15) | Total | df | p-Value |
|---|---|---|---|---|---|
| Diploma | 32 | 6 | 38 | 2 | 0.01 |
| BSN | 17 | 15 | 32 | | |
| Post RN | 20 | 15 | 35 | | |

Analyzed by Chi-squared test with p<0.05, CI: 95% and d:5%

## DISCUSSION

This study reported that most of the nurses 79% were in young age 21 to 30 years, female 56.2% single 58.1% with job experience 1 to 3 year 65.7% and with 36.2% hold nursing diploma on the base of education. This result was supported by Hassan study found that three-quarters of the participants in the study were female, with more than half of them being between the ages of 25 and 35, and one-quarter being between the ages of 35 and 45 [13]. More than half of them are diploma nurses with more than ten years of experience. This study finding revealed that average score was 8.14 ± 1.89 indicating that the majority of the participants score less than 9. It means that the majority of nurses about 65.7% had inadequate knowledge regarding NG tube insertion guidelines. Similarly, the study of Mohammed Reported most of nurses were not aware about study revealed that the nurses knowledge about NG tube was 54.3% (Poor), followed by those who have 37.1% (fair) knowledge [14]. Furthermore, the finding of Mahmoud study showed that most of the nurses had low level of knowledge on the Nasogastric (NG) Tube [15]. The majority of nurses, however, were unaware of the contraindications of the Nasogastric (NG) Tube. According to Ceruti *et al.*, study majority of nurses lack of knowledge about NG tube insertion guidelines [16]. However, the study of Alhassan *et al.*, show that nurse's knowledge towards insertion of the nasogastric tube indicated good knowledge [4]. The majority of 98 people (82%) were aware of the factors to consider when choosing the size of the nasogastric tube, which included the patient's age, weight, health, and diagnosis. These 78 (94%) were also aware that the proper placement of the tube may be determined by aspiration of the stomach contents. Similarly, the majority of nurses had adequate knowledge of the Nasogastric (NG) Tube [17]. Additionally, the finding of Sari *et al.*, study reported that most of the nurses know about the indications for the Nasogastric (NG) Tube [7]. According to Fan *et al.*, and Chauhan *et al.*, if the nurse do not know the guidelines this lack of knowledge would result in resistance, time waste, and poor health care delivery [18, 19]. Another author said that Nurses should always seek correct knowledge on the insertion of an NG tube because the guideline updated time to time [20]. Similarly study discovered that nurses were unsure about the proper methods of confirming tube position, with the outdated bubbling test being one of the tests they used due to unaware about the new techniques and updated guidelines [21]. The current study recommended that continuous education and training sessions about the NG Tube be provided. This includes knowledge about the nasogastric tube, the steps of insertion, and how to check tube placement based on evidence, as well as the provision of nurses and critical care units with printed universal guidelines simply in posters and booklets related to the NG Tube.

## CONCLUSIONS

The current study concluded that their knowledge level of the nurses regarding NG tube insertion guidelines were 65.7% with unsatisfactory and 34.3% with satisfactory knowledge score. Furthermore, there was a significant association between the education level of participants and knowledge level; those who hold BSN and Post RN degree score more than diploma holders with a p<0.05. This lack of nursing knowledge and incorrect information causes numerous hazards in practice, such as tube inserting and conforming, because incorrect inserting can result in numerous complications and misplacement, which may result in death or dangerous complications.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Necrotizing Enterocolitis in Preterm Neonates: Prognostic Factors and Outcome

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## ABSTRACT

Necrotizing Enterocolitis (NEC) contributes significantly to a high neonatal death rate in Pakistan and other developing countries. A number of elements related to its development are modifiable and can be addressed. **Objectives:** To evaluate the frequency of NEC, its associated factors and outcome in preterm babies. **Methods:** This retrospective, cross-sectional study was conducted at Ziauddin University Hospital, Karachi. Medical records of admitted preterm newborns from 1st December 2020 till 1st December 2022 were reviewed and neonates meeting the modified Bell's diagnostic criteria ,with NEC stage II and III were included. Data pertaining to antenatal period, delivery and postnatal course of the disease were recorded . Data analysis were done using SPSS version-20 and results expressed as frequencies and percentages. Chi square test was applied with p-value statistical significance set at <0.05. **Results:** The prevalence of NEC was observed to be 7.1%. Male to female ratio was 1.6:1 with 84.5% of the neonates being low birth weight and culture-proven sepsis present in 44.8%. The mortality rate was 32.7%. Thrombocytopenia, hypotension, formula feeds, a positive blood culture and invasive ventilation were significant risk factors for mortality (p-value 0.01) **Conclusions:** Necrotizing enterocolitis has a high prevalence and mortality in preemies. Sepsis, formula feeding and a low birth weight adversely affect outcome. Early diagnosis and timely intervention can improve survival.

## INTRODUCTION

Necrotizing enterocolitis (NEC) is a serious life-threatening condition occurring in neonates and characterized by bowel ischemia, necrosis and multisystem organ failure. NEC is associated with increasing morbidity and mortality [1]. It is considered a common gastrointestinal emergency in newborns especially those born prematurely. The cause of this condition is multifactorial and functional immaturity of the intestine has been implicated in its pathogenesis [2]. Microbial dysbiosis plays an important role in the pathogenesis of NEC. Research studies have reported significant differences in gut microbiota composition between low birth weight and normal birth weight infants as well as between infants with and without NEC. The risk factors that have been reported in literature include prematurity, small for gestational age (SGA), hypoxic –ischemic injury, early and rapid advancement of enteral feeds, formula feeding and bacterial overgrowth [3]. However, among many causative factors, prematurity, low birth weight and formula feeding in preterm neonates are the most consistently recorded risk factors. Breast milk as compared to formula milk is nutritious so, it is recommended that enteral feeding with human milk be introduced as soon as possible to reduce the risk of infection throughout the body of neonates [4]. A confirmed

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diagnosis of NEC is based on the modified Bell's criteria, which includes clinical signs and symptoms like abdominal distension, vomiting, orogastric tube (OGT) residue and presence of at least one radiologic anomaly, such as pneumatosis intestinalis, gas in the portal vein, or pneumoperitoneum [1]. The prognosis and the management of affected neonates is considerably affected by the severity of NEC as indicated by Bell's stages II and III being present in neonates with proven or advanced NEC respectively [3]. Although the prevalence of NEC varies among centers, recent studies report up to 9000 cases in the United states every year with a mortality rate of 15% to 30% [5]. In a study by Sharma *et al.*, the frequency of NEC among preterm neonates was 8.3% [6]. Other studies have reported the rate of NEC-associated mortality to be greater than 10% overall and more than 25% for infants with NEC severe enough to require surgical intervention [7]. A study reported a prevalence rate of 26.8% for very low birth weight neonates with NEC and a very high mortality rate of 53.38% [8]. Therefore, it is emphasized that a timely diagnosis and management of NEC is imperative for better outcomes. A number of factors, some of which are debatable, increase a preemie's risk of acquiring the disease. As a result, developing novel strategies to stop the emergence and spread of NEC becomes difficult. In developing countries, there are only a few research studies regarding the local contextual elements involved in the development of NEC [9]. Multicenter research on a larger scale should be performed to develop efficient preventive, diagnostic and treatment strategies. Furthermore, the development of a national registry in this regard is imperative [10]. The rationale of our research was to evaluate the influencing factors of NEC in preemies and thus provide an insight into a better implementation of preventive strategies. Since premature births are common in our society, an effective treatment modality needs be adopted to reduce the prevalence of necrotizing enterocolitis and to reduce the burden of this condition on the already meagre resources [8].

## METHODS

It was a retrospective cross-sectional research undertaken at the Ziauddin hospital . Records of premature babies admitted during 1st December 2020 till 1st December 2022 were reviewed and preemies with the confirmed diagnosis of necrotizing enterocolitis (NEC) who remained in the neonatal intensive care unit (NICU) for more than 72 hours were included .Only those neonates having NEC stages II and III were made part of the study. All records of preterm neonates with NEC having insufficient data, who were discharged before 72 hours of age, had abdominal distention or emesis at the time of admission, those with other gastrointestinal disorders e.g., meconium ileus, with congenital malformations were excluded. Neonates in whom a confirmed diagnosis of NEC was made were considered confirmed cases based on the Modified Bell's diagnostic criteria that includes the presence of clinical features e.g. vomiting, orogastric residue, abdominal distension , laboratory findings of thrombocytopenia , blood in stool and the presence of at least one radiologic abnormality, such as intramural bowel gas, portal venous gas ,or pneumoperitoneum. All preterm neonates diagnosed as having confirmed NEC were followed during the course of disease while they were admitted. Final outcome with regards to recovery , discharge , referral to other hospitals for treatment or death were recorded. ERC approval was sought for the study (Reference code: 6600223SEPED). The data were entered on a pre-designed proforma that recorded newborn factors such as gender, weight, gestational age, appearance, pulse, grimace, activity, respiration score (Apgar), mode of delivery, perinatal asphyxia, use of antenatal steroids, information regarding enteral feeding with human milk feed or formula as well as clinical features and treatment instituted whether conservative or surgical and the outcome were recorded. The proforma was pretested before actual study and necessary changes made to maximize the reliability and confidentiality of the data. Finally, the data were examined for completeness by the principal investigator. Data were entered and analyzed using SPSS version-20.0. Qualitative data were expressed as mean and standard deviation and quantitative data as frequencies and percentages. Chi-square was applied for categorical variables. p-value of $<0.05$ was taken as significant.

## RESULTS

The frequency of NEC in our study was 7.1% , as 812 neonates were admitted in the neonatal intensive care unit (NICU) during the study period and 58 were diagnosed as having confirmed NEC. It was noted that 37 (63.8%) had NEC stage II A, 12(20.7%) NEC stage IIB, NEC stage IIIA was present in 6 (10.3%) and stage III B in 3 (5.2%). Out of the 58 neonates with NEC, 36 (62.1%) were male and 22 (37.9%) females, with a male to female ratio of 1.6:1. Majority of the newborns 41 (70.7%) were delivered through caesarian section. The mean age at initiation of signs and symptoms of NEC was 8.2 ± 4 (range 5-26 days). Average gestational age was 28.2 ± 3.2 weeks (27-36), 67% of them were < 32 weeks, the average weight was 1325 ± 260 grams (940 - 2250). In majority of newborns i.e. 32 (55.2%) enteral feeds were started within three days of admission. Average time of initiation of feed was 3.5 ± 1.72 days ( 2- 16 days). Distribution of the study population according to clinical characteristics is shown in table 1.

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**Table 1:** Clinical characteristics of preterm neonates with NEC

| Characteristics | Range | N (%) |
|---|---|---|
| Birth weight (grams) | < 1000 | 5 (8.6) |
| | 1100-1500 | 29 (50) |
| | 1600-2000 | 12 (20.7) |
| | 2100-2400 | 8 (13.8) |
| | >2400 | 4 (6.9) |
| Gestational age (weeks) | 27-29 | 18 (31) |
| | 30-33 | 31(53.4) |
| | 34-36 | 9 (15.5) |
| Sepsis | | 26 (44.8) |
| Vaginal delivery | | 17 (29.3) |
| Formula feeding | | 39 (67.2) |
| Apgar score < 7 at 5 min | | 16 (27.6) |
| Antenatal glucocorticoid | | 42 (72.4) |
| Patent ductus arteriosus | | 4 (6.9) |
| Perinatal asphyxia | | 8 (13.8) |
| Mechanical ventilation | | 24 (41.3) |
| Umbilical arterial catheter | | 19 (32.8) |
| Exchange transfusion | | 4 (6.9) |
| H2 blockers use | | 16 (27.6) |
| Prolonged (≥5 days) first course of antibiotics | | 26 (44.8) |
| Blood transfusions | | 15 (25.9) |
| Respiratory distress syndrome | | 24 (41.4) |
| Thrombocytopenia | | 39 (67.2) |
| Maternal hypertensive disease | | 19 (32.8) |
| Polycythemia | | 11 (19) |
| Cyanotic congenital heart disease | | 5 (8.6) |

Majority of the neonates i.e., 49 (84.5%) were low birth weight and 69.7% weighed less than 1500 grams, 18(31%) had respiratory distress syndrome (RDS) ,15 (25.9%) was transfused blood, Invasive ventilation was used in 24 (41.3%), while in 12 (20.7%) intravenous immunoglobulins were administered. The mean Apgar score at 1 and 5 minutes was 6.5 ± 2.1 (3-8) and 8.2 ± 2.8 (5-9) respectively. Table 2 shows the frequency of type of feeding in the study population.

**Table 2:** Distribution of the study population according to type of feeding

| Type of enteral feed | NEC stage II | NEC stage III | Total N (%) |
|---|---|---|---|
| Human milk | 13 | 1 | 14 (24.1) |
| Formula milk | 21 | 4 | 25 (43.1) |
| Nil | 6 | 1 | 7 (12.1) |
| Both | 9 | 3 | 12 (20.7) |
| Total | 49 | 9 | 58 (100) |

Thrombocytopenia was present in 31(53.4%) neonates with NEC . Abdominal distention was the commonest symptom observed in 64%, followed by bilious vomiting in 36% while apnea was present in 32% and hypotension requiring inotropic support was recorded in 32.8% of the neonates. It was observed that in those neonates who expired, apneic episodes were present in 44% and hypotension requiring inotropic support in 84.2 %. Blood culture revealed bacterial growth in 26 (44.8%) neonates. Gram-negative bacteria were the commonest bacterial isolates in 23 (88.5%) with *Klebsiella* isolated in 11(42.3%), Acinetobacter in 6(23.1%), Pseudomonas aeruginosa in 4 (15.4) and Escherichia coli in 2 (7.7%). Gram -positive bacteria were isolated in only 3 (11.5%) blood culture specimens and staphylococcus aureus was the isolate in all of them. It was observed that low birth weight, advanced NEC stage, formula milk feeding, a positive blood culture, invasive ventilation, thrombocytopenia and hypotension were significantly associated with increased mortality in newborns (p-value 0.01 ,0.01, 0.01 ,0.02 ,0.01,0.01, 0.03 respectively). Thrombocytopenia was present in 15(78.9% ) of the expired preterm babies with NEC and 94% of neonates with NEC stage III. Table 3 shows the general characteristics of preterm neonates who survived and those who expired.

**Table 3:** Characteristics of survival group versus expiry group of study population

| Characteristics | Survived | Expired | p-value |
|---|---|---|---|
| Birth weight (grams) | 2250 ±241 | 1678±315 | 0.01 |
| Male | 24 | 12 | 0.09 |
| Gestational Age (weeks) | 33.46± 2.35 | 30.65 ± 3.46 | 0.03 |
| Age at NEC onset (days) | 9.47 ±5.30 | 10.58±6.37 | 0.09 |
| Perinatal asphyxia | 15 | 3 | 0.71 |
| H2 blocker | 10 | 2 | 0.92 |
| Blood transfusion | 12 | 3 | 0.54 |
| **APGAR score** | | | |
| 1min | 7.45 ± 1.82 | 6.98 ± 2.69 | 0.84 |
| 5min | 8.72 ± 2.75 | 8.31 ± 4.46 | 0.18 |
| Mechanical Ventilation | 11 | 13 | 0.01 |
| Culture- proven sepsis | 18 | 8 | 0.02 |
| Formula feed | 19 | 7 | 0.01 |
| Thrombocytopenia | 16 | 15 | 0.01 |
| NEC stage III | 5 | 4 | 0.01 |
| Inotropic support | 3 | 16 | 0.03 |

Conservative treatment was employed in 49 (84.5%) neonates while 9 (15.5%) needed surgical intervention and the post-surgical expiry rate was 29%. The overall mortality rate was 32.7% i.e., out of a total of 58 neonates in the study population, 19 expired, 3 (5.2%) left against medical advice while 36(62.1%) were discharged.

## DISCUSSION

NEC has the tendency for sudden progression to disseminated intravascular coagulation, hypotension and multi-organ failure. Research data on the prognosis of NEC in developing countries is scarce, although a number of prognostic elements of NEC are adaptable and connected to survival in newborns and therefore, if addressed can help prevent this condition [11]. The prevalence of NEC in our

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study population was 7.1%. Temere *et al.*, in their study from Ethiopia have reported a similar prevalence rate of 9.7% while Mekonnen *et al.*, observed a much higher prevalence of 25.4% though, Rees *et al.*, have reported a much lower NEC prevalence rate of 1.8% in developed countries [10, 12, 13]. In our study the survival rate of preemies with NEC was high i.e. 72.4% whereas research findings of Satardien *et al.*, reveal a survival rate of 44.2% [14]. The reason for a lower mortality rate in our study is explained by early diagnosis of the condition and prompt availability of pediatric surgical facility. The findings of our study highlight NEC staging to be an important prognostic element for a good outcome in NEC. We found that low birth weight and NEC stage III are greatly related to mortality. In the present study, 69.7% of the neonates with NEC were less than 1500 grams and stage III were present in 9(15.5%). A number of research observed NEC and its mortality to be strongly related to low birth weight [4, 5]. This is so because low weight at birth is connected to a weak immune function and therefore, a greater chance of acquiring infection [6]. We observed the frequency of enteral feeding using breast milk was low in the study population i.e., 43%, this was due to the development of prematurity related complications. A number of studies have highlighted the role of exclusive human milk enteral feeding to be protective against NEC [4, 10]. Blood culture proven sepsis was present in 26 (44.8%) of our study population. *Klebsiella pneumoniae* was the predominant organism in 42.3 % of neonates with positive blood culture, followed by Acinetobacter species in 23.1 % while staphylococcus aureus was isolated in only 5.3%%. A previous local study has also reported infection with *Klebsiella* and other gram-negative organisms to be mainly responsible for causing NEC in preterm babies [15]. A study by Dong *et al.*, reported S. epidermidis to be the predominant organism causing sepsis in preterm newborns and it led to an approximately two-fold increase in the NEC prevalence [16]. We noted the prevalence of NEC to be higher in males as compared to females with a male to female ratio of (1.6:1). Our findings are similar to a research data from India, and another study from Karachi wherein all the neonates admitted with NEC were males [15, 17]. However, Siahaan *et al.*, observed a higher prevalence of NEC in females and 3.1-fold higher risk of mortality [18]. These differences in findings could be due to variable geographical and sociodemographic factors involved. In the present study thrombocytopenia was related to a high chance of death with NEC, being present in 78.9 % of expired neonates (p-value 0.01). A number of studies have reported thrombocytopenia to be clearly connected with an advanced stage of NEC as it signifies intestinal ischemia and has been documented as a clear prognostic factor in affected neonates [2, 7]. Similarly, in our study 94 % of preterm babies with NEC stage III had a decreased platelet count. In concert with findings of other studies [19, 20], we found apnea, use of mechanical ventilation and decreased blood pressure requiring inotropic medication to be an important prognostic determinant of mortality. We noted that in neonates who expired, 44% had apnea and 84.2% had hypotension requiring inotropic support. The rate of invasive ventilation was higher i.e., 68.4% in neonates who expired. This might be due to an advanced stage of NEC being present in these neonates. A number of studies have reported conservative treatment to yield a higher survival rate than surgical intervention in preemies with NEC [21, 22]. Similarly, in our study, 84.5% neonates were treated conservatively while laparotomy was performed in 15.5% of the study population and the post-surgical expiry rate was only 29%. Thyoka *et al.*, and Kastenberg *et al.*, have reported a mortality rate as high as 50% after surgical treatment [2, 23].

## CONCLUSIONS

In our study, high prevalence of NEC in preemies (7.1%) and death rate of 32.7% was recorded. Low birthweight, sepsis formula feeding and thrombocytopenia were linked to mortality. It is necessary to address risk factors associated with NEC and positively affect long term outcome in preterm babies.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Oral Health Status of Elementary School Aged Children in Rawalpindi, Islamabad, Pakistan

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## ABSTRACT

Dental caries among Pakistani's school children continue to increase. To identify treatment needs, current epidemiologic data are needed. Such statistics are currently not available for elementary school children. **Objectives:** To determine the oral status of school children using Decayed, Missed, Filled, Teeth index. To identify treatment need by using Community Periodontal Index of Treatment Needs index. **Methods:** An analytical cross-sectional study was performed on 385 elementary school children aged between 13 to 17 years. A simple random sampling method was performed. The participants were both from government and private schools of Rawalpindi, Islamabad, Pakistan. Data were collected by modified WHO questionnaire. Oral examinations were performed in accordance to WHO guidelines. After taking permission from school, informed consent from parents, and assent from students, oral examinations were done by undergraduate and DMFT and CPITN index were assessed. **Results:** Mean DMFT and CPITN score among school children came 1.17±2.182 and 1.04±0.910 respectively. More than a one-third of the elementary school students needed high level dental care. **Conclusions:** Oral health status of elementary school aged children is relatively unsatisfactory. There is a need to introduce dental camps and oral hygiene awareness programs in educational settings.

## INTRODUCTION

Pakistan is 5th most populous country of world [1]. There are 23 major cities having population of 2 million or above. The rural areas have 400 villages with population of about six thousand or above. There are about 37 million school aged children (5-16years old) out of which total 25 million are enrolled in schools [2]. Oral health is reflection of general wellbeing of human beings. WHO define oral health as Oral health is a key indicator of overall health, well-being and quality of life. It encompasses a range of diseases and conditions that include dental caries, periodontal (gum) disease, tooth loss, oral cancer, oro-dental trauma, noma and birth defects such as cleft lip and palate [3]. The seriousness of disease rates that dental diseases influence 3.5 billion people in the world and more than 530 million children experience from caries of primary teeth and 2 billion people hurt from caries of permanent teeth [3].Pakistan is a developing country and burden of oral disease among students is highest, 56% of male students

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and 44% of their female are attending schools in Pakistan [4]. The burden of dental caries among primary teeth of elementary class aged children in Pakistan was reported as 44.7% [5]. Dental caries has not been removed in children although it has been preferred under consideration in some countries. More than 60-90 % of elementary aged children have dental caries in modernized countries [6]. The WHO Path Finder Survey in 2003 revealed that the burden of oral disease is low in the country but the adversity of the disease keeps on accelerating [2]. The DMFT score of 12-year-olds children increases from 1.59 to 2.26 within 3 years. An alarming finding of all previous surveys has been that above 90% of all teeth affected by caries are untreated. Only 28% of 12-year-olds in Pakistan had satisfactory oral health but 21% of these children required emergency scaling. This proportion will increase to 29% in 3 years [7]. Schools provide a good atmosphere for the student, by giving oral awareness programs [8]. And oral health education must be an important part of schooling academic syllabus. We have selected knowledge, attitude and behavior for oral hygiene practices and CPITN and DMFT index for oral health status, that was part of Khan, et, al 2004 research [7]. Despite the public health problems there has been little epidemiologic research in the data of oral health in elementary school aged adults of Pakistan.

## METHODS

This Analytical cross-sectional study was conducted in both government and private schools of Rawalpindi, Islamabad region, Pakistan. The government and private schools were point out and required sample was fulfilled by simple random sampling. Sample size determination was done with WHO calculator since no data is available, we took prevalence as 50%. The Final sample size was 385. All participants of the study were given detailed study information, aims, objectives, and explanations and all were asked to sign informed consent before start of study. Inclusion Criteria includes participants of elementary classes having permanent dentition completed with no deciduous tooth present and who gave informed consent. Exclusion Criteria include participants with previous history of, trauma, tooth loss due to trauma, family dental history, psychological history, and previous orthodontics treatment. The study was reviewed by Ethical Committee of CMH Rawalpindi, Pakistan and granted ethical clearance. Also, permissions were taken from students, parents and school administration. For data collection tool a modified WHO questionnaire was used for assessing the knowledge attitude, behaviors of participants. The questionnaire consists of 17 variables, 2 were related to attitude of participants, tooth cleaning is a part of general body cleanliness, is it easy for you to clean your tooth before going to bed. 8 were related to Knowledge, number of milk and permanent teeth, age 1st molar erupts, most important mineral in tooth paste, cause and 1st sign of gum diseases, cause and prevent measures of tooth decay, time for brushing. Last 7 variables were related to behavior, time and frequency of brushing, use of toothbrush and toothpaste during brushing, use of saunsapari, meetha pan, use of tobacco(smoking), dental visits every 6 months, use of toothpick or dental floss, pattern of tooth brushing that was evaluated by direct examination. Study participants were interviewed, variables were assessed as, point 1 for correct answer, and 0 for wrong. Variables marks were added for individual group. CPITN or Community Periodontal Index for Treatment Needs measuring the presence or absence of gingival bleeding on probing, supra or subgingival calculus and periodontal pockets by using a 0.5 mm ball tip WHO probe. CPITN may be used as a general indicator of bleeding and pocket depth [9]. CPITN index were marked (0 for Healthy, 1 for Bleeding Gums, 2 for Calculus, and 3 for Pocketing). DMFT is the sum of the number of decayed, missing due to caries, and filled teeth in the permanent teeth. DMFT index, values were distributed as, score 0 means healthy or no caries, score 1 explain mild caries and DMFT values 1 to 7, score 2 moderate caries experience and DMFT value 8 to 14, score 3 severe caries and DMFT value 15 to 21 and score 4 very severe caries level of respondents and DMFT value 22 to 28. For data collection procedure a modified questionnaire was used and trained dentists interviewed the participants and their responses were reported and entered in SPSS. For oral examination fresh dentist were trained to record findings on oral examination. WHO probe community Periodontal Index probe and Instruments were used for periodontal status that were double sterilized before and after procedure, oral examination was done under daylight and visual tactile sensation and patient was seated on school chair. A pilot study was conducted earlier on 30 participants to check validity and reliability of questionnaire. Kappa statistics was used and found to be 0.84. For statistical analysis SPSS version 22.0 was used descriptive analysis was done, Mean and Percentage were calculated DMFT values of 0.0-1.1 is very low, 1.2-2.6 low, 2.7-4.4 moderate, 4.5-6.5 high, >6.6 very high.

## RESULTS

All the 385 participants successfully completed the questionnaires. This study included 385 participants out of which 49.1% were Male and 50.9% were female. Gender distribution can be seen in Table 1.

**Table 1:** Gender distribution of respondents

| Variables | Percentage |
|---|---|
| Male | 49.1% |

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| | |
|---|---|
| Female | 50.9% |
| Total | 100% |

Figure 1 explains, 1st group of 13 years of age had 154 (40%) respondents, 2nd group of 14 years of age had 166 (43.1%) respondents. 3rd group was of 15 years of age had 50 (13%) participants, 4th group was of 16 years of age had 9 (2.3%) and last was 17 years of age had 6 (1.6%) of respondents.

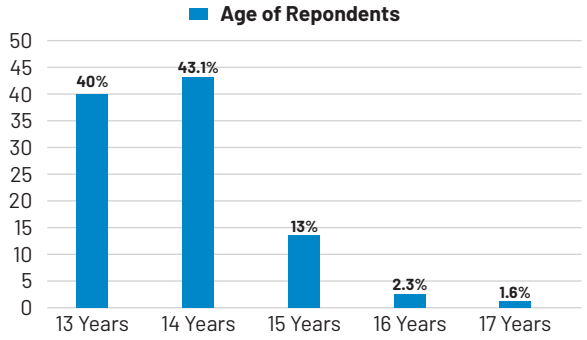


**Figure 1:** Age distribution of respondents

Out of total 168 individuals (43.6%) were from class 7th, and 217 (56.4%) participants were from class 8th. For attitude two variables and cumulative score 0 indicated poor attitude, score 1 satisfactory attitude, score 2 good attitudes. None of them had poor attitude, 17 (4.4%) had satisfactory attitude and maximum students 368 (95.6%) had good attitude. Similar pattern was adopted for knowledge and oral health behavior with 8 variables each score 0 indicated very poor, score 1 poor, score 2 below satisfactory, score 3 satisfactory, and score 4 above satisfactory, score 5 and 6 good and score 7 and 8 indicated very good knowledge, none of them had very poor knowledge, 53 (13.8%) had poor knowledge, 44 (11.4%) had below satisfactory knowledge, 61 (15.8%) had satisfactory knowledge, 59 (15.3%) had above satisfactory knowledge, 124 (32.2%) had good knowledge, and 44( 11.4%) had very good knowledge. Similarly for oral health behavior, 12 (3.1%) had below satisfactory behavior, 59(15.3%) had satisfactory behavior, 168 (43.6%) had above satisfactory behavior, 138(35.9%) had good behavior and 8 (2.1%) had very good behavior. CPITN and DMFT index was used for evaluation of oral health status.Table 2 explains results as, 128 (33.2%) were Healthy, 147 (38.2%) had Bleeding Gums, 82 (21.3%) had Calculus, 28 (7.3%) had Pocketing, more than half of the students had poor oral health status.

**Table 2:** CPITN Index for respondents

| Code | CPITN index | Frequency (%) |
|---|---|---|
| 0 | Healthy | 128 (33.2%) |
| 1 | Bleeding Gums | 147 (38.2%) |
| 2 | Calculus | 82 (21.3%) |
| 3 | Pocketing | 28 (7.3%) |
| | Total | 385 (100%) |

Table 3 explain results as 230 (59.7%) were healthy, 127 (33%) had score 1, 28 (7.3%) had score 2.

**Table 3:** DMFT index values of respondents

| Code | DMFT index score | Frequency (%) |
|---|---|---|
| 1 | Healthy | 230 (59.7%) |
| 2 | 1 to 7 | 127 (33%) |
| 3 | 8 to 14 | 28 (7.3%) |
| 4 | 15 to 21 | 0 (0%) |
| 5 | 22 to 28 | 0 (0%) |
| | Total | 385 (100%) |

Table 4 demonstrates, mean value for DMFT and CPITN index is 1.17±2.182 and 1.04±0.910 respectively. More than a one-third of the elementary school students needed high level dental care.

**Table 4:** Mean and standard deviation values for DMFT and CPITN indices

| Index | Frequency | Mean ± SD |
|---|---|---|
| DMFT index | 385 | 1.17±2.182 |
| CPITN Index | 385 | 1.04±0.910 |

## DISCUSSION

This study was conducted on 385 elementary class school going students of Rawalpindi/ Islamabad. The overall burden of oral disease in school children of was 40.3%. These results were in accordance to study conducted in 6 to 12 years old school students of Karachi, Pakistan where findings of tooth decay were found to be more than a 1/3rd of sample but they were unable to determine oral health status of age between 13-17years [10]. Our study was not in accordance to a study carried out in 15 cities of Pakistan by Abdul Aleem to determine the 12 years old oral status where DMFT score was found to be 0.9 [11]. A similar study was carried out in India and Pakistan with to evaluate the oral health status between age 12-15 years school children of India and Pakistan, our results were also in accordance to this study where Pakistani Mean DMFT was found to be 1±1.57 [12]. But no clear data for oral health status of 13-17 years of age in Pakistan region was available. The high burden of caries index in this age is because of high intake of sugary product because 79.9% had no knowledge about positive association between them. Similar research was conducted to observe the positive relationship between sugar consumption and tooth decay and a high association was found between them [13]. A study carried in Addis Adaba also proved that A high rate of caries was discovered in students of high sweets intake [14]. Our results were also in accordance to a study carried out in India where mean DMFT score was found to be 1.34±1.832 for age group 14-15 years of age [15]. Our results were also in accordance to a research carried out in China to evaluate burden of oral diseases of same aged children where prevalence was found to be 41.15% [16]. Lack of oral health education, awareness program, dentist checkup every 6 months can

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be a main problem. Our results were not in accordance to a study carried out in Germany to evaluate oral health behaviors where 80.3% have dental checkups every 6 months but in our study only 9.1% visits every 6 months. The same study proved that 77.7% respondents had knowledge about proper brushing technique but in our study only 85.5% had no knowledge about that [17]. Our results were not in accordance to a similar study which was conducted in Nigeria to evaluate the impact of oral hygiene practices on in-school oral health-related quality of life where 60.3% clean their teeth twice but in our case only 12.5% clean their teeth twice [18]. Our results were not in accordance to a study carried out in Saudi Arabia where 33.1% use dental floss when something stuck in their teeth but in our case 1% use dental floss [19]. High CPITN index might be due to poor oral hygiene and practices, less dental services, lack of oral health knowledge. Since school children are at risk for dental illnesses, including dental caries and gingival disease, oral health education and promotion is seen as a priority [20]. Our results were not related to a study carried out in Palestine where DMFT score at age 16 was found to be 1.7 [21]. Intensive Dental health education programs must be introduced in school for good oral hygiene [22]. Our results were also in accordance to a study carried out in Uganda where poor oral hygiene and high plaque prevalence in school children was related to lack of oral hygiene practices [23]. Our results were also related to research carried out in Portugal where 52.9% prevalence was seen in school children [24]. Our results were also in accordance to a research carried out in suburban Nigeria where oral health status of school children ages 13-16 years was poor and report poor school performance [25]. More than 1/3$^{rd}$ of elementary school aged children required emergency level of dental treatment.

## CONCLUSIONS

The study population was young school children but they had good attitude towards cleaning tooth and oral hygiene. But unsatisfactory knowledge and behavior concerning periodontal health among young Pakistani school students living in Rawalpindi/ Islamabad are in need of improvement. Poor dental caries, gingival health, and oral hygiene status among research participants may be a result of their lack of oral health knowledge. It is advised to implement proper and efficient health education to stop issues at the primary level. The inclusion of dental health education in the school curriculum should be mandated.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Parent-Child Relationship, Demographic Attributes and Self-Defeating Behaviour Patterns among Individuals with Substance Use Disorder

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## ABSTRACT

The human needs belong to the universal, fundamental, and influential needs and its effects on mental health if people get social rejection and exclusion. The maladaptive patterns were developed, and it could continue till adulthood. **Objective:** To look at the relationship and prediction of Parent-Child and self-defeating behaviour in individuals with substance use disorder. **Methods:** It was correlational research in which purposive sampling was used to collect data of 150 participants with substance use disorder from Hospital and Rehabilitation Centres. Pearson product moment correlation analysis, linear regression analysis was used to find correlation and predication respectively, while 5% (0.05). p-value was used for the study to analysis significance of the variables. The inventory of parents and peer attachment, and Ottawa self-injury inventory were individually administered to measure parent-child relationship, and self-defeating behaviour respectively. **Results:** Parent-child relationship was negative significant with Self-defeating behaviour ($r=-0.182$, $p\leq.05$), family member ($r= -0.33$, $p\leq0.005$) and with life satisfaction ($r= -0.27$, $p\leq0.001$), while self-defeating behaviour was positively significant with age ($r= 0.29$, $p\leq0.005$), family status ($r=0.19$, $p\leq0.05$) and duration with drug use ($r= 0.17$, $p\leq0.05$). Negatively significant with education ($r= -0.19$, $p\leq0.05$), marital status ($r= -0.28$, $p\leq0.005$) and life satisfaction ($r= -0.27$, $p \leq0.005$). The result showed that 11% of the variance explained by demographic variable in self-defeating behaviour of participants. **Conclusions:** It was concluded that negative relationship found between parent-child relationship and self-defeating behaviour. Parent-Child relationship is significant predictor of self-defeating behaviour with demographic variables.

## INTRODUCTION

The human needs belong to the universal, fundamental, and influential needs and its effects on mental health if people get social rejection and exclusion [1]. The maladaptive patterns were developed or related to the early experiences relation with parents and other people (peer), and it could continue till adulthood [2]. Self-defeating behaviour was noticeable issue in clinical and social setting and explained as self-imposing like purposefully do injuries and harming [3]. Self-defeating self-destructive conduct, maladaptive behaviour, and/or risk-behaviours are terms used to describe a range of activities that commonly produce bad outcomes and pose a harm to an individual's physical and mental well-being [4-8]. People involved into self-defeating pattern due to getting rejection and inconsistent in their relationship with parents and their parents fail to provide love and attention about their needs [9]. The parent-child relationship is a unique procedure for feelings, behaviours, and expectation. During the course of the lifespan, the people have many relationships, but the parent-child relationship is special. To apprehend the parent-child relationship gives the impression of certain aspects like physically, emotionally, and socially [10]. There are distinct kinds of relationships that can be put into caregiver in separate categories i.e., secure relationship (child dependent on their parents about their needs, beliefs and want their parents in every situation), avoidance

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relationship (parents' response to the child wishes), ambivalent relationship (child feel insecure connection with their parents) and disorganized relationship (give a secure environment for child). The way a child (adult) is connected to their parents shows how they will behave around others when their parents are not near to them [11-13]. Substance use is usually defined as a pattern to altering mood and for harm to self. In "Substance" many different forms are including like alcohol and other drugs which are legal or illegal and some substances are not drugs at all [14]. Substance use is defined as a psychoactive substance which uses a harmful and dangerous product such as alcohol and illicit drugs. According to DSM-5 substance-related disorder is recognized as in 10 classes of drugs [15]. Alcohol, cannabis, inhalants, hallucinogens (phencyclidine and other hallucinogens, such as LSD), opioids, hypnotics, sedatives, stimulants (including amphetamine-type drugs, cocaine, and other stimulants), cigarettes, and other unidentified chemicals have all been used [16]. The previous research looked at the link between parent-daughter relationships, psychological functioning, and self-defeating Behaviour in female adolescents. The findings revealed that the parent-daughter relationship was indirectly linked to self-defeating behaviours (i.e., deliberate self-harm/suicidal ideation, multiple sexual partners, and substance abuse) and that psychological factors played a role as a mediator between these variables (parent-daughter and self-defeating behaviour) (*i.e.,* low self-esteem and internalising symptoms) [17]. Furthermore, a previous study conducted at Midwestern University to test the conceptual model of working through self-defeating style to investigate the various concepts of delf-defeating behaviour patterns revealed that attachment and distress were mediators between self-defeating behaviour patterns and depression, as well as some other variables such as self-esteem, social self-efficacy. The current study was designed to investigate the relationship between parent-child, self-defeating behaviour patterns and its demographic correlation in clinical population (substance use patients), and find out the prediction between parent-child relationship and self-defeating behaviour in clinical population (substance use disorder).

## METHODS

It was correlational research in which purposive sampling was used in this study. Pearson product moment correlation analysis, linear regression analysis was used to find correlation and predication respectively, while 5% (0.05) p-value is used for the study to analysis significance of the variables. The sample size was 150 participants determined through G-power analysis. The sample was collected from different Hospitals and Clinic of Lahore. The including Punjab Institute of Mental Health (PIMH) (n= 16), Services Hospital (n=2), Willing Ways Clinic (n=10), Blessing the Mental Health Clinic (n=27), Fountain House (n=17), Inspire Recovery Clinic (n=19), Mayo Hospital (n=49), Ehsaas Clinic (n=6), and Jinnah Hospital (n=4). After the permission from the authorities of respective hospitals and clinic, data was collected from outdoor and indoor patients. The demographic information sheet included the information related to the individual with substance abuse and its divided into general information such as age, education, number of siblings, birth order, marital status, number of children, occupational, number of family member, family income, Participant income, satisfied with life and other related to the information about drugs or substance use such as type of drug, duration of drug use, amount of drugs use, reason to use drug, feeling while using drugs, etc. The Inventory of Parent and Peer Attachment (IPPA) is a self-report measure of parent-adolescent relationship quality, and it has twenty-eight items of both mother and father [18]. The ratings were computed on three subscales for each relationship (mother and father) such as trust, communication and alienation. There is reverse scoring of trust and communication items i.e., 3, 5, 7, 10, 15. The 5-Likert scale is used *i.e.,* 1= almost always/always true till 5= almost never/never true). The Ottawa self-injury instrument scale, established by Cloutier *et al.*, is a self-report inventory [19] that looks at self-harm in terms of occurrence, frequency, self-harming functions, and dependence on a psychoactive substance. The solution was determined by selecting from a range of possibilities ranging from 0 to 4 (daily or always). The self-injury function subscale has 31 items, whereas the reliance on psychoactive substance subscale has seven. After taken permission from the author the scale was translated into the Urdu language using MAPI guidelines. The scale was translated into Urdu using MAPI criteria, which are an internationally established translation approach. To convert the original instrument into the target language, the linguistic validation procedure was used. The scale was translated into a format that was conceptually equivalent to the original and easily understood by those who received the translated questionnaire. The scale was translated in both directions, forward and backward. Data were entered and analysed by SPSS version-25.0. Pearson product moment correlation analysis between was carried out among study variables and demographic characteristic of participants. p-value <0.05 was considered as significant.

## RESULTS

Present research was carried out to find out the relationship between parent-child, self-defeating

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behaviour patterns and its demographic correlation in Clinical Population (substance use patients). The first finding revealed the psychometric qualities of the evaluation tools employed in this study i.e. The questionnaire's Cronbach's Alpha coefficient. The demographics of the participants were reported in the second. Finally, Pearson Product correlation studies were provided, which looked at the relationship between parent-child, self-defeating behaviour patterns, and demographic correlation in the clinical population (substance use patients). In the last, regression analysis was presented that show predictors of demographic variables. The results shown in Table 1 indicate that the Cronbach's alpha reliability of the parent and peer inventory, and Ottawa self-injury inventory (self-defeating behaviour) is high, while the internal reliabilities of all subscales are acceptable.

**Table 1:** Cronbach's alpha reliability of the Parent, Peer Inventory, and Ottawa Self-Injury Inventory

| Variables | k | Mean ± SD | Potential | | Actual | | α |
|---|---|---|---|---|---|---|---|
| | | | Min Scores | Max Scores | Min Scores | Max Scores | |
| Parent and Peer Attachment | 50 | 167.4 ± 18.7 | 1 | 5 | 50 | 250 | 0.79 |
| Attachment with Mother | 25 | 84.9 ± 9.9 | 1 | 5 | 25 | 125 | 0.67 |
| Attachment with Father | 25 | 82.4 ± 10.8 | 1 | 5 | 25 | 125 | 0.66 |
| Self-Injury | 67 | 191.8 ± 34 | 0 | 4 | 0 | 268 | 0.79 |
| Functions | 25 | 40.9 ± 20.2 | 0 | 4 | 0 | 100 | 0.92 |
| Addictive | 7 | 13.16 ± 6.1 | 0 | 4 | 0 | 28 | 0.78 |

k= Number of Items, M= Mean, SD= Standard Deviation, α= Cronbach's alpha

Table 2 revealed that the demographics of the participants. The mean ± standard deviation age of participants was 28.4 ±7.2 and mean ± standard deviation of Education was 8.2 ± 4.4). The duration of drugs use by participants was 6.1 ± 4.3 with the number of drugs 4.4 gram ± 12.2. Mostly participants were unmarried (90%) and lived in the nuclear family system (101%). Mostly participants requested help from their family members (82%) and Satisfied from their life (71%).

**Table 2:** Showing Demographic Characteristics of Participants (N=150)

| Variables | Mean ± SD, F(%) |
|---|---|
| Age (15-55) | 28.4 ± 7.2 |
| Level of Education (0-14) | 8.2 ± 4.4 |
| Duration of Drug uses (1-20) | 6.1 ± 4.3 |
| Amount of drugs use (1-20gm) | 4.4 ± 12.2 |
| **Family System** | |
| Nuclear | 101(67.3) |
| Joint | 49(32.7) |
| **Marital Status** | |
| Married | 60(40.0) |
| Unmarried | 90(60.0) |
| **Drug use by other Family Member** | |
| Yes | 39(26.0) |
| No | 111(74.0) |
| **Attempt to Withdraw Drugs** | |
| Yes | 109(72.7) |
| No | 41(27.3) |
| **Success in Attempt Withdraw** | |
| Greatly | 83(55.3) |
| Not at all | 67(44.7) |
| **Life Satisfaction** | |
| Not satisfied | 26(17.3) |
| Satisfied | 71(47.3) |
| Too much satisfied | 53(35.3) |

The results in Table 3 reveal that the Parent's Cronbach's alpha reliability of the Parent and Peer Inventory α= 0.79 and Ottawa self-injury inventory (self-defeating behaviour) α= 0.79, while the reliability of subscale of The Inventory of parent-peer attachment is moderate attachment with mother α=0.67 and attachment with father α=0 .66. Pearson product moment correlation was used to discover the relationships between study variables. Other study factors and subscales were also investigated for correlation.

**Table 3:** Pearson product moment correlation analysis between study variables and demographic characteristic of participants (N=150)

| Parameters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Mean ± SD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCR | 1 | -.18* | -.14 | .05 | .04 | .01 | -.32** | -.00 | -.09 | .38** | 167.40 ± 18.78 |
| DSB | | 1 | .28** | -.19* | .18* | -.27** | .11 | .16* | .11 | -.27** | 191.87 ± 34.04 |
| Age | | | 1 | -.21** | .15 | -.55** | -.06 | .27** | .07 | .00 | 28.45 ± 34.04 |
| Ed | | | | 1 | .00 | .21** | -.08 | -.20* | .12 | .06 | 8.15 ± 4.41 |
| Fs | | | | | 1 | -.27** | .02 | .15 | .05 | -.03 | 1.33 ± 0.471 |
| Ms | | | | | | 1 | .14 | -.16* | -.04 | -.04 | 1.60 ± 0. 492 |
| Rfh | | | | | | | 1 | -.04 | -.04 | -.27** | 1.45 ± 0.499 |
| Ddu | | | | | | | | 1 | .09 | .04 | 6.06 ± 4.30 |
| Adu | | | | | | | | | 1 | .011 | 4.44 ± 12.12 |
| LS | | | | | | | | | | | 2.18 ± 0.705 |

p<0.05*, p<0.005**, p<0.001*** PCR= Parent-Child Relationship, SDB= Self-Defeating Behaviour, age, ED= Education, Fs=Family System (1= Nuclear, 2= joint), Ms= Martial status (1= married, 2 unmarried), Rfh = Request for help (1= family member, 2= friends), Ddu= Duration of Drug use, Adu = Amount of drug use, LS= Life Satisfaction (1= not satisfied, 2= satisfied, 3= to much satisfied)

Results revealed that parent-child relationship had negative significant with self-defeating behaviour (r= -0.182, p ≤0.05), parent-child relationship negative significant with request for help toward family member (r= -0.33, p ≤0.005) and parent-child relationship had negatively significant with life satisfaction (r= -0.27, p ≤0.001), while self-defeating behaviour positively significant with age (r= 0.29, p ≤0.005), family status

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(r=0.19, p ≤0.05) and duration with drug use (r= 0.17, p ≤0.05), and negatively significant with education (r= -0.19, p ≤0.05), marital status (r= -0.28, p ≤0.005) and life satisfaction (r= -0.27, p≤0.005). Table 4 reveals the results of regression analysis; the first model shows the predicating self-defeating behaviour by parent-child relationship. The result indicated that self-defeating behaviour was significantly predicted parent-child relationship, F (1, 150) = 0.3, p ≤ 0.05 and $R^2$ = 0.03. The results show 3% of the variance predicator of self-defeating behaviour with parent-child relationship. The second model shows the predication of self-defeating behaviour by parent-child relationship and demographic variable. The result indicated that self-defeating behaviour was significant predictor of parent-child relationship and marital status, F(1, 150)= 0.8 p ≤ .001 and $R^2$ = 0.11. The result shows that 11% of the variance explained by demographic variable in Self-defeating behaviour of participant. The third model shows the prediction self-defeating behaviour by parent-child relationship and demographic variable. The result indicated that self-defeating behaviour was significant predictor of parent-child relationship by marital status and life satisfaction, F (1, 105) = 0.5, p ≥ 0.001 and $R^2$ = 0.16. The result shows that 16% of the variance predicator of self-defeating behaviour with parent-child relationship, marital status and life satisfaction.

**Table 4:** Hierarchical multiple regression analysis showing predication of self-defeating behaviour by parent-child relationship and demographic variables

| Predictors | Self-Defeating Behavior | |
|---|---|---|
| | $\Delta R^2$ | β |
| Model/Step 1 | 0.03* | |
| PCR | | -0.33* |
| Model/Step 2 | .08*** | |
| PCR | | -0.33* |
| Marital Status | | -18.9*** |
| Model/Step 3 | .055 | |
| PCR | | -0.15 |
| Marital Status | | -19.7*** |
| Life Satisfaction | | -12.3 |
| $R^2$ | 16% | |
| N | 150 | |

p≤0.05*, p ≤0.005**, p≤ 0.001*** B = Unstandardized Coefficient; $\Delta R^2$= Change R Square, $R^2$= R Square, B=Beta

## DISCUSSION

The current study has focused on the relationship of parent-child relationship and self-defeating behaviour patterns and how these factors affect self-defeating behaviour patterns in substance users in the Pakistani community. The findings of current study have been discussed in light of previous literature. Result of the present study also found that parent-child Relationship has negative relationship with self-defeating behaviour i.e., substance users engage in self-defeating behaviour when they get insecure attachment, rejection and abandonments from their parents. A previous study supported the present study result and literature finding which showed that psychiatric patients (Personality Disorder and Bipolar II Disorder) showed repetitively self-destructive behaviour which was affected by the parents separation and neglect [20]. Another study of Wei and Ku also supported the findings; research suggested that parent-child relationship linked negatively with Self-defeating Behaviour because of insure attachment style and psychological distress [21]. Similarly, another study finding also support the present result as self-defeating behaviour (deliberate self-harm/suicide behaviours) influenced to the parent-child relationship or conflicts in family increased the internal symptoms as psychological factors and maladaptive behaviour [17]. The individual had insecure and rejecting relationship with their parents that cause maladaptive behaviours (self-defeating behaviour). The present study finding showed that there was a correlation of parent-child relationship (Independent variable), self-defeating behaviour (dependent variable) with demographic characteristics of participants. Parent-child relationship has significant negative correlation with request for help and positive correlate with life satisfaction. The self-defeating behaviour has significant positively correlated with age, family system, duration of drug use, and satisfied with life and negatively significant with education and marital status. The current study also explored the certain demographic variable play role to show relationship with parent-child relationship, and self-defeating in the Individual with substance use disorder was life satisfaction. The present study finding showed that life satisfaction negatively correlation with self-defeating Behaviour, Rooks-Ellis *et al.*, also support the hypothesis and finding showed that life satisfaction negatively correlation with substance use [22].

## CONCLUSIONS

It was found that parent-child relationship was negatively significant correlate with self-defeating behaviour which means that substance users engaged in self-defeating behaviour due to getting insecure attachment, rejection and abandonment in their relationship. It was found that marital status and life satisfaction predicting the relationship of parent-child relationship, and self-defeating behaviour.

### Conflicts of Interest

The author declares no conflict of interest.

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**Original Article**

# Perspective of Patients & Health Care Providers Regarding Responsiveness at Fatima Jinnah Chest hospital, Quetta. A Qualitative Study

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## ABSTRACT

Tuberculosis is highly contagious with an estimated global incidence of 10 million in 2018. Pakistan has the world's 5th highest Tuberculosis burden. Achieving adequate responsiveness remains an elusive challenge for Pakistan's health system. Many factors regarding eight dimensions of the health system responsiveness are leading to a huge number of missing cases, loss to follow up and treatment failure and thus burden of the disease is increasing significantly. **Objectives:** To explore the perspective of health care providers and patients regarding the responsiveness. **Methods:** A qualitative study was conducted in Fatima Jinnah Chest Hospital, Quetta from February 2021 to July 2021. Two Focus Group Discussions comprising of 8-12 Health Care Providers of Fatima Jinnah Chest Hospital were conducted. Non- Probability purposive sampling was employed. Thematic Analysis was done. **Results:** Advance technology, communication barrier, basic facilities, and patient overflow were four overlapping themes that emerged from focus group discussion of health care providers. **Conclusions:** Overall results and findings indicate that there is a need for investment in both material and structured improvements at Fatima Jinnah Chest Hospital and improvement of services at primary level to reduce burden at tertiary care hospital like Fatima Jinnah.

## INTRODUCTION

Tuberculosis is a highly contagious and potentially fatal disease; the infection is transmitted by its causative organism Mycobacterium Tuberculosis [1].Tuberculosis had an estimated global incidence of 10 million people in 2018, despite it being highly preventable and curable, the highest number of newly diagnosed Tuberculosis cases occurred in the South-East Asian region, with 44% of newly diagnosed cases, followed by the African-region, with 24% of newly diagnosed cases and the Western-Pacific with 18% [2]. Thirty countries declared as high Tuberculosis burden countries accounted for 87% of newly diagnosed tuberculosis cases, while 8 countries including Pakistan accounted for two-thirds of the total cases, with India at top, followed by China, Indonesia, Philippines, Pakistan, Nigeria, Bangladesh and South Africa [3]. Pakistan thus has the world's 5th highest Tuberculosis burden with the

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annual incidence estimated at over 562,000 [4]. While the World Health Organization's Eastern-Mediterranean Region, comprising of 22 countries, account for 8% of the global burden, Pakistan is responsible for 75% of it [5]. However, 369,548 cases were notified and put on treatment in 2018, indicating that over a third of the patients did not report to the Tuberculosis control mechanisms in the country and went 'missing', National Tuberculosis incidence has therefore remained static over the last two decades since the National Tuberculosis Control Program was established and the disease declared a national emergency in 2001, as a significant proportion of cases is missed that spread the disease further [6]. A total of 1.5 million patients died due to tuberculosis in 2018' worldwide tuberculosis is one of the top 10 causes of death and the most prominent cause from a single infectious pathogen [7]. World Health Organization estimates that with a case fatality rate of around 8%, a total of 45,000 patients died from Tuberculosis in Pakistan during 2018 [8]. Multidrug-resistant TB (MDR-TB) also remains a public health crisis and a health security threat. World Health Organization also estimates that there are 484,000 new incident cases of MDR-TB globally, out of which Pakistan is contributing 28,000 annually, only 11% of which are diagnosed and put on treatment [9]. Sustainable Development Goal Target 3.Remain ending the global Tuberculosis epidemic by 2030. The End TB Strategy has set milestones (for 2020 and 2025) and targets (for 2030 and 2035) for a big decline in TB incidence and mortality ,The targets for 2030 are a 90% decrease in tuberculosis mortality and 80% decline in the tuberculosis incidence (new cases per 100k populations per anum) in comparison with the rates in 2015 [10]. On 26 September 2018, the United Nations General Assembly carried out its very first high-level meeting (HLM) for the struggle against TB, aimed at accelerating summit level efforts in ending TB and approaching all the tuberculosis affected people with prompt prevention and accurate care [11]. The National Tuberculosis Control Program, Pakistan annual 2018 data showed that a total of 36% (192,452) of the total Tuberculosis cases were neither diagnosed nor notified. The missing of over a third of cases in Pakistan is attributable to the fact that both the public and the private sector are neither associated nor mobilized with the process of identifying and placing on treatment, all the tuberculosis cases reporting to them. There is a huge gap of adequate system responsiveness in relation to Tuberculosis care in Pakistan and achieving adequate responsiveness has remained an elusive challenge for the country's health system. World-Health-Report 2000 has ranked Pakistan's health system at number 122 in terms of responsiveness indicating an urgent need for improvement [12]. This study was designed to evaluate the responsiveness of hospital's patient services in relation to their expectations, as well as factors impeding their responsiveness. It is believed that the study results will help the decision makers in identifying the critical areas and prioritize system's need to improve Health System Responsiveness

## METHODS

This qualitative study was performed from February to July 2021 investigating patients attending Fatima Jinnah Chest Hospital (FJCH), Quetta for Tuberculosis care. The study was conducted after taking ethical approval from institutional review board of Armed Forces Post Graduate Medical Institute. Approval was taken from the Medical Superintendent FJCH Quetta to carry out the research. Two Focus Group Discussions (FGD) comprising of 8-12 Health Care Providers (HCP) of Fatima Jinnah Chest Hospital were conducted. Purposive sampling was used for this study. Informed consent was taken from all participants and their privacy, anonymity, dignity was ensured. Qualitative data were analysed for HCPs with thematic analysis. Thematic analysis was an iterative process which started with reading and re-reading the quotes then coding the quotes. After reading and coding all the quotes inductively and independently by using participant's words. The codes were then clustered into minor themes, minor themes were then categorized into categories and ultimately into broader themes.

## RESULTS

Two focus group discussions were done with healthcare providers. There were 8 healthcare providers in first FGD and 11 healthcare providers in second FGD respectively. All health care providers belonged to Quetta. HCPs in FGDs were coded as below (Table 1).

| No. | Focus Group Discussion | Respondents |
|---|---|---|
| 1 | FGD-1 | R1, R2, R3, R4, R5, R6, R7, R8. |
| 2 | FGD-2 | R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19. |

**Table 1:** Coding scheme of focus group discussions

Themes emerged from the qualitative data of healthcare providers are advance technology, basic facilities, communication barrier and patients overflow.

**Theme 1: Advance Technology**

Focus group discussion led to emergence of a new theme, Advance Technology. All Healthcare providers believed advance technology should be used to increase the responsiveness of Fatima Jinnah Chest Hospital as given in Table 2.

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| Theme | Categories | Codes / Minor Themes | Quotes |
|---|---|---|---|
| Advance Technology | Digitalization of hospital | • Translator app<br>• Electronic appointment system<br>• Digitalization of patient medical records | "It will be easy for us to mitigate the patient's burden on OPD if our hospital administration starts electronic token for appointment |
| | Modern mechanization of hospital | • Advance diagnostic medical equipment's<br>• Tele-health services for remote areas | "Patients medical record should be digital for easy access and visiting of patients by family members should be shifted to social media apps to mitigate infection spread" |
| | Use of media for mass communication | • .Use of digital media for social support<br>• Use of technology for awareness of patients | FJCH is attended by patients with different diverse ethnicities where it is difficult to understand their language, for this purpose we should use translator app |

**Table 2:** Advance Technology

Quality of basic amenities domain was renamed as basic facilities in the thematic analysis. Majority of the participants expressed their dissatisfaction over the lack of basic facilities available at Fatima Jinnah Chest Hospital. Their perception was that due to lack of basic facilities, patients with infectious diseases become incompliant and are lost to follow up resulting in further spread of infection as given in Table 3.

| Theme | Categories | Codes / Minor Themes | Quotes |
|---|---|---|---|
| Basic Facilities | Infrastructural Deficiencies at Hospital | • Insufficient space at waiting area<br>• Unclean rest rooms<br>• No separate toilets for HCPs | "Patient's waiting area at FJCH is very congested and always overcrowded due to which few patients once diagnosed with TB rarely follow back causing ineffective treatment" |
| | Segregated space for women | • Separate rest area for women<br>• Segregated waiting space for women | "A female patient visiting me complains about gender disparity at hospital, she suggested that there should have been separate waiting area for females and mentioned that there are no separate rest areas for a female |
| | Role of patient amenities | • Availability of Patient friendly food<br>• Lost to follow up<br>• Incompliant patients<br>• Long travelling hours | "Hospital canteen should start patient friendly food according to their diseases" |

**Table 3:** Basic Facilities

### Theme 3 Communication Barrier

The healthcare provider's perceptions on communication skills of patients were both positive and negative but the majority pointed out the problem of language barrier when patients tend to explain their history in their local languages and few interpreters being available as given in Table 4.

| Theme | Categories | Codes / Minor Themes | Quotes |
|---|---|---|---|
| Communication Barrier | Use of Common language | • Language barrier<br>• Use of local languages<br>• Use of a translator | "My patient gave me his history in Pashto, and I did not understand a word, so I requested him to please talk in Urdu, ultimately I had to use a translator which took a lot of time" |
| | Medical Terminologies | • Awareness<br>• Use of medical terms<br>• Difficulty in understanding treatment | "We attend patients from very diverse ethnic groups who are illiterate, and it becomes very difficult to make them understand medical terms |
| | Patient Literacy | • Uneducated patients<br>• Second opinion<br>• Unsatisfaction of patients | "In my opinion it is nearly impossible to completely satisfy a patient's need either relating to health or not when both parties do not share a common language, common language is very important |

**Table 4:** Communication Barriers

### Theme 4 Patient's Overflow

Most of the healthcare providers were of the view that public hospitals in Quetta are overburdened and they receive patients from entire province and even from Afghanistan. Their perception was that they are overburdened with the patient's flow where basic facilities are near to nothing as given in Table 5.

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| Theme | Categories | Codes / Minor Themes | Quotes |
|---|---|---|---|
| Patients Overflow | Patient numbers | • High numbers of patients<br>• Uncooperative patients<br>• Lack of space in waiting room | "It is nearly impossible to maintain dignity and confidentiality or to communicate well with the patients when there are three doctors in a room all busy with examining patients and there is line of hundreds of patients waiting just outside the door" |
| | HCPs work burden. | • Work overload<br>• Long working hours<br>• Exhausting OPD | "In a single day a normal outpatient department crosses the number of 500 with no space for the patients to wait and hospital management would not do anything about it" |
| | Poor patient management. | • Unorganized management of patients<br>• Very low contact time with patient<br>• Compromised treatment quality | "Doctors at FJ hospitals are already overworked and stressed in this time of pandemic, it would be devastating if the hospital is not clean, well-lighted and comfortable |

**Table 5:** Patients Overflow

## DISCUSSION

The literature search that was carried out did not reveal any previous studies for evaluating health-system responsiveness in a tertiary-care hospital in Baluchistan province of Pakistan. The study participants were ethnically diverse with a mean age of 40.5 years. The overall responsiveness was 83.9%, while there was a slight contrast in responsiveness reported by males and females. This result is consistent with the results of a survey in Turkey in which females reported health-system responsiveness slightly lower than the males [13]. This difference could be related to the fact that public hospitals are overburdened with patients and minimal space for waiting area hence making it more difficult for females. A study conducted in Mashhad, Iran (compared health-system responsiveness with household's perception in two deprived regions) resulted that participants chose the "quality basic amenities" as the most important responsiveness domain and "social support" was selected as the least important domain of responsiveness [14]. This result is inconsistent with the findings of current study where participants chose "Prompt attention to care" as the important domain of responsiveness and "Patient's dignity" as the least important domain. This dissimilarity could be associated to the fact that Fatima Jinnah Chest Hospital is the only hospital in Baluchistan province of Pakistan, where patients travel from far-flung areas to get treated and mostly visited by patients from the low-income households. A similar cross-sectional survey with a sample size of 575 South Asians and 494 Chinese individuals conducted in Hong Kong showed that the Chinese reported generally lower health-systems responsiveness for outpatient and inpatient department services as compared with the South Asian participant's [15]. The findings of the current study are consistent with South Asian participants of this study. Both studies recommend collective efforts from HCPs and policymakers to improve the existing healthcare-system for patients. Dignity (79.5%) was the highest scored dimension of responsiveness followed by communication 73.2% and confidentiality scored lowest 62.1%. This finding is partially in line with existing literature where a descriptive cross-sectional research carried out in Tanzania showed that among the domains of responsiveness confidentiality scored (86.7%) being the highest scored domain followed by dignity (81.4%) [16].Confidentiality scored least among respondents of the current study, this finding is again similar with the existing literature, a research conducted among 6,113 adults in Germany (To determine total health-systems responsiveness and its relationship with the social determinants for ambulatory care from a patient's view) showed that a total of 90% of all patients who evaluated their last General Physician and Specialist visits were satisfied regarding communication, dignity, trust and autonomy. In contrast to this only half of patient's reported satisfaction for confidentiality in the doctor office. The study concluded that the ratings for confidentiality were distressing [17].Cross sectional study conducted in Iran on health-system responsiveness found responsiveness mean rating were 3.3 ± 0.6 and 3.8 ± 0.6 in a total of 5 for private and public hospitals, respectively [18]. The difference in highest and lowest mean scores of responsiveness were relevant to the choice of care and prompt-attention to health care. Findings of this study are again in line with current study where overall responsiveness have been selected as good, Prompt Attention was the most important domain in current study and dignity was the least important. Baluchistan is the biggest province of Pakistan which has a vast area and difficult to reach. In the current study prompt attention was chosen by the respondents as the most important dimension of responsiveness with a score of 43.6% that was comparatively higher than other dimensions of responsiveness indicating that the travel time to hospital and waiting time contributes to poor responsiveness. This is in line with existing literature where a study analyzed

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responsiveness of health systems from the community-dwelling adults aged 50 and over's perspective in Russia, Ghana, China, India and South Africa pointed to the fact that travel-time is a crucial contributor for poor responsiveness of health-system in all these countries [19].The results of this study also bore similarity to a study conducted with a sample size of 335 hospitalized patients in Kermanshah Iran on health-system responsiveness and reported that the overall responsiveness score was 72.6. The best rated domain of responsiveness was dignity with 82.2% and least rated domain was autonomy with 62.5, respectively. Socio-demographic variables of the respondents had no noticeable effect on the overall health-system responsiveness score [20].

## CONCLUSIONS

The study findings revealed that while responsiveness of FJCH reported by patients was 83.9% but HCPs have weak work-place trust coupled by a combination of below par working conditions and overflow of patients which are contributing to poor quality service creating an aura of negative patient-provider relations. Findings indicate that there is a need for investment in both material and structural improvements at FJ hospital and improvement of services at primary level to reduce burden at tertiary care hospitals like FJ.

### Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

# Prevalence and Impact of Cell Phone Elbow among Mobile Users in Different Cities of Punjab, Pakistan

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## ABSTRACT

Cell phone elbow is the pinching of ulnar nerve behind the elbow resulting in tingling or numbness within the hand when using a cell phone, sleeping with your elbows bent, or holding your arms bent and by your head for long period of time. **Objective:** To find out the prevalence of cellphone elbow among mobile phone users and its associated impairments and functional limitations. **Methods:** A cross-sectional study was conducted during October 2021 to April 2022. Data were collected from different Punjab colleges and universities: NUR International University, Riphah International University, The University of Lahore, University of Faisalabad, Niazi College of Physical Therapy and Fatima Memorial Hospital and College. Participants were recruited through convenience sampling from 17-50 years of age with positive Tinel sign test. Data collection were done by using the Numeric Pain Rating Scale and Boston Carpal Tunnel Syndrome Questionnaires. **Results:** Out of 250 subjects 33.2% were having noticeable symptoms associated with prolong phone usage. Among them 39.6% experienced numbness and tingling. Hand pain is reported in 32.8% and 27.6% experienced pain on ulna side of elbow. **Conclusions:** The prevalence of cell phone elbow was 33.2%, higher than the previous studies. This research advice the cell phone users to minimize their mobile usage, avoid prolonged calls, use hands alternately to avoid strain on one hand, use hands-free and ear pods while taking calls.

## INTRODUCTION

Cell phone elbow, is actually cubital tunnel syndrome that cause pain, burning, aching, and tingling like symptoms on the medial side of forearm and hand 5th finger and ulnar side of 4th finger [1]. Ulnar nerve entrapment occurs on the inner part of the elbow [2]. Usage of mobile handheld devices with forearm pronated and flexed elbow can decrease the motor conduction velocity of ulnar nerve more than other positions. The best position for elbow joint during using mobile handheld devices is 0°-45° elbow flexion with elbow supinated [3]. The time spent on mobile-phone has increased in the last decades leading to an increased time spent with flexed elbow [4]. Mobile phones are now heavily used on a daily basis, especially since they become more widely available and affordable worldwide [5]. Technology has the potential to change not only lifestyle culture but also posture and behaviour [6]. In order to conduct nerve conduction studies, a peripheral nerve must be stimulated while a recording from a muscle that the nerve innervates is being used [7]. The medial hand's sensory function is provided by the superficial branch, while the deep branch innervates the hypothenar, third and fourth lumbricals, interosseous, adductor pollicis, and

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deep head of the flexor pollicis brevis muscle [8, 9]. When pressure within the tunnel restricts the nerve, symptoms develop. Possible causes include arthritis, joint dislocation, fractures, and swelling of the tendon lining. Swelling in the tunnel can also occasionally result from fluid retention during pregnancy. By keeping the elbow bent for extended periods of time, symptoms deteriorate. Since the ulnar nerve is posterior to the elbow's axis of motion, it is stretched 4.5 to 8 mm during elbow flexion, and the cubital tunnel's cross-sectional area is reduced by up to 55% as intra-neural pressures rise up to 20 times during this motion. Two to three repeated and prolonged elbow flexion can irritate the ulnar nerve as a result, which can eventually result in cubital tunnel syndrome [10]. Patients who frequently use their cell phones for extended periods of time (also known as "cell phone elbow") have been found to have a link between prolonged elbow flexion and cubital tunnel syndrome. Long-term elbow flexion increases the risk of developing cubital tunnel syndrome and raising intra-neural pressure. Regular phone use causes these postural-induced symptoms, which are known as "mobile phone elbow"[11]. Patients who postpone seeing a doctor for the first time develop a chronic illness with hand weakness and complain of having trouble completing fine motor tasks, including trimming fingernails [12]. A motor impairment may show itself as a weak grasp (difficulty opening bottles or jars, for example), clumsy hands (difficulty typing), or problems with precision pinching skills (e.g., buttoning buttons). Patients with aberrant claw postures on their fourth and fifth fingers may find it difficult to hold objects in their hands [6]. The purpose of this research was to find out the prevalence of cell phone elbow among mobile phone users and to identify the impairments and functional limitations. As the usage of mobile phone is increasing at an alarming rate awareness related to it usage and impairments can be given to young population.

## METHODS

A cross sectional study was carried out to find out the prevalence of cellphone elbow among mobile phone users' young adults in Punjab, Pakistan. Duration of the study was seven months from August 2021 to February 2022. Data were collected from different colleges and universities of Punjab; NUR International University, Riphah International University, The University of Lahore, University of Faisalabad, Niazi College of Physical Therapy and Physical Therapy Department of Fatima Memorial Hospital and College. Sample size of 250 individuals calculated through Raosoft software. Participants were recruited through convenience sampling. People who are smart phones users both males and females ranging from 17-50 years of age suffering with history of excessive cell phone use (minimum 12-16 hours per day), elbow pain on dominant hand side, with positive Tinel sign test were included in this study. Patients having history of any surgery around elbow of dominant hand, trauma or neurological disorders of arm around elbow of dominant hand, non-electronic gadget users, systemic disorders like systemic lupus erythematous or rheumatoid arthritis, musculoskeletal disorders around elbow of dominant hand and psychological disorders were excluded from the study. Data collections were done by using the self-developed questionnaire for mobile usag, pain was assessed by using Numeric Pain Rating Scale (NPRS) and the functional status of dominant hand was evaluated by Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) [13, 14]. Participants were informed that their identity would not be disclosed, and an informed consent were taken. Data were analyzed using Statistical Package for Social Sciences (SPSS) version 25.0. Descriptive data were presented as frequency/ percentages whereas, quantitative variables in terms of mean & standard deviation.

## RESULTS

Table 1 shows characteristics of the study participants, 65.6% of the participants were females and 34.4% participants were males. 38.4% were of 18-30 age, 52% per of 31-40 age and 9.6% were of 41-50 age.

| Characteristics | | Frequency (%) |
|---|---|---|
| Gender | Male | 86(34.4) |
| | Female | 164(65.6) |
| Age | 18-30 | 96(38.4) |
| | 31-40 | 130(52) |
| | 41-50 | 24(9.6) |

**Table 1:** Characteristics of the study participants (n=250)

Table 2 shows about the data related to mobile phone usage. Regarding duration of phone use; 35.6% individuals use average 2 hours per day, 40.0% individuals use 4 hours, 13.6% individuals use 8 hours and only 4.0% individuals use 10 hours. While 4.8% of individuals use more than 10, hours per day. Data regarding duration of single call; 145 individuals (58%) attend average single call 5 min per day, 56 individuals (22.4%) attend 6-15min, 23 individuals (9.20%) attend 16-30min and only 14 individuals (5.6%) attend 31-45min. While 12 individuals (4.80%) attend more than more than 1 hour phone calls per day. 16.4% of the participants prefer to listen a phone call on loudspeaker and 83.6% participants did not. 44.8% of the participants prefer using Hands free and 55.2% participants did not.

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| Characteristics | | Frequency (%) |
|---|---|---|
| Average duration of phone usage per day | 2 hours | 89(35.6) |
| | 4 hours | 105(42) |
| | 8 hours | 34(13.6) |
| | 10 hours | 10(4) |
| | more than 10 | 12(4.8) |
| Average duration of a single phone call | 5min | 145(58) |
| | 6-15min | 56(22.4) |
| | 16-30min | 23(9.2) |
| | 31-45 min | 14(5.6) |
| | >1 hour | 12(4.8) |
| Prefer listening to call on loudspeaker | Yes | 41(16.4) |
| | No | 209(83.6) |
| Prefer using Hands free | Yes | 112(44.8) |
| | No | 138(55.2) |

**Table 2:** Descriptive statistics of mobile phone usage (n=250)

Figure 1 shows Pie chart of frequency and percentage for pain that individuals reported. 34.4% of participants rate 1 on the pain scale, 1.60% of participants rate 10 on the pain scale, 12.40% of participants rate 2 on the pain scale, 21.6% of participants rate 3 on the pain scale 9.6% of participants rate 4 on the pain scale 10.0% of participants rate 6 on the pain scale 5.60% of participants rate 7 on the pain scale 1.6% of participants rate 8 on the pain scale.

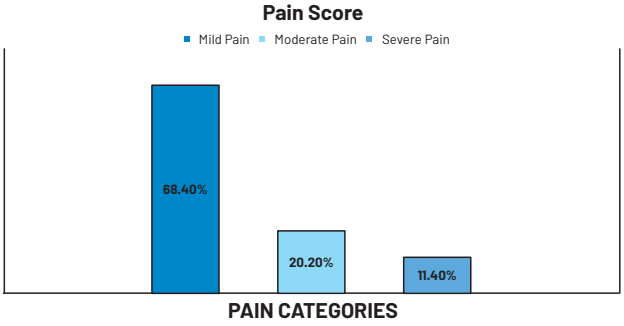


**Figure 1:** Numeric Pain Rate Scale percentage for Cell Phone Elbow

Table 3 shows impairment data that are present among participants. The participants report pain in hand 44.4% especially when it is bent, and 55.6% participants did not.27.6% of the participant has reported aching pain on the inside of the elbow and 72.4% participants did not. The participants reported numbness and tingling in the hand or ring and little finger 39.6% especially when the elbow is bent, and 60.4% participants did not. About 33.2% of the participants had symptoms and 66.8% participants had no symptoms, 30% of the participants reported weak grip and clumsiness due to muscle weakness in the affected arm and hand while 70% participants were not affected. Tingling, aching, burning or numbness was reported in 28% of the participants reported in the ulnar forearm present.

| Characteristics | | Frequency (%) |
|---|---|---|
| Pain in hand especially when it is Bent | Yes | 111(44.4) |
| | No | 139(55.6) |
| Aching pain on the inside of the elbow | Yes | 69(27.6) |
| | No | 181(72.4) |
| Numbness and tingling in the hand | Yes | 99(39.6) |
| | No | 151(60.4) |
| Symptom after prolong phone use | Yes | 83(33.2) |
| | No | 167(66.8) |
| Weak grip due to muscle weakness in the affected arm and hand | Yes | 75(30) |
| | No | 175(70) |
| Tingling, aching, burning or numbness in the ulnar forearm present | Yes | 70(28) |
| | No | 180(72) |

**Table 3:** Impairments of elbow, forearm and hand related cell phone elbow (n=250)

Table 4 shows results regarding functional status of the participants. The participants response for writing issue ranging from 'no difficulty' to 'cannot perform the activity at all due to hands and wrists symptoms (1-5). Out of the 250 participants, 170 reported 'no difficulty' in writing task. The participants response for holding a book while reading ranging from 'no difficulty' to 'cannot perform the activity at all due to hands and wrists symptoms' (1-5). Out of the 250 participants, 65.6% reported 'no difficulty'. 27.2% reported little difficulty, 4.0% reported, Moderate difficulty, 1.6% reported Intense difficulty, 1.6%reported that they cannot perform activities. The participants response for Buttoning of clothes ranging from 'no difficulty' to 'cannot perform the activity at all due to hands and wrists symptoms' (1-5). Out of the 250 participants, 198 reported 'no difficulty'. Moreover, percentage of responses is shown in pie chart. The participants response for Household chores ranging from 'no difficulty' to 'cannot perform the activity at all due to hands and wrists symptoms'(1-5). Out of the 250 participants, 61.6% reported 'no difficulty'. 26.4% reported little difficulty, 5.6% reported Moderate difficulty, 3.2% reported intense difficulty and 3.2%reported that they cannot perform activities. The participants response for Carrying of grocery basket ranging from 'no difficulty' to 'cannot perform the activity at all due to hands and wrists symptoms'(1-5). Out of 250 participants 54.8% reported 'no difficulty'. 30.4% reported little difficulty, 8.4% reported Moderate difficulty, 2.8% reported intense difficulty, and 3.6% reported that they cannot perform activities. The participants response for Bathing and dressing ranging from 'no difficulty' to 'cannot perform the activity at all due to hands and wrists symptoms' (1-5). Out of the 250 participants, 84.4% reported 'no difficulty'. 9.20% reported little difficulty, 2.0% reported, Moderate difficulty, 1.4% reported Intense difficulty, 2.0%reported that they cannot perform activities. Functional status of Gripping of a phone handle percentage among the participants; Out of the 250

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participants, 67.6% reported 'no difficulty'. 21.2% reported little difficulty, 6.0% reported Moderate difficulty, 2.4% reported intense difficulty, and 2.4% reported that they cannot perform activities.

| Functional Status | Categories | Frequency (%) |
|---|---|---|
| Writing | 1.No difficulty | 170(68) |
| | 2.Little difficulty | 60(24) |
| | 3.Moderate difficulty | 14(5.6) |
| | 4.Intense difficulty | 3(1.2) |
| | 5.Cannot perform activities | 3(1.2) |
| Holding a book while reading | 1.No difficulty | 164(65.6) |
| | 2.Little difficulty | 68(27.2) |
| | 3.Moderate difficulty | 10(4) |
| | 4.Intense difficulty | 4(1.6) |
| | 5.Cannot perform activities | 4(1.6) |
| Buttoning of clothes | 1.No difficulty | 198(79.2) |
| | 2.Little difficulty | 32(12.8) |
| | 3.Moderate difficulty | 13(5.2) |
| | 4.Intense difficulty | 1(0.4) |
| | 5.Cannot perform activities | 6(2.4) |
| Household chores | 1.No difficulty | 154(61.6) |
| | 2.Little difficulty | 66(26.4) |
| | 3.Moderate difficulty | 14(5.6) |
| | 4.Intense difficulty | 8(3.2) |
| | 5.Cannot perform activities | 8(3.2) |
| Carrying of grocery basket | 1.No difficulty | 137(54.8) |
| | 2.Little difficulty | 76(30.4) |
| | 3.Moderate difficulty | 21(8.4) |
| | 4.Intense difficulty | 7(2.8) |
| | 5.Cannot perform activities | 9(3.6) |
| Bathing and dressing | 1.No difficulty | 211(84.4) |
| | 2.Little difficulty | 23(9.2) |
| | 3.Moderate difficulty | 6(2.4) |
| | 4.Intense difficulty | 5(2) |
| | 5.Cannot perform activities | 5(2) |
| Gripping of a Phone | 1.No difficulty | 169(67.6) |
| | 2.Little difficulty | 53(21.2) |
| | 3.Moderate difficulty | 15(6) |
| | 4.Intense difficulty | 7(2.8) |
| | 5.Cannot perform activities | 6(2.4) |

**Table 4:** Functional status of the participants (n=250)

## DISCUSSION

The results of this study showed that out of 250 subjects, 33.2% were having noticeable symptoms associated with prolong cell phone usage. In 2019 a cross-sectional study was conducted on "Prevalence of Cell phone elbow among young adults". Cell phone elbow was seen in 19.8% subjects. Current study showed higher prevalence than previous study. In 2019 Damodaran *et al.*, conducted study on prevalence of smartphone addiction among medical students and the results were relatively high (60.3%) [15]. Current study showed less prevalence than this study. In this research functional limitations due to production of symptoms were mentioned. 23.20% individuals faced decreased range of motion of elbow. Activities that include various household chores, opening jars, gripping telephone handle, holding a book while reading, writing, carrying heavy objects and various self-care activities i.e., bathing, dressing, and combing become difficult or limited. Among these tasks, 3.2% individuals could not perform any household activity at all and 3.6% individuals could not carry heavy objects i.e., grocery basket at all. 2% individuals were lacking even basic self-care activities i.e., dressing. Cell Phone Elbow is compression of ulnar nerve in the elbow and is the second most common neuropathy after carpal tunnel syndrome. The results shown by a study in 2019 on "Incidence of Cubital Tunnel Syndrome in the U.S. Military Population reported it affects up to 5.9% of population [16]. In 2018 a cross sectional study reported the prevalence of Cubital Tunnel Syndrome was 6.9% and was higher among the participants with longer length in the job as desk workers [17]. In 2019 a study on mobile phone addiction was conducted with 32.1 points and physical pain based on characteristics of mobile phone usage 1.86 points [18]. According to a study finding, agonizing elbow pain accounts for 27.6% of all elbow pain, and 44.4% of all hand pain, particularly when the hand is bent. According to the study's findings, 33.2% of the 250 participants had symptoms that could be linked to prolonged cell phone use. The results of the current study are better than those of the previously mentioned research. A cross-sectional study on selfie elbow was conducted in 2019 and depicts the strain placed on the elbow as a result of the individual extending (or occasionally bending) the elbow in an extremely strained position during the selfie. Selfie elbow is actually more of an unnatural and repetitive loading of the muscles around the elbow that creates micro ruptures, inflammation, and pain. This eventually cures with scarring, but it still results in recurring pain [19]. A cross-sectional observational study of undergraduate students with iPhone elbow was done in 2016, and the findings revealed that on the VAS scale, 35% of participants occasionally experience pain and 10.2% frequently complain of pain and achiness, suggesting diminished muscle strength. According to Rizvi *et al.*, study, people between the ages of 20 and 21 use smartphones more frequently. It's interesting to note that this study's findings revealed that 67.5% of students make calls and 60.7% utilise video chat, while reading and sending messages accounted for 43.7% and 39.8%, respectively [20]. In current study 65.6% were out of 250 individuals. Male and female ratio was not equivalent in this study. People had different occupations and household activities so symptoms may vary. All the data were collected from Punjab but it should be collected from all over Pakistan for

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more generalized results. This study did not investigate posture and body positions during usage of smart phones. Lifestyle modifications, Postural awareness, and educational campaigns are required to decrease cell phone usage health hazards. This study did not cover the treatment protocols so further experimental design is recommended for affected individuals.

## CONCLUSIONS

It is concluded that in comparison to earlier studies, the prevalence of mobile phone elbow was higher at 33.2% in the current study. Because this illness can result in functional incapacity if addressed, it should not be disregarded. Therefore, this study advises cell phone users to limit their mobile usage, avoid making lengthy phone calls, alternate between using their hands to reduce strain, and utilize hands-free and earbuds while taking calls.

## Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

# Prevalence of Left Ventricular Hypertrophy in End Stage Renal Disease Patients on Maintenance Hemodialysis

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## ABSTRACT

Among the hemodialysis population, left ventricular hypertrophy (LVH) is becoming a major cause of cardiovascular death, mainly due to myocardial infarction, heart failure, and arrhythmias. **Objective:** To determine the frequency of left ventricular hypertrophy in ESRD patients on maintenance hemodialysis. **Methods:** The Descriptive Cross-sectional study was conducted at Department of Nephrology, Liaquat University of Medical and Health Sciences Jamshoro. All patients above 18 years of age and below 65 years of age of both gender having end stage renal disease on maintenance hemodialysis with 3 months or more of maintenance hemodialysis were consecutively enrolled. On dialysis free day patients meeting inclusion criteria was sent for Trans Thoracic Echocardiography. Measurements was taken as inter-ventricular septal thickness, left ventricular end-diastolic diameter and left ventricular posterior wall thickness through parasternal long axis or short axis just distal to the tip of mitral valve leaflet. **Results:** The mean age of the patients was 53.54 ± 11.63 years. There were 72 (61.5%) males and 45 (38.5%) females. The mean duration of hemodialysis was 5.61 ± 0.97 months. The mean duration of ESRD was 7.23 ± 0.78 months. Type 2 diabetes mellitus was found in 73 (62.4%) and hypertension in 71 (60.7%) patients. The frequency of left ventricular hypertrophy was found in 53 (45.3%) patients. **Conclusions:** The frequency of left ventricular hypertrophy was found to be 45.3% in ESRD patients on maintenance hemodialysis.

## INTRODUCTION

Presence of structural, functional loss of kidneys and/or glomerular filtration rate (eGfr) less than 60 ml/min/1.73m2 for at least three months is known as chronic kidney disease [1, 2]. In Pakistan, prevalence of CKD is 12.5 to 16.6% [3]. It has five stages, patients with stage 5 of chronic kidney disease also known as end-stage renal disease requires renal replacement therapy, of which hemodialysis is the most widely used RRT all over the world [4]. In patients with ESRD, there are various changes in the structure of heart and its functions, these changes lead to increased morbidity and mortality from cardiovascular disease especially ischemic heart disease and cardiac failure [5]. Cardiovascular disease is more prevalent in patients who are suffering from chronic renal impairment than in the general population [6]. The risk of sudden cardiac death in these patients is four to 20 times higher as compared to the general population [7]. Apart from cardiovascular disease patients of regular hemodialysis are at increased risk of sudden cardiac death due to inflammatory state and hemodynamic overload of dialysis, these causes ischemia of myocardium during hemodialysis, decreased PR interval in the electrocardiogram, increased prevalence of ventricular repolarization changes, prolonged QT interval, and

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increased vulnerability of ventricular arrhythmias [8]. Left ventricular hypertrophy has been described as a more frequently occurred cardiovascular complication in ESRD patients on hemodialysis with prevalence of 70%, its presence in this patient population indicates poor outcome because it can be associated with the development of heart failure, ischemic heart disease, arrhythmias and sudden death [9, 10]. LVH occurs in concentric and eccentric patterns [11]. In patients with impaired renal function, these changes occur due to pressure and fluid overload [12]. Raised blood pressure, hypervolemia, anemia, chronic kidney disease, mineral and bone disorder (CKD-MBD), oxidative stress, and inflammatory state have been involved in causing left ventricular hypertrophy [13]. In hemodialysis patients' regression of LVH has been shown after successful kidney transplantation [14]. In patients with chronic kidney disease abnormal cardiac function or structure of the heart can be identified by using echocardiography [15]. Left ventricular hypertrophy is a risk factor for cardiac morbidity, mortality in patients on hemodialysis. Early detection and regression of left ventricular hypertrophy can cause reduction in cardiovascular mortality in uremic patients. Hence this study was conducted with the aim to determine the frequency of left ventricular hypertrophy in ESRD patients on maintenance hemodialysis.

## METHODS

The Descriptive Cross-sectional study was conducted at Department of Nephrology, Liaquat University of Medical and Health Sciences Jamshoro. 100 patients above 18 years of age and below 65 years of age of both gender having end stage renal disease on maintenance hemodialysis with 3 months or more of maintenance hemodialysis were enrolled via nonprobability consecutive sampling methods. Sample size was calculated via Openepi sample size calculator by taking prevalence of left ventricular hypertrophy in ESRD patients as 6.8% [9]. Patients with congenital heart diseases, poor transthoracic echo-images, with chest deformities and chronic obstructive airway disease were excluded from the study. Patients on maintenance hemodialysis meeting the inclusion criteria was selected for the study. Brief history, with special reference to duration of ESRD and hemodialysis, history of comorbid like T2DM, hypertension (on treatment verified by Physicians prescription) was taken. Heights was measured on stadiometer without shoes and cap in cm and later convert in meters. Weight was measured bathroom scale rounded 0.1 kg without shoes and in light clothes. On dialysis free day patients meeting inclusion criteria was sent for Trans Thoracic Echocardiography by a trained cardiologist. Echocardiography with a 3.3 MHz multiphase array probe was used to obtain two dimensional (2D) echocardiograms in subjects lying in the left decubitus position. Measurements was taken as inter- ventricular septal thickness, left ventricular end-diastolic diameter and left ventricular posterior wall thickness through parasternal long axis or short axis just distal to the tip of mitral valve leaflet. All the information obtained from patients was recorded on the predesigned Proforma". The study lasted 6 months from Oct 2020 to March 2021. The data were analyzed via SPSS version 21.0. Quantitative variables i.e., age, height, weight, BMI, duration of hemodialysis was recorded as Mean ± Standard Deviation (SD). Frequency and percentages were computed for qualitative variables like Gender and Echocardiographic Findings (Left Ventricular Hypertrophy). Effect modifiers like gender, age, BMI, duration of hemodialysis and ESRD and comorbid like T2DM vs H/o HTN was controlled through stratification. Post stratification Chi Square Test was applied, keeping p-value 0.05 as significant.

## RESULTS

The mean age of "the patients was 53.54 ± 11.63 years. Majority of the patients (n=72, 61.5%) were presented with >55 years of age. There were 72 (61.5%) males and 45 (38.5%) females (38.5%).

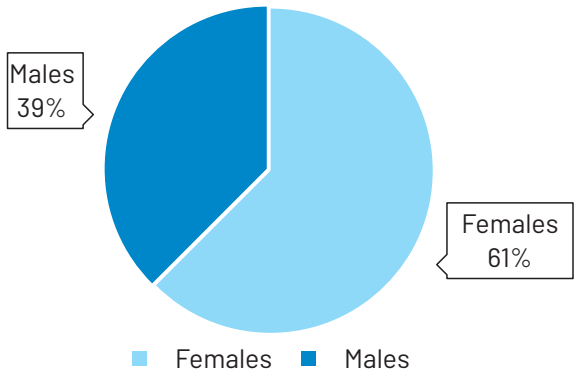


**Figure 1:** Gender distribution of patients (N=117)

The mean weight, height, and BMI of the patients was 60.05 ± 5.09 kg, 1.53 ± 0.05 m, and 27.67 ± 4.76 kg/m$^2$ respectively (Table No. 1). Most of the patients had ≤ 30 kg/m$^2$ of BMI. The mean duration of hemodialysis was 5.61 ±0.97 months (Table 1). Most of the patients (n=84, 71.8%) were presented with >5 months of duration of hemodialysis. The mean duration of ESRD was 7.23 ± 0.78 months (Table 1).

**Table 1:** Sample description (N=117)

| Variable | MEAN ± SD | Minimum | Maximum |
|---|---|---|---|
| Mean Age | 53.54 ± 11.63 Years | 18 | 65 |
| Mean Weight | 60.05 ± 5.09 Kg | 53 | 66 |
| Mean Height | 1.53 ± 0.05 m | 1.5 | 1.63 |
| Mean BMI | 27.67 ± 4.76 Kg/m2 | 18.70 | 33.0 |
| Mean Duration of Hemodialysis | 5.61 ± 0.97 Years | 4 | 7 |
| Mean Duration of ESRD | 7.23 ± 0.78 Months | 6 | 8 |

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Most of the patients (n=65, 55.6%) were presented with >5 months of duration of hemodialysis. Type 2 diabetes mellitus was found in 73 (62.4%) and hypertension in 71 (60.7%) patients. The frequency of left ventricular hypertrophy was found in 53 (45.3%) patients. A significantly higher association of left ventricular hypertrophy was observed with hypertension (p-value 0.009) while other variables were found to be insignificant (Table 2).

**Table 2:** Comparison of left ventricular hypertrophy among patients(N=117)

| Variable | Left ventricular Hypertrophy | | Total | p-value |
|---|---|---|---|---|
| | Yes | No | | |
| **Age of patients** | | | | |
| ≤55 | 20 (44.4) | 25 (55.6) | 45 (100) | 0.883 |
| >55 | 33 (45.8) | 39 (54.2) | 72 (100) | |
| Total | 53 (45.3) | 64 (54.7) | 117 (100) | |
| **Gender of patients** | | | | |
| Male | 23 (37.1) | 39 (62.9) | 62 (100) | 0.058 |
| Female | 30 (54.5) | 25 (45.5) | 55 (100) | |
| Total | 53 (45.3) | 64 (54.7) | 117 (100) | |
| **Diabetes mellitus** | | | | |
| Yes | 32 (43.8) | 41 (56.2) | 73 (100) | 0.682 |
| No | 21 (47.7) | 23 (52.3) | 44 (100) | |
| Total | 53 (45.3) | 64 (54.7) | 117 (100) | |
| **Hypertension** | | | | |
| Yes | 39 (54.9) | 32 (45.1) | 71 (100) | 0.009 |
| No | 14 (30.4) | 32 (69.6) | 46 (100) | |
| Total | 53 (45.3) | 64 (54.7) | 117 (100) | |

## DISCUSSION

Cardiovascular disease is the most common cause of death in patients with ESRD and accounts for most of the morbidity in these population [16, 17]. Dialysis patients are subject to atherosclerosis eventually leading to ischemic heart disease and myocardial dysfunction causing heart failure all which are highly prevalent. Eighty-four percent of patients at initiation of ESRD therapy have LVH, left ventricular (LV) dilatation, or low fractional shortening, and LVH has been found in 38% of patients with chronic renal failure (CRF) prior to the requirement for dialysis [18]. In our study, the frequency of left ventricular hypertrophy was found in 53 (45.3%) patients. In another study, LVH has been described as a more frequently occurred cardiovascular complication in ESRD patients on hemodialysis with prevalence of 70%, its presence in this patient population indicates poor outcome because it can be associated with the development of heart failure, ischemic heart disease, arrhythmias and sudden death [9, 10]. LVH occurs in concentric and eccentric patterns [11]. In patients with impaired renal function, these changes occur due to pressure and fluid overload [12]. Raised blood pressure, hypervolemia, anemia, CKD-MBD, oxidative stress, and inflammatory state have been involved in causing left ventricular hypertrophy [13]. In hemodialysis patients' regression of LVH has been shown after successful kidney transplantation [14]. In patients with chronic kidney disease abnormal cardiac function or structure of the heart can be identified by using echocardiography [15]. The presence of LVH or LV dilatation (or both) is clearly a poor prognostic factor [19-21]. The current study was designed to determine LVH in ESRD patients on maintenance hemodialysis (MHD), due to the significant discrepancy in the percentage determined in previous studies and because no such study has been conducted in our targeted population. This result was more in agreement with results of Ifeoma and Tian, they determined it in 95.5% and 68.8% patients respectively, both which were over 50% and significantly high [22, 23]. The study by Kadir *et al.*, determined it in 46% and 46.42% patients respectively both which were less than 50% and considerably lower [24]. A significant association of LVH was found with hypertension. These findings are more in agreement with Kawamura *et al.*, study as they showed that 42.31% had hypertension [25]. However, anemia and diabetes mellitus were also considerably higher in their study which was not found in our study. These results signify that anemia was the most significant contributing risk factor leading to LVH in patients on MHD followed by hypertension and then diabetes mellitus. London noted that anemia is present in most patients initiating dialysis and that it could explain the high prevalence of LVH in these patients [26]. In a study by Ulasi *et al.*, a strong relationship was found between anemia and the prevalence of LVH in patients with chronic renal failure [27]. Anemia has been consistently associated with cardiovascular morbidity and LVH in the ESRD population and the results of this study are consistent with those in the literature [28]. Anemia leads to an increase in cardiac workload which subsequently leads to development of LVH. Several studies have been done to demonstrate if the reversal of anemia, using erythropoietin therapy, results in partial regression of LVH in the dialysis population with conflicting results [29].

## CONCLUSIONS

The frequency of left ventricular hypertrophy was found to be 45.3% in ESRD patients on maintenance hemodialysis.

### Conflicts of Interest

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Original Article

# Prevalence of Musculoskeletal Pain Among Nursing Interns in Jinnah Hospital Lahore

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## ABSTRACT

Musculoskeletal pain seeks high importance due to its occurrence among the people of any profession. **Objectives:** To find the prevalence of musculoskeletal pain and its associated work-related factors among nursing interns in a teaching public hospital of Lahore. **Methods:** Analytical cross-sectional study design was used. Study setting for this research was Jinnah Hospital Lahore. Study population was comprised on all nursing interns working in Jinnah Hospital Lahore. Cluster sampling technique was used to collect the data. **Results:** The study's findings showed majority of nursing interns were between the ages of 20 and 22, accounting for 51% of them. About 125 respondents were married with percentage of 68.5%. More Half of the population (57.4%) is experiencing pain in the neck and shoulder regions. About two third populations of interest is experiencing pain or discomfort in lower back. Approximately half of the population (48.9%) is experiencing ankle and feet pain symptoms. **Conclusion:** The study concluded that musculoskeletal discomfort is highly common among nursing interns. Several additional body parts are frequently impacted in addition to the lower back.

## INTRODUCTION

Musculoskeletal pain is a significant health care issue. It is most common type of pain affecting ligaments, tendons, joints, nerves, and muscles. The most commonly affected parts are hands, forearms, shoulders, upper back, lower back and lower extremities [1]. Among occupational health problems, it is the most affecting health issue in the working atmosphere [2]. Nursing interns are integral part of public hospital as they are working in full capacity of nursing interns staff under supervision [3]. In a population of Asian nurses, studies have shown a higher annual prevalence of musculoskeletal disorders (MSDs) in at least one human body part and/or region that ranged between 40 and 95%; in Western populations, the low back, neck, and shoulders are the most severely affected body parts, with prevalence rates of 29-64%, 34-63%, and 17-75%, respectively. [4, 5]. On the other hand, a narrative literature review on MSDs over the previous 12 months among female nurse staff revealed that the knee and ankle/foot regions were most affected by MSDs. The prevalence of MSDs varied between 7.2 and 77% in the knees and between 3.2 and 100% in the ankles. Between 8.5 and 10.5% of people had MSDs in their lower legs (the shins), and between 11 and 100% of people had them in their thighs and hips [6]. In Pakistan a study conducted by Abdul Rehman reported 95(85%) neck pain, 89(81%) wrist/hand pain, 86 (79%) lower back pain and 78(70%) shoulder pain among surgeons [7]. International Association for the Study of Pain (IASP) has explained the pain stating that it is "a terrible physical and nervous discomfort related with real or possible tissue harm, or depicted concerning such harm" [8]. Thus, pain is

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that experience we relate to real or potential tissue harm [9]. Musculoskeletal pain affects muscles, tendons, bones, ligaments, joints etc. For example, the outcome of fracture is unbearable pain [10]. Musculoskeletal pain (MSP) in the nursing interns professional considered as prevailing health issue and the prevalence of these disorders is becoming higher in the last few years [11]. Development of musculoskeletal pain in nursing interns' professionals is probably higher as compared to others. It is extensively seen in frontline health care professionals especially nurses [12]. The most typical symptoms are pain, exhaustion, and a disruption in regular sleep patterns, with many describing it as their whole body is in pain or their muscles feeling pulled or overworked. This pain can be confined to a body area or widespread [13]. There are some tasks that are physically demanding e.g. patient handling and moving them under inimical situations [14]. Patient condition is also a great contributor e.g. patient body weight, poor cognition, disabilities or dependency, are such challenges that every nurses has to encounter every day [15]. It has been shown that among the helping professions, nursing interns have a high risk and demanding job by nature [16] , and a number of stresses have detrimental effects on their health and ability to handle job demands. There are multiple risk factors involved in the development of MSPs in hospitals [17]. Duty hours and prolonged shifts predispose the nurses to develop WRMSP in the hospital. Inadequate staffing and long working hours is also a contributor to developing these pains [18]. Shifting the patient is considered an important step in the hospital care provided to the patient for any ongoing assessment, diagnosis purpose, any procedure, or treatment purpose [19]. Health professionals frequently get injuries while transporting patients from one bed to another or from one bed to a wheelchair to another [20]. Nurses in the health care area considered as backbone of the health profession performing broad range tasks. This research is carried out to explore the prevalence of MSP among nursing interns which will be definitely fruit-full for further researchers, and also best for policy makers for make to make new protocols for better health of internees who are very important part of nursing interns task force. His study find the prevalence of musculoskeletal pain and its associated work-related factors among nursing interns in Jinnah Hospital Lahore.

## METHODS

An Analytical cross-sectional study design was used to conduct the study. The study setting for this research was Jinnah hospital Lahore. Study population was comprised on all nursing interns working in Jinnah hospitals Lahore. It was completed in nine months. Convenient sampling technique was used to collect the data. The sample size of 190 cases is calculated with a 95% confidence interval, a 7% margin of error, and 10%Attrition rate. Nursing Interns have more than two month's internship experience. Participants aged between 20 to 35 years and those who has not received any certification regarding musculoskeletal pain were included in the study**.** Interns with mental disorder, pregnancy and those who has Known history of musculoskeletal disorders are excluded from study. Data was collected from all major departments including emergency, medical, surgical, operating rooms and Intensive care units of Jinnah Hospital Lahore. All the interns of these departments were selected to collect the data. Firstly written informed consent to participate in the study was taken from the participants. One week time was given to the participants to complete the Performa. Seventy percent of the participants returned filled Performa and 20% did not returned the questionnaire. They were given more time to complete the Performa and they returned it after one week. The questionnaire consists of three sections including, socio demographic characteristics of the participants, Nordic musculoskeletal pain questionnaire and Visual Analogue Scale. The musculoskeletal pain was assessed using the Nordic musculoskeletal pain questionnaire and Visual Analogue Scale. Visual Analogue Scale was used to analyze mild, moderate, and severe pain. Mild Pain intensity was scored on 1 to 3 scale, Moderate Pain intensity was scored on 4 to 6 scale, and Severe Pain intensity was scored on 7 to 10 scale. SPSS version 25.0 was used to analyses the data. Calculated descriptive statistics included frequency and percentages.

## RESULTS

The study of the respondents' demographic data revealed some important details about their age, marital status, and number of children, current shift, and department. The majority of nursing interns, for instance, were between the ages of 20 and 22, accounting for 51% of them. Also, 81 nursing interns were between the ages of 23 and 24, making up 42.6% of them, while 12 were between the ages of 25 and 26, accounting for 6.3%. About 125 respondents were married with percentage of 68.5% whereas 65(34.2%) were single. No divorce or widow was found. To know the internship period of nursing interns, three categories were made. 52 (27.4%) were having 4-6 months of duration. 100(52.6%) were having 7-10 months of internship period and 38 nursing interns with 10-12 months of internship period. Data was mostly gathered during the morning and evening shifts. Nursing interns made up 81 (42.6%) of the morning shift and 81 (42.6%) of the evening shift. There were just 28 interns reported to be working nights. Five

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categories were used to group departments. The operating room, intensive care unit, medical and surgical wards, and emergency room. 22 (11.6%) nursing interns were discovered in medical wards, 60 (31.6%) in surgical, 45 (23.7%) in the operating room, and 35 (19.5%) in the emergency room. There were 26(13.7% from ICU/CCU).

| Demographic characteristics | | N (%) |
|---|---|---|
| Age | 20-22 | 97 (51.1%) |
| | 23-24 | 81(42.6%) |
| | 25-26 | 12 (6.3%) |
| Marital Status of respondents | Unmarried | 125(68.5%) |
| | Married | 65(34.2%) |
| No of children | No children | 162(85.3%) |
| | 1-2 children | 28(14.7%) |
| Internship period | 4-6 months | 52(27.4%) |
| | 7-9 months | 100(52.6%) |
| | 10-12 months | 38(20.0%) |
| Current shift of duty | Morning | 81(42.6%) |
| | Evening | 81(42.6%) |
| | Night | 28(14.7%) |
| Department | Medical | 22(11.6%) |
| | Surgical | 60(31.6%) |
| | Operation theater | 45(23.7%) |
| | Emergency | 37(19.5%) |
| | ICU/CCU | 26(13.7%) |

**Table 1:** Demographic characteristics of respondents

Table 2 lists the various work-related issues that nursing interns had to deal with. It has been determined that nursing interns displayed more musculoskeletal discomfort at work. The shifting of large goods, machinery, and patient transfers were seen when 155(81.6%) percent of the workforce was carrying big loads, such as those weighing more than 20 kg. 171 (90%) of the nursing interns were hunched over while working. Similarly, 182 95.8% of nursing interns were seen working with bent posture for extended periods of time, as well as bent and twisted position. Due to long shifts and continuous standing, for example in OT, 161 nursing interns complained of mental tiredness. 131 (68.9%) of them said that the lack of doctors, nursing interns, or other paramedic professionals made their jobs harder. 125 (66.8%) of the nursing interns were overseen by other employees. They had 94 (49.8%) part-time jobs as a result of certain financial difficulties. There were 21 (11.7%) interns who missed more than six weeks of class because of an injury connected to WRMSDs. 131 people (68.9%) were dissatisfied with the standard break period, which was only 30 minutes, and they did not feel content or relaxed after the break. 104 interns complained that their working conditions were interfering with their personal lives. 95.3 percent of the 181 nursing interns were manually managing patients.

| Variable | | N (%) |
|---|---|---|
| Pushing/pulling loads more than 20 kg | Yes | 155(81.6%) |
| | No | 35(18.4%) |
| Often work slightly bent posture | Yes | 171(90%) |
| | No | 19(10%) |
| Often work in heavily bent posture | Yes | 154(81.1%) |
| | No | 36(18.9%) |
| Slightly twisted posture for long | Yes | 182(95.8%) |
| | No | 8(4.7%) |
| Bent and twisted posture | Yes | 181(95.3%) |
| | No | 29(15.3%) |
| Mental exhaustion | Yes | 161(84.7%) |
| | No | 30(15.3) |
| Work hindered by the absence of others | Yes | 131(68.9%) |
| | No | 59(31.1%) |
| Supervision of other | Yes | 125(65.8%) |
| | No | 65(34.2%) |
| Having part time jobs | Yes | 94(49.5%) |
| | No | 96(50.5%) |
| Being absent for more than 6 months | Yes | 21(11.1%) |
| | No | 169(88.9%) |
| Normal breaks sufficient | Yes | 59(31.1%) |
| | No | 131(68.9%) |
| Feeling rested after the breaks | Yes | 59(31.1%) |
| | No | 131(68.9%) |
| Work conditions affect private life | Yes | 104(54.7%) |
| | No | 86(45.3%) |
| Manually handling patients | Yes | 181(95.3%) |
| | No | 9(4.7%) |

**Table 2:** Characteristics of respondents' jobs

Table 3 demonstrates that nursing students are feeling discomfort in many parts of their bodies.. More Half of the population (57.4%) is experiencing pain in the neck and shoulder regions for last 12 months and 114(60%) had neck pain for last 7 days. About two third populations of interest is experiencing pain or discomfort in lower back for 12 months and 122(64%) had lower back pain for last 7 days. Approximately half of the population 93(48.9%) is experiencing ankle and feet pain symptoms for 12 months and 102 (53%) participants had ankle and foot pain for 7 days.

| Body region involved | Frequencies & Percentage of work-related musculoskeletal pain in the last 12 months | Frequencies & Percentage of work-related musculoskeletal pain in the last 7 days |
|---|---|---|
| Neck | 109(57.4%) | 114 (60%) |
| Shoulder | 107(56.3%) | 100 (52%) |
| Upper back | 25(13.2%) | 13 (6%) |
| Elbow | 11(5.8%) | 16(8%) |
| Wrist/hands | 33(17.4%) | 28(14%) |
| Lower back | 126(66.3%) | 122 (64%) |
| Hips/thighs | 66(34.7%) | 53(27%) |
| Ankle/foot | 93(48.9%) | 102 (53%) |

**Table 3:** Prevalence of work-related musculoskeletal pain

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## DISCUSSION

The present study advances our understanding of the incidence of musculoskeletal discomfort during work among nursing interns at Jinnah Hospital in Lahore. The findings of this study showed that nursing interns experience discomfort in multiple body parts and locations. More than half of the population 109(57.4%) participants reported neck pain while performing their tasks. These findings are similar to a study conducted among nurses in University College Hospital Ibadan, Nigeria where 78.0% respondents reported shoulder pain and 90.7% reported neck pain [21]. A possible explanation is that the double burden of juggling work and family obligations can cause neck and high back pain, which are frequently diagnosed as symptoms of "trapezius myalgia". Similarly Robert Latina's cross-sectional study also revealed that the prevalence of low back pain was 90.2% overall, 80% in the previous year, and 44.5% in the previous week [22]. The present study showed that about two thirds of the nursing interns having lower backs pain or uncomfortable. Tendons, bursas, and joints are frequently impacted by mechanical load in the extremities. Other structures in the back, such the muscles and intervertebral discs, are perhaps more susceptible to injury. Similarly a study conducted in Estonia reported that 57% nurses have Lower back pain [23]. One explanation could be that pain in the extremities frequently results from ongoing wear and tear. In addition, another study done in Brazil found that 79.3% participants had lower back pain [24]. The frequency of low back pain has been the subject of numerous studies. Some previous studies showed that hospital nurses experienced a significant prevalence of lower back pain on a widespread basis [25, 26]. As in mainland Europe, 85.9%nursing workers showed a significant frequency of Lowe Back Pain in Czech [27]. Low back pain was more common in service industries with significant physical demands, just like discomfort in the extremities. Low back pain risk factors include heavy lifting and routine bending and twisting at work. The distinct pathophysiological mechanisms behind limb pain and low back pain could be one explanation for the discrepancy in their epidemiological distribution. Age-related increases in pain in the extremities were more common in women than in men, and they were more prevalent in service industries with high physical demands, such as nursing homes. Pain in the hands or wrists was more common among single people. Two thirds of the nursing population, it was found statistically, had postural problems. Long lengths of time spent working in the same position have been demonstrated to be uncomfortable for them. Many studies into postural problems revealed that having bad posture may result in musculoskeletal pain [28].

## CONCLUSIONS

According to the study's findings, musculoskeletal discomfort is highly common among nursing interns. Several additional body parts are frequently impacted in addition to the lower back. The incidence rates change depending on the demographics of the aides, how many hours they work each week, and the type of services they provide.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Prevalence of Post Recovery Symptoms among Recovered Cases of COVID-19 in Pakistan

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## ABSTRACT

COVID-19 has taken the world by surprise in terms of healthcare readiness and impact on daily life. Existing literature regarding the patient's health status following COVID-19 infection is scant. **Objective:** To analyze the current status of post-recovery symptoms among COVID-19 recovered patients in Pakistan. **Methods:** It is a descriptive web-based cross-sectional study. Data were gathered by using a Google form by sharing anonymous online questionnaire, comprised of both open and close ended questions. Then interpreted, and presented using tables and graphs using descriptive statistics through IBM SPSS 26. **Results:** Shortness of breath (27%) followed by fatigue (23.5%) seen to be more common symptoms still prevailing in the population. 69.2% of the population had no evidence of comorbidity but are still experiencing post COVID symptoms. Few cases reported experiencing insomnia and tooth sensitivity - 11% and 12% respectively. **Conclusions:** The results of this study showed that COVID-19 patients should be worried about their health even after they get better. A thorough analysis should be done to improve the health of people who have gotten better but are still dealing with long-term problems. Even though it's a new virus and research is still being done, it needs to be treated with care.

## INTRODUCTION

COVID-19 changed how we learn, work, and live. Some changes are not lasted, but others are. The post-pandemic world is not the same as the pre-pandemic world. Many lives were lost as a result of the lack of a strong healthcare system during the time of COVID. As a result, all countries recognized the importance of a strong healthcare system and began to take steps to make it a reality [1]. Too many countries were affected by COVID-19's external shocks without universal social protection, strong public health systems, a plan to reach net-zero carbon emissions by 2050, or a real economy with good jobs that can last. We live in a world where there is more inequality between and within countries [2]. The COVID pandemic disproportionately affected the most vulnerable people. Some of the changes caused by the COVID pandemic can't be changed back. Along with these changes, we need to make more, like protecting the weak, to make society more open and fairer for everyone. Numerous ongoing health issues that can last for weeks, months, or years are considered as post-COVID conditions. Although those who experienced severe COVID-19 illness are more likely to develop post-COVID conditions, anyone who has been exposed to the virus that causes COVID-19 is susceptible. The world's economies, societies, and health systems changed in significant ways after the coronavirus pandemic. In addition to posing difficulties in disease control and crisis management, the COVID-19 pandemic had far-reaching and far-lasting effects on nations,

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communities, and international solidarity. In fact, everyone lost something during this crisis and now struggling with the after effects of the deadly virus [3]. According to Centers for Disease Control and Prevention (2021), when compared to those who have received the COVID-19 vaccination, those who are unvaccinated and contract the disease may be at a higher risk of developing post-COVID conditions [4]. The failure to recover to baseline health after an acute COVID-19 illness is one definition of post-COVID conditions. Conditions that occur after the acute COVID-19 illness have subsided may include the emergence of new symptoms, the return of old ones, or the exposure of a previously undiagnosed condition [5]. After COVID-19 infection, residual symptoms are referred to as "Long COVID," but this condition hasn't been adequately described. It is currently best described as a multi-organ illness with symptoms that present over a period of more than two months and are cyclical, progressive, and multiphasic [6]. Consequences and functional limitations following post- COVID can have far-reaching effects on a patient's health and well-being. People who have post-COVID conditions or long-term COVID may have a number of symptoms. Not everyone may have the same symptoms after COVID. People with post-COVID conditions may have health problems caused by different types and combinations of symptoms that happen at different times. Even though most patients' symptoms slowly get better over time. For some people, conditions that happen after COVID-19 illness can last for weeks, months, or even years and can sometimes make them unable to work [7]. If a person with long-term COVID is significantly limited in a major bodily function or other major life activity, this is determined without taking into account any medications, treatments, or other steps the person takes to lessen or deal with symptoms. Even if the impairment comes and goes, it is still a disability if it makes it hard to do something important in life when it is present. Long COVID can make it hard to do something important. There are many ways in which a person with long COVID could be severely limited in a major life activity [8]. Some people get new health problems after getting COVID-19. Some people, especially those who had a severe COVID-19 illness, have long-lasting effects on more than one organ or autoimmunity that can last for weeks, months, or even years. Effects that affect more than one organ can affect the heart, lungs, kidneys, skin, and brain. Because of these effects, people who have had COVID-19 may be more likely to get new health problems like diabetes, heart problems, blood clots, or neurological problems than people who have not had COVID-19 [9]. Long-term COVID patients may experience respiratory symptoms like wheezing, coughing, and shortness of breath. Patients have also reported other symptoms such as fatigue, dizziness, depression, anxiety, and problems remembering or concentrating. Our study aimed to describe the current situation of patients who have ever had COVID-19 infection and link this to long COVID symptoms.

## METHODS

It was a descriptive web-based cross-sectional study intended to assess "Prevalence of post recovery symptoms among recovered cases of COVID-19 in Pakistan". This study was carried out across big cities of Punjab including Multan, Khanewal, Islamabad, Rawalpindi, Sargodha, Sialkot, Okara, Hyderabad, Faisalabad and DG Khan, Pakistan. This study was conducted during a period of two months started from August 2022 to January 2023. The convenience sampling technique was used formally for data collection. Almost 37 email addresses have been taken from the database of EQUIP Research & Development Consultants of the known and recovered patients of COVID-19 across mentioned cities. Also, they were instructed to send the Google form so that more COVID 19 recovered patients might be included in the study. Furthermore, snowball sampling technique was also used to find participants, and advertising the invitation to take part in the study on social media was also part of the process. The Sample Size Calculator (Raosoft®), accessible at raosoft.com/samplesize.html, was used to determine the sample size for this investigation. The response distribution was assumed to be 50%, and the margin of error was set at 5% with a 90% confidence level. For this investigation, a minimum determined sample size was 267. In accordance with the inclusion and exclusion criteria of the study, 30 completely filled forms were required from the targeted areas. In this regard, special attention was paid so that the questionnaire would be equally shared among study participants from targeted areas of Pakistan. As, it is a web-based study so emails and reminders were sent to the participants over and over again to fill the questionnaire. It was hard to motivate the participants as people were reluctant to share their health issues. So, only fully completed 253 survey results were involved for analysis. Considering the study's inclusion and exclusion criteria, 5 of the 267 participants didn't fill out the entire form, and 9 of them were beyond the age of 70. Due to this, they were disqualified from the study by adhering to the exclusion criteria. Eventually, there were 253 persons in the total sample size, with ages ranging from 10 to 70 and confirmed COVID-19 status. Inclusion Criteria: Age range 10-70 years, Confirmed COVID-19 patients. Exclusion Criteria: Below 10 and above 70 years of age, Non-confirmed COVID-19 patients. Data were gathered by using

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a Google form, an anonymous online questionnaire was created in consultation with subject matter experts, and previously validated questionnaires on lingering symptoms following COVID-19 infection were modified, which is comprised of both closed-ended and open-ended, covering demographic information about respondents, items, and questions pertaining to the research topic were included in a self-structured questionnaire that was created and used to generate numerical data. A pilot test with 20 participants was conducted, and necessary changes were made to improve the clarity of the questions. The results of the pilot testing were not incorporated into the final analysis. To organize and give meaning to the data, data analysis was done. Data that were missing were examined before analysis. Data entry was completed using an excel spreadsheet by importing data from a Google form. IBM SPSS 26.0, which was downloaded from IBM Support, was then used for analysis. The collected data were organized, interpreted, and presented in the form of tables and graphs by using descriptive statistics.

## RESULTS

The study included a total of 253 (Male: 56.5%, Females: 43.5%) with maximum age range (41.7%) between 21-30 years of post-recovered patients of COVID-19. Majority of the patients belonged to Multan (21.2%) and were married (51.7%). Major portion of the respondents were involved in private job (38.8%) while 37.5% responded that they lost 10-15 working days during COVID-19 infection (Table 1).

**Table 1:** Respondents Demographics (n=253)

| Demographic Variables | Category | Frequency (%) |
|---|---|---|
| Age | 10 - 20 | 21 (8.3%) |
| | 21 - 30 | 106 (41.7%) |
| | 31 - 40 | 51 (20.2%) |
| | 41 - 50 | 54 (21.4%) |
| | 51 - 60 | 18 (7.1%) |
| | 61 - 70 | 3 (1.3%) |
| Gender | Male | 143 (56.5%) |
| | Female | 110 (43.5%) |
| City | Multan | 54 (21.2%) |
| | Khanewal | 35 (14%) |
| | Islamabad | 23 (9.1%) |
| | Rawalpindi | 16 (6.5%) |
| | Sargodha | 14 (5.4%) |
| | Sialkot | 13 (5.2%) |
| | Okara | 11 (4.5%) |
| | Hyderabad | 33 (13.1%) |
| | Faisalabad | 36 (14.2%) |
| | DG Khan | 18 (6.8%) |
| Marital Status | Married | 131 (51.7%) |
| | Single | 116 (45.9%) |
| | Divorce/Separation | 0 (0.0%) |
| | Widow | 6 (2.4%) |
| Current Employment Status | Business | 24 (9.4%) |
| | Private Job | 98 (38.8%) |
| | Daily Wager | 15 (5.9%) |
| | Student | 59 (23.5%) |
| | Government Job | 30 (11.8%) |
| | Unemployed | 18 (7.1%) |
| | Researcher | 3 (1.2%) |
| | Retired | 3 (1.1%) |
| | Housewife | 3 (1.2%) |
| Effect of COVID 19 on Employment Status (No. of days loss) | 1-5 | 16 (6.4%) |
| | 5-10 | 56 (22.3%) |
| | 10-15 | 95 (37.5%) |
| | 15-20 | 44 (17.2%) |
| | 20-25 | 30 (11.9%) |
| | >25 days | 12 (4.7%) |

43% of respondents said that 2021 was the year their first symptom manifested. And 60% of respondents reported that the symptoms were mild to moderate in severity, while 49.9% said that the symptoms lasted for 5 to 10 days (Figure 1).

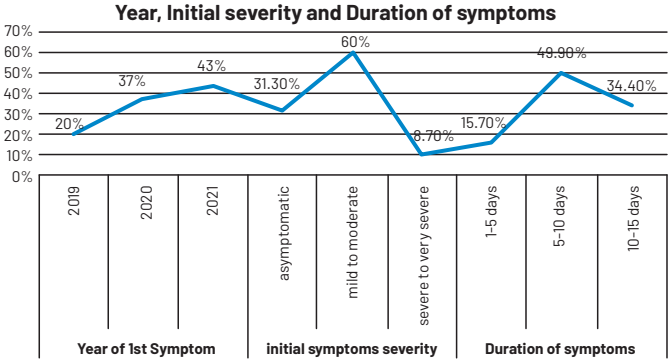


**Figure 1:** Initial Year, Severity and Duration of symptoms

Cough (25%) followed by fever (21%) were the major symptoms at first two weeks of infection (Figure 2).

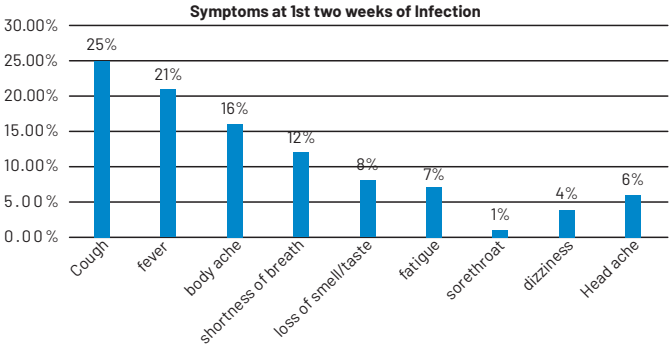


**Figure 2:** First two weeks symptoms

Figure 3 shows that the two main symptoms that individuals still suffer after recovering from COVID-19 are shortness of breath (27%) and fatigue (23.50%).

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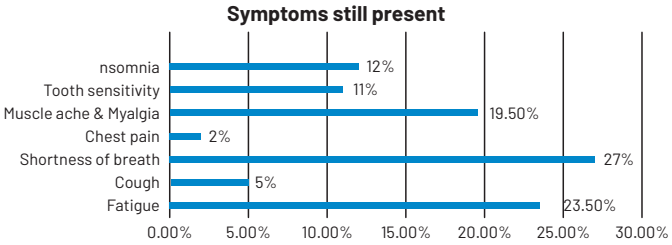


**Figure 3:** Symptoms still prevailing

Table 2 summarizes the overall health status of the respondents. Most of the affectees (56.6%) preferred to stay at home. The majority (69.2%) believed they had no comorbid conditions and did not get tested (61.5%) for COVID-19. High percentage of respondents reported visual disturbances followed by chest pain (20.3%).

**Table 2:** Respondents overall health status (n=253)

| Demographic Variables | Category | Frequency (%) |
|---|---|---|
| Stayed at home, hospitalization or ICU | Stayed at home | 143 (56.6%) |
| | Daily clinic visit | 64 (25.3%) |
| | Hospitalization without ICU | 34 (13.3%) |
| | Hospitalization with ICU | 12 (4.8%) |
| Comorbidities (2/ more diseases) | No comorbidity | 175 (69.2%) |
| | At least 1 comorbidity | 78 (30.8%) |
| COVID Test | Antigen Test (Rapid Test) | 66 (25.9%) |
| | PCR | 32 (12.6%) |
| | No test | 155 (61.5%) |
| Overall Health Impact | Chest pain (cardiac/angina) | 51 (20.3%) |
| | Palpitation | 34 (13.4%) |
| | Stroke (sudden numbness/ weakness) | 49 (19.2%) |
| | Visual disturbances (blurred vision) | 59 (23.3%) |
| | Cognition | 35 (13.9%) |
| | Anxiety/ Depression | 18 (7%) |
| | Weight loss | 4 (1.5%) |
| | Weight gain | 3 (1.4%) |

## DISCUSSION

There is insufficient literature examining the long-term effects of COVID-19 patients who are either released from the hospital or recovered through self-medication and quarantine. This cross-sectional study investigates the prevalence of post-recovery symptoms among recovered cases of COVID-19 in Pakistan. Several studies reported that patients who had recovered from COVID-19 disease continued to experience symptoms in ranges from 13.3% to 96% [10-14]. Our study represents almost the entire COVID-19 illness spectrum because it depicts the current situation of recovered COVID-19 patients with varying degrees of infection severity, ranging from mild to severe. However, it is unclear why some COVID-19 survivors still experience long-term symptoms. It is believed that COVID-19's long-term effects are related to SARS-capacity CoV-2's to occasionally cause a significant provocative response [15-17]. In this study, it was not possible to figure out how different kinds of variants affect the post-COVID-19 syndrome. But getting vaccinated keeps you from having to go to the hospital, so even with concerns like the delta variant, the number of serious cases went down [18]. Therefore, additional research is required to clarify how the various variants contribute to post-COVID-19 syndrome and how vaccination affects it. Contrary to the previous studies [10-13], shortness of breath (27%) followed by fatigue (23.5%) as shown in (Figure 3) are the most prevalent symptoms which are still present in recovered patients. This study shows the existence of muscle ache & myalgia and insomnia 19.5% and 12% respectively (Figure 3) which is in accordance as well as contrary to the previous study in which depression, anxiety, and insomnia were found to be prevalent in 15.97%, 15.15%, and 23.87% of the population, respectively [19, 20]. Cardiac manifestations are another well-defined disorder that predicts patient mortality in COVID-19 [21]. When the pandemic is over, it is expected that a significant number of patients will have residual lung and cardiac disorders. Our study contradicted this finding, as Table 2 shows that 23.3% of participants reported experiencing visual disturbances followed by chest pain (20.3%) and stroke (19.2%). The cause of post-COVID illnesses is unknown, but it is thought to be due to virus-specific pathophysiologic changes, a long-term inflammatory response to severe infection, and possibly related to post-intensive care illness. [22, 23].

## CONCLUSIONS

Following the completion of this study, it became clear that many patients were dealing with new health issues, and they are needed to be advised to continue regular check-ups in order to sustain their health. The study also revealed a high proportion of long-term symptoms among recovered cases of COVID-19. The results of this study raise alarming health concerns for COVID-19 patients even after recovery. For the purpose of improving the health of recovered patients, who are still coping with long-term problems, a thorough analysis should be conducted. Despite the fact that it is a new virus and research is still being done, it needs to be handled carefully.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Prevalence of Transmissible Infectious Diseases among Healthy Blood Donors in Faisalabad, Pakistan

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## ABSTRACT

Blood transfusions are necessary due to the increased incidence of blood diseases and an increase in automobile accidents. In healthcare systems with limited resources, the provision of safe blood products is hampered by transfusion-transmitted diseases (TTIs), such as the hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), syphilis, and malaria. **Objective:** To determine how common TTIs are among blood donors in Faisalabad. **Methods:** Immuno-chromatographic technique (ICT) kits and thick film (malaria) screening were used to test donors for HBV, HCV, HIV, syphilis, and malaria. **Results:** Among 1500 donors, prevalence of HCV was highest (n=106), followed by HBV (n=42), syphilis (n=11), and malaria (n=3). One positive case was reported as HIV. Between the ages of 21 and 40, donors who tested positive were more prevalent. **Conclusions:** By more carefully evaluating and screening each donor before selecting them for blood donation, safe blood transfusions can both increase recipient safety and reduce the spread of TTIs.

## INTRODUCTION

Even though giving blood might benefit patients' quality of life, it is also one of the main ways that infections spread. Patients, physicians, and governments who want to ensure a safe blood supply are very concerned about TTIs. Some of the most common TTIs include HIV, HBV, HCV, *Treponema pallidum* (Syphilis), and malarial parasite [1]. Everyone has the right to safe blood, claims the World Health Organization (WHO). For safe blood, a national program for donor selection, recruitment, retention, and education is required. As a result, there will be fewer donors available who might infect the receivers [2]. The WHO estimates that 118.2 million blood donations are made worldwide, with 58 percent taking place in low- and middle-income countries [3]. Only 38 countries, in 2006, acquired more than 75% of their blood supplies from families; the remaining countries paid professional blood donors to provide the blood they needed [4]. Additionally, the WHO advises that each donation of blood be tested for those five pathogenic pathogens. The likelihood of morbidity and mortality linked to blood transfusions will increase with the transfusion of inflamed blood and blood additives. The effects on the individual, their family, and their communities are of extreme intensity [3]. In Pakistan, a country of almost 1.8 billion people, 1.5 million bags of blood are required annually; in the two main cities of the country, Karachi and Lahore, the private sector

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meets 60% of the need and the public sector 40% [5]. In Pakistan, about 1.5 million units of blood are collected annually, with the bulk coming from replacement donors, who are typically the patient's family or close friends who want to lend a hand in times of need [4]. Although Pakistan has a high rate of HBV and HCV, recent research has raised questions regarding an increase in other TTIs, including HIV and Syphilis [6]. The precise prevalence of TTIs in our population is unknown due to a lack of information, the lack of screening tests, the limited availability of healthcare services, and the absence of surveillance systems [7]. This study's main goal was to determine the prevalence of these five TTIs, which are distributed through blood donation, to rule out the presence of TTIs in healthy donors of different ages and genders at public and private blood centers in the district of Faisalabad, Pakistan. Detecting asymptomatic patients among healthy donors is another goal, as is making it possible to eliminate risk factors for TTIs among healthy donors to prevent the need for blood transfusions.

## METHODS

This hospital-based prospective cross sectional study received approval from the institutional ethics committee and was carried out with the consent of the hospital's administrator in accordance with the Helsinki Declaration. The samples were analyzed in the blood banks at the Allied Hospital, DHQ Hospital, Regional Blood Bank, and Mujahid Hospital in Faisalabad, Pakistan. These hospitals offer medical care to the local people as well as those who come from other areas of the region. The study was carried out between March and July 2022. The blood donors' demographic data was documented. Each potential blood donor was required to complete a questionnaire about their general health and medical history. We chose donors who were between the ages of 18 and 50, had hemoglobin levels larger than or equal to 12 mg/dl, pulse rates of 50 to 100 beats per minute, weights greater than or equal to 50 kg, normal blood pressure, and skin free of any lesions at the site of venipuncture. Prior to screening, all blood donors underwent regular medical examinations to check for exclusion criteria. Additionally, blood donations were turned down for anyone who appeared to be ill or undernourished. If the possible donor was under the age of 18, under 50 kg, anemic, or otherwise appeared unwell or undernourished, if they had a history of jaundice, malaria, asthma, or HBV, HCV, or HIV infection. All samples that didn't fulfil the specified standards were disqualified from blood donations. Blood-borne infection sufferers with a recent history were also prohibited from donating. A sterile test tube was used to collect the blood, and 5 ml of each sample was centrifuged for 5 minutes at 3500 rpm to separate the serum. Within 24 hours following the collection, tests were conducted. ICT kits were used for screening for HBsAg, anti-HIV, and anti-HCV (Healgen Scientific LLC, China). With the enzyme-linked immune sorbent assay (ELISA), all seropositive samples were retested for confirmation. Examining both thick and thin blood smears allowed researchers to identify the malarial parasite, and following thorough quality control, all serological testing was conducted. Microsoft Excel was used to process and display the data that had been collected.

## RESULTS

A total of 1500 donors (male= 1404, female=96) were screened for the prevalence of TTIs. Out of 1500 donors, 163 (10.9%) donors were positive and 1337 (89.1%) were negative. Prevalence of HCV was most prevalent 7% (n=106), followed by HBV 2.8% (n=42), Syphilis 0.7% (n=11), malaria 0.2% (n=3), and HIV 0.06% (n=1)(Table 1).

**Table 1:** Detail of positive and negative samples

| Variables | Category | Frequency (%) |
|---|---|---|
| Gender | Female | 96 (6.4%) |
| | Male | 1404 (93.4%) |
| Negative cases | Total | 1500 (100%) |
| | - | 1337 (89.1%) |
| Positive cases | HCV | 106 (7%) |
| | HBV | 42 (2.8%) |
| | Syphilis | 11 (0.7%) |
| | Malaria | 3 (0.2%) |
| | HIV | 1 (0.06%) |
| | Total | 163 (10.9%) |

Out of positive donors, prevalence of HCV, HBV, Syphilis, malaria, and HIV was 65%, 26%, 7%, 2%, and 0.6% (Figure 1).

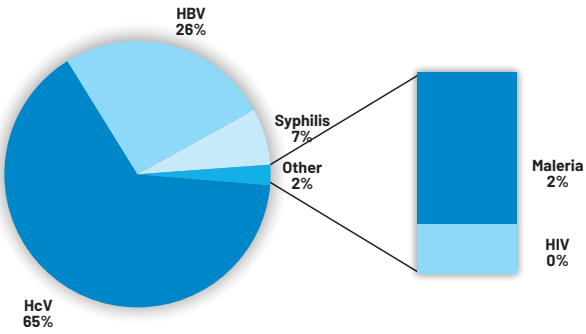


**Figure 2:** Distribution of TTIs in infected donors

Donors between the ages of 20 and 55 were chosen at random while keeping in mind the standard requirements for blood donation. The current study did not select and include donors whose ages were not within the selection criteria. The highest % of donors were reported between the age group of 25 to 40 years and lesser with reported at a minimum and maximum age of selection criteria. The

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sample gender distribution of donors demonstrated that men made up the majority. Three anti-HCV antibodies and only two HBsAg positive female donors were found. For syphilis, malaria, and AIDS, no females tested positive.

## DISCUSSION

Transfusions of unsafe blood are extremely costly, both monetarily and in terms of human lives. TTIs infections affect recipients, families, and communities for the long term since the sick person is a virus reservoir and can propagate the disease [8]. Hepatitis B, C, D, and G viruses, HIV, CMV, human T lymphotropic virus (HTLV I and II), *Treponema pallidum, Brucella species, Toxoplasma gondii, Plasmodium* species, and *Trypanosoma cruzi* are among the pathogens that can spread through transfusion [6]. A screened donor's donation of blood and blood products can lessen the chance of TTIs [9]. In our study, ICT kits were used to screen all donated blood for the presence of HBsAg, HIV Ag/Ab, and anti-HCV Ab, and ICT is the most widely used test in diagnostic laboratories around the world for making quick decisions regarding patient diagnosis and care. Hepatitis was the most prevalent TTI among the donors at the district Faisalabad blood transfusion centers. In 106 donors (7%), anti-HCV antibodies were discovered. In a systematic review in 2020 researchers showed a cumulative frequency of HCV 2.44% (ranging 1.57% to 8.34%), in 26 studies conducted all over Pakistan, among 17660 blood donors. HCV prevalence was <2% in 8 studies, 2–4% in 15 studies, and >4% in 3 studies [10]. Previously in 2019, 3.24% HCV prevalence was reported in Faisalabad at Madinah Teaching Hospital [11]. Our study showed that prevalence of HCV is increasing among blood donors of this locality. For the HBV antigen, 42 blood donors (2.8%) had positive results as compared to another study in which load of HBV in donors was 1.12% in Faisalabad [11]. While all over the Pakistan the 2.04% cumulative prevalence of HBV ranging from 0.81% to 4.22%, was reported in 24 studies among 16230 blood donors, in which 20 studies had HBV prevalence <2% while 4 studies showed >2% [10]. Worldwide over 350 million of the 2 billion people with HBV infection are suffering from a chronic infection, which is characterized by the persistence of the virus and HBsAg in the blood as well as the generation of viral antigens and HBV DNA in the liver. A million people every year pass away from chronic liver disease linked to HBV. 15 to 40% of those with persistent HBV infection develop cirrhosis, liver disease, or hepatocellular carcinoma (HCC). Infected people have HBV in their blood, saliva, semen, vaginal secretions, and menstrual blood [12]. During the infection's window period, a carrier person can spread HBV without being noticed [13]. Nucleic acid testing (NAT) may be utilized to identify such carriers when the amount of detectable HBsAg is insufficient. Because of NAT testing of blood and blood products as well as pre-transfusion screening, the prevalence of TTI infection has significantly decreased in the US and Europe [14]. Using the VDRL, 11 (0.7%) cases of syphilis were verified, which was low as compared to previously reported value of 1.10% in Faisalabad [11]. In 2020 researchers reported a cumulative frequency of 1.1% in 6974 blood donors, in which seven studies reported <1%, six studies between 1% and 2%, and four studies reported >2% syphilis prevalence [10]. Each year, almost 1 million women with active syphilis give birth. Without treatment, 25% of them will give birth to a stillborn child and 33% will have a baby that is underweight and has a higher risk of dying within the first month of life. By screening pregnant women and giving those who test positive a single dosage of penicillin before 28 weeks' gestation, adverse pregnancy outcomes caused by syphilis can be avoided [15]. Three donors (0.2%) who had minor fever symptoms were discovered to have *plasmodium* during temperature monitoring. Previously, a review article reported cumulative 0.11% material frequency ranged from 0.005% to 1.2% in Pakistan in 368 donors. All research showed <1% prevalence of malaria except one study conducted by Ehsan *et al.*, (1.20%)[10]. One of the deadliest infectious diseases to affect humans—presents challenges in both clinical and economic terms. The mosquito is typically the insect vector that spreads *Plasmodium* species across vertebrate hosts [16]. In 1911, the first case of malaria associated with transfusion was reported [17]. Malaria is growing prevalent in underdeveloped nations, notably Africa, with approximately 300 million cases and 100 million fatalities annually [18]. In our study only a single case (0.06%) was reported of HIV, while 0.18% prevalence was reported previously in healthy donors of Faisalabad [11]. Ehsan *et al.*, reported 0.038% of cumulative HIV prevalence ranged between 0% and 0.18% in 497 blood donors based on 18 studies in Pakistan [10]. According to a study by Agha Khan University, transfusion-associated HIV prevalence ranged from 0.013 percent to 0.116% [19]. The viremia in a given population, the sensitivity of screening tests like ELISA done on blood donors, the stage of blood transfusion including the preantibody phase of infection, and the quantity of blood bags being transfused to the recipient could all be significant factors in transmission [20]. The average incubation period and time to produce measurable antibody levels, according to various research, is almost eight weeks. Due to the low likelihood of antibody detections during that stage, there is a higher risk of HIV transmission from blood transfusions [21]. The interval between the commencement of the illness and viremia may be five years [22]. Prior to blood transfusion, screening techniques have reduced the annual incidence

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of TTIs from 4000 to 100. The majority of TTIs currently occurs during pre-antibody screening and transfusion. NAT may aid in the safe transfusion of blood prior to the establishment of a detectable quantity of antibody when ELISA is inadequate [23]. Pakistan is at a high risk for transmittable infectious illnesses due to its underdeveloped status. According to a recent WHO study, there are currently 2 billion, 200 million, and 33.4 million HBV, HCV, and HIV infections, respectively, making the complete eradication of risk factors linked to TTIs still unattainable. Between 97,000 and 125,000 people in Pakistan contract HIV. In Pakistan, 3 million pints of blood are donated each year, and there is a 1% possibility of developing TTIs (transfusion-related illnesses). Many healthy individuals carry these infectious agents, which can be reduced by enabling effective TTIs agent pre-screening [24]. When antibody testing techniques fail to detect pathogens in blood components, NAT testing has improved the sensitivity of pathogen detections during window or incubation periods of the pathogen.

## CONCLUSIONS

It was concluded that 10.9% blood donors who look healthy had some type of TTIs, especially hepatitis, and had potential to transmit TTIs more commonly. It is mandatory to improve the procedure and sequence of events involved in the order of selection of blood donors so that the spread of TTIs can be controlled, maintaining increased recipient safety.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Role of Helicobacter Pylori Infection and Nonsteroidal Anti-Inflammatory Drug Use in Bleeding Peptic Ulcers

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## ABSTRACT

Most peptic ulcers and their complications are caused by Helicobacter pylori and nonsteroidal anti-inflammatory drugs (NSAIDs). **Objective:** To characterize the bleeding peptic ulcers features. **Methods:** This prospective study was carried out on 124 cases in the Department of Gastroenterology, Lady Reading Hospital in collaboration with Pharmacology Unit of Khyber Medical University, Peshawar from July 2018 to June 2020. All the patients were categorized into four groups: Positive H. pylori and no NSAID history (Group I), Positive H. pylori and NSAID use (Group-II), Negative H. pylori and NSAID user (Group-III), and Negative H. pylori and no NSAID history (Group-IV). Data analysis was carried out in SPSS version 26. **Results:** Of the total 124 cases, the prevalence of positive and negative H. pylori infection was 77.4% (n=96) and 22.6% (n=28) respectively. The number of patients in group I, II, III, and IV patients were 80 (64.5%), 16 (12.9%), 17 (13.7%), and 11 (8.9%) respectively. The incidence of NSAID users were 33 (26.6%) patients, out of which 18 used on daily basis and 15 on demand. Those in groups I and IV were substantially younger than groups II and III and they had less comorbid disorders than patients in group I. **Conclusion:** The present study concluded that about 26.6% of patients with bleeding ulcers took NSAIDs, meaning that low-dose aspirin will cause bleeding ulcers as will NSAID use on-demand.

## INTRODUCTION

Helicobacter pylori and nonsteroidal anti-inflammatory medication (NSAID) are the most major risk factors in the pathophysiology of peptic ulcer disease and ulcer bleeding [1]. Those infected with H. pylori have a slightly higher risk of peptic ulcer bleeding, while patients using NSAIDs have an approximately fivefold greater risk [2]. A previous study investigated the bleeding peptic ulcer patients taking NSAIDs to compare with matched control and found that H. pylori infections was reported in 16% patients of bleeding peptic ulcer with NSAIDs users. Another study reported that the incidence of H. pylori negative ulcers was 8.8% [3]. Numerous investigations reported that peptic ulcers patients who are infected with H pylori and who are being treated with NSAIDs are more likely to develop H pylori negative ulcers [4, 5]. Non-bleeding ulcers have been shown to be less likely to be infected by H pylori than bleeding ulcers [6, 7]. Researchers studying Helicobacter pylori and nonsteroidal anti-inflammatory medications (NSAIDs) in the context of peptic ulcer disease have reached conflicting conclusions regarding their potential

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roles in the etiology of peptic ulcer disease [8, 9]. However, in multiple epidemiological studies of NSAID-treated individuals, H pylori infection reduced the frequency of peptic ulcer illness compared to those without it [10]. Randomized controlled clinical trials have also yielded conflicting results, studies that examine the eradicating effect of the H. Pylori infection and NSAID users on ulcer healing and their risk of developing peptic ulcers [11]. The incidence of negative H. pylori infectious ulcers is limited in the absence of NSAID use [12].

## METHODS

This prospective study was carried out on 124 cases in the Department of Gastroenterology, Lady Reading Hospital in collaboration with Pharmacology Unit of Khyber Medical University, Peshawar from July 2018 to June 2020. All the patients were categorized into four groups: Positive H. pylori and no NSAID history (Group I), Positive H. pylori and NSAID use (Group-II), Negative H. pylori and NSAID user (Group-III), and Negative H. pylori and no NSAID history (Group-IV) as shown in table 1. WHO software for sample size calculation was used by taking 95% confidence interval, 5% margin of error, and prevalence of H pylori infection and NSAID use in patients with peptic-ulcer bleeding 8.8% [3]. The sample size was 124. Patients with a history of H pylori eradication and an antibiotic or anti-ulcer drug had been taken in the past 3-4 weeks or a gastric surgery history were excluded. Hemodynamically unstable patient undergone through upper endoscopy for hemocliping and pure ethanol injection in order to stop active bleeding. Follow-up endoscopy was performed 48 hours after emergency endoscopy and hemostasis was confirmed. A rapid urease test was used for the confirmation of H. pylori and those with negative H. pylori underwent 13C-urea breath test 1 day after endoscopy during follow-up. Patient's members were thoroughly questioned about their NSAID usage. Daily usage of NSAIDs was defined as consistent ingestion during a 4-week period. Informed consent was obtained before phospholipid determination. The prevalence of non-NSAID ulcers and non- H. Pylori infection was matched to the prevalence of H. pylori and NSAID-related ulcers. A comparison was made for comorbid illnesses and ulcer locations of the individuals. Both the serology and 13C-urea breath tests are used to assess H pylori status. If either test is positive, the patient is considered positive for H pylori. Smoking was assessed through interviews as a potential confounding factor. Statistical analyses (SPSS version 26.0) was used for data analysis. We compared the incidence of ulcers caused by H pylori or NSAIDs with those not caused by H pylori or NSAIDs. The coexisting diseases of the patients and the location of the ulcers were compared. Analysis of variances or the $\chi$-squared test were used as statistical methods. P <0.05 was considered statistically significant.

| Categories | NSAIDs and H. Pylori status |
|---|---|
| Group-I | Positive H. pylori and no NSAID history |
| Group-II | Positive H. pylori and NSAID user |
| Group-III | Negative H. pylori and NSAID user |
| Group-IV | Negative H. pylori and no NSAID history |

**Table 1:** Patients categorization in different groups

## RESULTS

Of the total 124 cases, the prevalence of positive and negative H. pylori infection was 77.4% (n=96) and 22.6% (n=28) respectively. The frequency of patients in different groups I, II, III, and IV patients were 80 (64.5%), 16 (12.9%), 17 (13.7%), and 11 (8.9%) respectively. The incidence of NSAID users were 33 (26.6%) patients, out of which 18 used on daily basis and 15 on demand. Those in groups I and IV were substantially younger than groups II and III and they had less comorbid disorders than patients in group I. Endoscopic examination indicated atrophic changes in 9 individuals in Group IV, indicating a previous H. pylori infection, and these atrophic alterations continued during bleeding. The number of patients in different groups are shown in Table 2.

| Groups | N (%) |
|---|---|
| I | 80 (64.5%) |
| II | 16 (12.9%) |
| III | 17 (13.7%) |
| IV | 11 (8.9%) |
| Total | 124 (100%) |

**Table 2:** Patient's distribution in different groups

Majority of the patients in Group IV had significant co-morbidities. The incidence of positive and negative H. pylori is depicted in Figure 1.

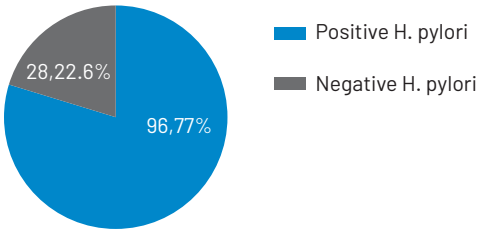


**Figure 1:** Incidence of Positive and Negative H. Pylori

Infection with Helicobacter Pylori and use of nonsteroidal anti-inflammatory drugs (NSAIDs) in patients are compared in Table 3.

| Parameters | Group-I | Group-II | Group-III | Group-IV |
|---|---|---|---|---|
| N (%) | 80 (64.5) | 16 (12.9) | 17 (13.7) | 11 (8.9) |
| Mean age (yrs.) | 56.4 ± 1.7 | 64.4 ± 3.6* | 62.4 ± 4.4* | 52.8 ± 3.9 |
| Gender (M/F) | 58/22 | 14/2 | 5/12* | 9/2 |
| Daily NSAIDs | – | 11 | 7 | – |
| On-Demand NSAIDs | – | 4 | 7 | – |
| Comorbidity N (%) | 19 (23.8) | 14 (87.5)** | 15 (88.3)** | 6 (54.5)** |
| Malignancy N | 8 | 6 | 4 | 7 |
| Mortality | 2 | 0 | 3 | 0 |

**Table 3:** Helicobacter Pylori Infection comparison with

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nonsteroidal anti-inflammatory drugs(NSAIDs)users
*Statistically significant compared with group A or group D, P < 0.05
**Statistically significant compared with group A, P<0.05
Gastric antral mucosa (µg/mg) phospholipid concentrations in Table 4.

| Variables | Control | Group-I | Group-III | Group-IV |
|---|---|---|---|---|
| Number | 30 | 24 | 12 | 10 |
| Phosphatidylcholine (PC) | 5.14 ± 0.38 | 3.38 ± 0.4 | 3.10 ± 0.37 | 3.81 ± 0.28 |
| Phosphatidylethanolamine (PE) | 3.18 ± 0.31 | 2.02 ± 0.26 | 1.97 ± 0.31 | 2.21 ± 0.21 |
| Sphingomyelin (SM) | 0.41 ± 0.09 | 0.39 ± 0.07 | 0.41 ± 0.07 | 0.44 ± 0.12 |

**Table 4:** Gastric antral mucosa (µg/mg) phospholipid concentrations

## DISCUSSION

The present study mainly focused on the contribution of the non-inflammatory steroid and Helicobacter pylori infection in peptic ulcer bleeding cases and reported that H pylori-infected NSAID users are about twice as likely as non-infected NSAID users to suffer bleeding ulcers. NSAIDs were used by about 26.6% of patients with bleeding ulcers, suggesting that both low-dose aspirin and NSAID usage on-demand will produce bleeding ulcers. NSAIDs uses and H. pylori infection are the most common causes of peptic ulcers. Numerous studies have found that NSAID users with H. pylori-negative peptic ulcers varied from 2% to 11% [13, 14]. H. pylori was found to be negative in 11% of stomach ulcers and 6% of duodenal ulcers in USA patients [15]. The incidence of H. pylori-negative peptic ulcers in the Malaysia States was 11% [16], whereas others reported 4.4% and 1.3%, respectively [17, 18]. Previous research has indicated that rising risk of H. pylori infection increases the peptic ulcer disease by three to four times [19]. In the five controlled investigations, no peptic ulcer disease was detected in patients with non- H pylori infection and NSAIDs non-users [20-22]. As a result, this is the real control sample for assessing any probable connection between NSAID usage and H pylori infection for the peptic-ulcer illness development. A matched control cases were compared with NSAIDs users H. pylori infected patients and found that sensitive analysis validated the magnitude of risk representing the peptic ulcer disease development indicated by synergism between risk factors. It has been proposed that bleeding ulcers are less likely to be associated with infectious H. pylori [23]. NSAID usage is the promising variable related to negative ulcer's bleeding with H. pylori [24]. According to the previous study conducted in Europe that approximately 4.1% cases had peptic bleeding ulcer with H. pylori and non-NASAIDs user [25]. Gastric atrophy is commonly related with H. pylori infection [26]. Duodenal ulcers were more prevalent in Group I and comorbid illness was the lowest as compared to others groups. These characteristics are common in H. pylori-related ulcers [27]. NSAIDs user displayed comparable features in groups II and III. Their average age was substantially older than that of group I or group II. Although duodenal ulcers were uncommon in groups II and III, the majority of patients in both groups had some concomitant illness. Based on the hydrophobicity, the gastric mucosa phospholipids play a vital part in the gastroduodenal epithelium's protective barrier function [28]. Previous research has revealed that H. pylori infection reduces phospholipid concentrations in the stomach mucosa [29, 30]. A previous investigation discovered that the stomach mucosa related phospholipid concentration reduced in H. pylori infection patients [30].

## CONCLUSIONS

It has been concluded that H. pylori-infected NSAID users are almost twice as likely to develop bleeding ulcers as non-infected NSAID users. About 26.6% of patients with bleeding ulcers took NSAIDs, meaning that low-dose aspirin will cause bleeding ulcers as will NSAID use on-demand.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Satisfaction of Nursing Students Toward Their Clinical Placement and Association with Their Academic Year at Private Nursing College Karachi Pakistan

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## ABSTRACT

Clinical placement is the setting of the physical environment and personnel teaching for healthcare workers, including nurses and nursing students. A clinical placement offers hands-on learning opportunities that can enhance your understanding of healthcare practices and procedures. Moreover, clinical placement could also provide networking opportunities and connections with healthcare professionals, which could help build their professional network. **Objective**: To measure the satisfaction of nursing students toward their clinical placement and association with their academic year at private Nursing College Karachi Pakistan. **Methods**: A cross-sectional analytical study was conducted in the Horizon School of Nursing and Health Sciences Karachi, Pakistan, from June 2022-September 2022. A total of 62 participants were part of the study; 3rd year and 4th-year students were enrolled. Moreover, a Convenient sampling technique was used for the data collection. Data were collected through a valid and reliable tool that was self-administered**. Results:** The study results show that. 12.9% of participants had a low level of satisfaction regarding their clinical placement, 51.6.% had a moderate level, and 35.5% had a high level of satisfaction. There was no significant difference between the satisfaction of nursing students toward their clinical placement with their academic year p-value (.193). **Conclusions**: Most students were satisfied with their clinical environment. But some still have poor satisfaction; it is essential to listen to nursing students' feedback regarding their clinical placement and take steps to address their concerns.

## INTRODUCTION

Clinical placement is the setting of a physical environment in which students apply their theoretical knowledge to clinical practice [1]. The development of pleasant clinical placement depends on the interactions between staff and students [2]. Additionally, clinical placement provides an opportunity to gain valuable experience in a professional healthcare setting, which could be beneficial for future career prospects [3]. Besides this, creating a proper clinical environment for nursing students could enhance their learning experience, providing them with hands-on training in a realistic setting [4]. Furthermore, it has been demonstrated that the learning of the clinical placement directly affects nursing students' perception that their profession promotes a professional foundation. Along with this, during their clinical education, nursing students' learning, critical thinking, decision-making, self-monitoring abilities, and academic motivation are crucial [5]. Positive clinical placement experiences increase nursing students' capacity for critical analysis and problem-solving, foster a deep sense of belonging, boost self-assurance, and advance nursing professionalism [6]. Proper clinical placement for nursing students should provide a safe, diverse, and supportive learning environment that prepares them for the challenges and rewards of nursing practice. Moreover, placement-based and student-related factors both had a significant impact on clinical learning experiences. The student's learning experience during the clinical placement can be improved

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by the preclinical orientation of nursing students, the distribution of students in different groups, and the clarification of learning objectives before the clinical placement [7]. In addition, improper assessment in clinical placement and other factors have all been found to impact nurses' performance negatively [8]. Moreover, exposure to negative clinical placement nursing students could be emotionally draining, negatively impact their well-being and learning, and can compromise patient care. Adversely, an unsatisfactory clinical placement experience can cause frustration, which delays the progression of nursing training from a school setting to a hospital environment [9]. Moreover, the study revealed a few gaps, including filling up the psycho-social needs of students, the need for more space for relaxation in the clinical area, & acknowledging the challenging nature of their job along with the regular monitoring of the supervisor [10]. Nursing students may be satisfied if they feel like they are being exposed to a diverse range of healthcare settings, patient populations, and nursing specialties. To foster a positive learning environment, clinical placement coordinators can work with healthcare facilities to ensure that students are offered a variety of clinical experiences that align with their learning goals and objectives. Additionally, higher learning and healthcare institutions must work together to create a supportive environment for clinical learning [11]. Being satisfied with your clinical placement could provide an opportunity to learn and gain valuable experience, which is essential for the development of the nursing student. Measuring nursing students' satisfaction could help identify areas of improvement in the nursing program and ultimately improve the quality of education provided to students [12]. Therefore, assessing student satisfaction regarding their clinical placement is necessary to fulfill their needs. So, this study aims to find out the satisfaction among nursing students toward their clinical placement and association with their academic year at private Nursing College Karachi Pakistan.

## METHODS

A cross-sectional analytical design was used at the horizon school of Nursing and Health Science from June 2022-September 2022. A total of 62 students were recruited through a convenient sampling technique. Both the 3$^{rd}$ year & 4$^{th}$ year students were part of this study. The sample size was calculated through open EPI with a 95% confidence interval. With a total population of 82, the sample size was 68, but six participants did not fill out the questionnaire, so the data were collected from 62 students. The tool was designed with the help of literature [13], which is used for the data collection consisting of two components sociodemographic data consisting of seven questions like gender, study year, last clinical placement, clinical hospital, and interaction with the nursing instructor. Another component is the Likert scale, which is about the satisfaction of clinical placement. The tool has a total of 125 scores, which were converted to 100%. Those participants who scored below 75 were considered a low level of satisfaction, 75-100 were considered a moderate level, and those above 100 marked a high level of satisfaction. Four clinical experts review the tool, and the suggestions are incorporated. The Cronbach alpha is calculated on 10 % of the population; the value is 0.9. Written permission was taken from the Horizon School of Nursing and Health Science management. Additionally, a consent form was given to each study participant before data collection. Confidentiality and anonymity were maintained. The returned questionnaire and checklists were stored in a locked cabinet. To maintain human rights and dignity. The researcher provided information about the purpose of the research study to the participants. Data were analyzed through SPSS version 26.0. Frequency and percentage calculated of the demographic variable and overall satisfaction levels. The Chi-square test has been applied to the association of satisfaction with their academic year.

## RESULTS

Table 1 revealed that 62 participants were enrolled in the study 88.7% were male, and 11.7% were female. Furthermore, of 3rd-year and 4th-year students enrolled in the study, 82.3% were from the 3rd year and 17.7% from the 4th year. The last clinical placement of the students was geriatric, Surgical, medical, and other wards. 3.2% of participants were working in the geriatric, 17.7% were working in the surgical, 66.1% were working in the medical, and 13% were working in the other hospital department. Moreover, 14.5% of participants responded that we couldn't evaluate changes in clinical placement, 62.9% responded that changes occur in our clinical placement, and 22% responded that no changes occur in our clinical placement. Furthermore, 46.8% of participants worked in the general hospital, 19 % in the Specialized care center, 8.1% in the outpatient department, and 14.5% in another department. Moreover, 4.8% of participants responded that they never interacted with the clinical instructor during clinical, 21% responded that they interacted with the clinical instructor 1-2 times during clinical, and 46 74.2% responded that they interacted as per needed with the clinical instructor.

**Table 1**: Demographic characteristics of the participants

| Variable | Frequency (%) |
|---|---|
| **Gender** | |
| Male | 55 (88.7) |
| Female | 7 (11.3) |
| **Year of Study** | |
| 3rd year | 51 (82.3) |
| 4th year | 11 (17.7) |

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| Type of nursing ward of last clinical placement | |
|---|---|
| Geriatric | 2 (3.2) |
| Surgical | 11 (17.7) |
| Medical | 41 (66.1) |
| Other | 8 (13) |
| **Did any changes take place during your placement?** | |
| I cannot evaluate | 9 (14.5) |
| Yes | 39 (62.9) |
| No | 14 (22.6) |
| **Category of the hospital where the clinical placement took place** | |
| General Hospital | 29 (46.8) |
| Specialized care center | 19 (30.6)5 |
| Outpatient department | (8.1) |
| Others | 9 (14.5) |
| **During the most recent clinical placement, how many times did you interact with the clinical instructor?** | |
| Never | 3 (4.8) |
| 1-2 times | 13 (21.0) |
| As per need | 46 (74.2) |

Table 2 shows the overall result of satisfaction. The total number of participants was n=62, and the total score was 125. And 12.9% of participants scored below 75 and had a low level of satisfaction regarding their clinical placement; 51.6% scored 75-100 and a moderate level, and 35.5% scored more than 100 and had high satisfaction.

**Table 2:** Levels of satisfaction

| Participants percentage | Obtained score / total score 125 | Level of Satisfaction |
|---|---|---|
| 12.9% | Below 75 | Low Level |
| 51.6% | 75 to100 | Moderate Level |
| 35.5% | Above 100-125 | High Level |

Table 3 shows that from 3r d year, 9.8% had a low level of satisfaction, 51.0% had moderate, and 39.2% had a high level of satisfaction regarding their clinical placement. Also, from the 4th year, 27.3% had low satisfaction, 54.5% moderate, and 18.2% had high satisfaction regarding their clinical placement. And the p-value is 0.193, which shows no significant difference between the satisfaction of nursing students toward their clinical placement with their academic year.

**Table 3:** Total Satisfaction Level Association with Academic Year

| Total Satisfaction Level Association with Academic Year | | | | | |
|---|---|---|---|---|---|
| Year Of Study | Total Satisfaction Level | | | Total | p-value |
| | Low | Moderate | High | | |
| | Frequency (%) | | | | |
| 3rd Year | 5 (9.8) | 26 (51.0) | 20 (39.2) | 51 | .193 |
| 4th Year | 3 (27.3) | 6 (54.5) | 2(18.2) | 11 | |
| Total | 8 (12.9) | 32 (51.6) | 22 (35.5) | 62 | |

The Chi-square test has been applied.
p-value<0.05 taken as significant
Table 4 also shows the association of satisfaction with the academic year. The mean score of the 3rd year is 92.3922, and 4th year is 84.2727, and the p-value is 0.171. It shows no significant difference between the academic year and satisfaction.

**Table 4:** Satisfaction Level Association with Academic Year

| Year | Mean | p-value |
|---|---|---|
| 3rdYear | 92.3922 | 0.171 |
| 4th Year | 84.2727 | |

Independent T-test has been applied
p-value<0.05 taken as significant

## DISCUSSION

The clinical learning environment is crucial in helping students meet their learning objectives. A supportive clinical learning environment is necessary to transfer their knowledge to clinical practice. Clinical experience teaches students how to conduct physical examinations, communicate with patients, their families, and staff, give drugs, among other necessary tasks, foster critical thinking, and create nursing care plans [12]. The present study aims to assess the satisfaction among nursing students toward their clinical placement and association with their academic year at private Nursing College Karachi, Pakistan. The present study result showed that 2.3% of the participant's last clinical placement was geriatric, 17.7% was surgical, 66% was medical and 12.9% were in another unit. Likewise, a study result showed that in the last clinical placement of the participants, 4% were from geriatric, 17.5% from surgical, 19.0% from medical, and 39.7% were from another department [13]. Moreover, the present study result showed that 51.6% had a moderate level of satisfaction regarding their clinical placement, and 35.5% had a high level of satisfaction. Similarly, another study result aligns with the present study. This study result showed that the participants felt that the hospitals provide favorable learning in the clinical area; that's why the high level of satisfaction and high level of intention to stay and work there were identified. Furthermore, the positive relationship between clinical learning, supervisors, and participant satisfaction was identified. Satisfaction is essential; it can lead to developing motivation in the students [14]. In this regard, another study also found the same result, demonstrating that the clinical placement experience was largely positive [15]. Moreover, favorable Clinical placement increases nursing students' capacity for critical analysis and problem-solving, fosters a deep sense of belonging, boosts self-assurance, and advances nursing professionalism and identity [16]. Another study result supports that most students were moderately satisfied with their clinical environment [17]. Furthermore, nursing students' clinical learning placement has significantly improved in recent years. Still, some face difficulties, including the lack of attention from seniors, lack of students' teaching and learning strategies, powerless

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feelings in the clinical area, and not open new approaches in routine nursing care. Even in high-income countries, these lacking were also found by numerous studies [13]. Current findings revealed that 12.9% of participants still have low satisfaction. A study result is almost similar and found that 9% of the nursing students had low satisfaction regarding their clinical placement [18]. Low satisfaction from the clinical placement can lead to fear and anxiety and disturb the students' learning [19]. The objectives of the service and educational sectors can be combined in a setting that promotes cooperative learning, mutual respect, and trust among nursing students. Nursing students may become dissatisfied if not exposed to various healthcare settings, patient populations, and nursing specialties. To address this issue, clinical placement coordinators can work with healthcare facilities to ensure that students are offered diverse clinical experiences. The present study found that 74% of the participants responded that they communicate with the clinical instructor when needed. The study findings almost similar to this finding demonstrated that 68% of the participants communicate with the instructor during clinical [13]. This shows that the clinical instructor is cooperative with the students. The current study found no significant difference between satisfaction level and year of academia. The study findings agree with other study stated that there is no association between the level of satisfaction with their academic year [20]. In contrast, another study found a different result that shows a significant difference with the academic year [21]. Moreover, the assistance and expertise of clinical instructors play a role in students' happiness in their clinical setting [22]. Furthermore, nursing student attribution is influenced by clinical experience, satisfaction, and different nursing instructor in the different academic years. Nursing instructors must evaluate students' comfort with their clinical experience to improve educational performance [23].

## CONCLUSIONS

The study result identified that most participants were satisfied with their clinical placement. The students demonstrated greater satisfaction with their surroundings and the educational process in those placement hospitals where they thought there was a good clinical learning environment and sufficient supervision. But some students still have poor satisfaction. It is essential to listen to nursing students' feedback regarding their clinical placement and take steps to address their concerns. By working closely with healthcare facilities and preceptors, clinical placement coordinators can create a positive and supportive learning environment that helps nursing students to develop into competent and confident nurses.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Spontaneous Resolution of 'Glue Ear' in Children- An Experience at A Tertiary Care Teaching Hospital of Khyber Pakhtunkhwa

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## ABSTRACT

Otitis media with effusion (OME) is a common cause of treatable hearing impairment in children. As OME is a recurrent problem, a 'wait and see' policy is therefore worthwhile before embarking on treating it surgically. **Objective:** To determine the frequency of cases having spontaneous resolution of otitis media with effusion in the first 3 months after acquiring the disease. **Methods:** This study was conducted in ENT Department of Hayatabad Medical complex, Peshawar during the period from July 1, 2021 to Sep 3, 2022. Children aging 3-13 years diagnosed with recent onset OME were followed upto 3 months. Children were categorized into two categories; "Resolved" and "Persistent OME" on the basis of pure tone audiometry and tympanometry at the end of 3 months. Using this data, the frequency of spontaneous resolution of otitis media with effusion (glue ear) was calculated. **Results:** A total of 185 patients were included in the study. The male: female ratio was of 1.28: 1 with mean age of 7.71 ± 2.75years. The 6-9 years comprised 88(47.57%) & was the commonest age group involved by OME and it was in the same group where maximum percentage of spontaneous resolutions of disease occurred. Overall 148(80%) of children with glue ear achieved spontaneous resolution. Statistically this number has been highly significant (p=0.001). **Conclusion:** OME resolves spontaneously in a significant proportion of children in first 3 months of illness. A close follow up is recommended before embarking on surgery which is best reserved for persisting cases.

## INTRODUCTION

Otitis media is a term referring to inflammation of the middle ear cleft without referring to the possible aetiology. Otitis media with effusion (OME) is the accumulation of sterile fluid, serous or mucoid, in the middle ear cleft and sometimes the mastoid air cell system. Otitis media with effusion (OME) is common in the paediatric age group and is associated with delay in language &speech acquisition in early childhood. These children perform poorly at school and are prone to develop behavioral problems in later life [1, 2]. OME is extremely common in children 1-7 years old with a point prevalence of 20% and a period prevalence of 80% in the under 5 year age group. Risk factors for developing of OME are passive smoking, bottle feeding, atopy, enlarged adenoids and eustachian tube dysfunction. Most of the cases resolve on their own [3, 4]. OME is the most frequent cause of hearing loss in children. Approximately 80% of all children will have had a single episode of OME before the age of 3 years and 40% will have three or more episodes [5]. Children with OME may have difficulty in communicating, show inattention or have poor performance at school. As otitis media with effusion is a treatable cause of hearing deficit, therefore, close observation is necessary. Otitis media with effusion does not always require treatment because spontaneous improvement occurs in 78% to 88% of the ears. As the outcome of OME is favorable and intervention may carry adverse effects, an observation period of 3 months is advisable in children who are not at risk of speech and learning problems. OME has a resolution rate of 26% by 6 months and 33% by 1 year [6]. Treatment is required in those in whom spontaneous resolution of OME

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fails or hearing impairment is debilitating. William Wilde (1815-1878) first described otitis media with effusion. Recognizing its association with eustachian tube dysfunction, he advised tympanocentesis [7]. The study aims to determine the frequency of children with OME who resolved spontaneously in a period of 3 months and, therefore, to emphasize the need for close observation. A watchful period of 'wait & see' is likely to avert inadvertent surgeries while not putting the patients at risk of developing complications.

## METHODS

This prospective, cross sectional and observational study was conducted at the ENT Department of Medical Teaching Institution, Hayatabad Medical complex, Peshawar from July 1, 2021 to September 30, 2022. It includes 185 patients fulfilling the inclusion and exclusion criteria. The sample size was calculated assuming 15% prevalence of otitis media with effusion in the local child population with 95% confidence interval and a 5% margin of error using Calculator.net software for sample size calculation. The samples were collected using the non-probability convenient sampling technique. Ethical approval was sought from the institutional ethical review board. Patients were included in the study after taking informed consent from the parents and guardians. Children aged 3 to 13 years with recent onset of symptoms of OME no longer than 2 weeks and having evidence of hearing impairment either clinically or on audiological testing with at least 30dB hearing loss on pure tone audiometry or loss of stapedial reflex(es) & Type B curve on tympanometry were enrolled in the study. Those with sensorineural hearing loss, post head & neck radiation, cleft palate, Down's syndrome and suppurative otitis media were excluded from the study. All the hearing impaired children visiting ENT ward, OPD and institutional based private practice were included in the study. Detailed history was obtained from parents regarding respiratory tract infections, earache, nasal obstruction, nasal discharge, sleep disturbances, inattention at home and school, delayed speech, sore throats and hoarseness of voice. A thorough clinical ENT examination was made. Speech defects, Down's syndrome & congenital anomalies were looked for. Otoscopy was carried out to look for the status of tympanic membrane noting its color, cone of light, retraction pockets and presence of bubbles in middle ear. Conversational voice test was carried with examiner's lips covered. Tuning fork tests were carried out where appropriate. Children with history of nasal obstruction were advised plain X-ray lateral view of the nasopharynx to look for enlarged adenoids. Those with clinical suspicion of hearing loss were advised PTA and tympanogram. Conductive hearing loss in the range of 30-40 dB over the speech frequency range 500 Hz, 1000 Hz, 2000 Hz and 3000 Hz combined with flat type B tympanogram was considered as evidence of OME. In those in whom PTA was not possible, flat type B tympanogram with absence of stapedial reflex at 100 dBHL was considered as ample proof of OME. Symptomatic treatment including broad spectrum antibiotics and analgesics not exceeding 7 days was given only when necessary. A follow up PTA and tympanogram with or without stapedial reflex, as appropriate, were acquired after 3 months and comparison made with initial clinical and audiological findings. An improvement in hearing thresholds over the speech frequency range of >10dB and a discernible peak in curve between -100dapa to +50 dapa were considered as the signs of recovery. A return of stapedial reflex at < 100 dBHL was also considered as sign of recovery. For the purpose of analysis, the outcome of tympanogram at 3 months was considered as the single decisive factor. The patients thus were grouped either as "Resolved" or having "Persistent OME". Children with Bilateral OME with single ear recovery were also assigned to "Persistent OME". The information obtained was recorded on a proforma. The percentage of spontaneous resolution of OME was calculated. Descriptive statistics for variables like gender, age were analyzed to determine the frequencies. Cross tables were used to find out the observed relationships of gender and ages of the patient with OME. Chi-square test was performed and p-value determined to determine the significance of the observed rate of spontaneous resolution of OME specific to gender& age. The data were analyzed using SPSS version 26.0 for windows. p-value <0.05 was considered significant.

## RESULTS

A total of 185 patients were included in the study. The male: female ratio was of 1.28: 1. The age range of the patient was 3-13 years with mean age of 7.71 ± 2.747years. All the children enrolled had hearing loss as their primary complaint. The clinical features at the time of presentation are shown in Table 1.

| Clinical features | | 3-5 years | 6-9 years | 10-13 years |
|---|---|---|---|---|
| Hearing Loss | | 48 (25.95%) | 88(47.57%) | 49(26.49%) |
| Nasal Discharge | | 21(11.35%) | 23 (12.43%) | 13 (7.03%) |
| URTI | | 12 (6.49%) | 15 (8.11%) | 3 (1.62%) |
| Nasal Obstruction | | 38(20.54%) | 53 (28.65%) | 16 (8.65%) |
| Inattention | | 30 (16.22%) | 36 (19.46%) | 18 (9.73%) |
| Otoscopic Findings | Bubbles | 3 (1.62%) | 6 (3.24%) | 3 (1.62%) |
| | Distorted Cone of Light | 45 (24.32%) | 82 (44.32%) | 46 (24.86%) |

**Table 1:** Clinical Features in Patients suggestive of Otitis Media with Effusion (n=185)

The 6-9 years age group has maximum number 88 (47.57%)

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of patients followed by the 10-13 years age group which had 49(26.47%) of patients. Spontaneous resolution took place more frequently in females 66(81.5%) than in males. However statistically this finding is not significant (p=.0673). The detail is shown in Table 2.

| Gender | Resolved | Persistent OME | Total | p-value |
|---|---|---|---|---|
| Male | 82 (78.8%) | 22 (21.2%) | 104(56.23%) | 0.79 |
| Female | 66 (81.5%) | 15 (16.2) | 81(43.77%) | |
| Total | 148(80%) | 37(20%) | 185(100%) | |

**Table 2:** Gender of Children and The Outcome of OME (n=185)

The 6-9 years comprised 88 (47.57%) & was the commonest age group involved by otitis media with effusion. It was in the same group where maximum number 79(90%) of effusions resolved spontaneously. Chi square test and p-value show that the number of effusions that resolved spontaneously in the various age groups is highly significant (p=00001). The detail of spontaneous resolution of otitis media with effusion with respect to the various age groups has been shown in Table 3.

| Age range | Resolved | Persistent OME | Total | p-value |
|---|---|---|---|---|
| 3-5 years | 26(54.2%) | 22 (9.60) | 48(26%) | .00001 |
| 6-9 years | 79(90%) | 9 (17.60) | 88(47.57%) | |
| 10-13 years | 43 (87.76%) | 6 (9.80) | 49(26.5%) | |
| Total | 148(80%) | 37(20%) | 185(100%) | |

**Table 3:** Age Groups of Children and The Outcome of OME (n=185)

Overall a total of 148 (80%) middle ear effusions underwent spontaneous resolution. The outcome of otitis media with effusion at the end of 3 months follow up has been depicted in Table 4.

| Outcome | N (%) |
|---|---|
| Resolved | 148 (80%) |
| Persistent OME | 37 (20%) |
| Total | 185 (100%) |

**Table 4:** The Overall Outcome of OME At The End of 3 Months

## DISCUSSION

Otitis media with effusion (OME) is a common cause of treatable hearing impairment in the pre-school and school age. Keeping in mind the behavioral, learning and speech deficits it causes, prompt treatment is required. The treatment is both conservative and surgical [8]. As the exact etiology is not known therefore a variety of antibiotics, decongestants and antihistamines are tried. These drugs are not without serious side effects especially when administered over a prolonged period of time. Surgery is aimed at improving eustachian function and restoring middle ear ventilation but the decision when to operate has always been difficult in wake of the high rate of spontaneous resolution. As OME recurs several times in pre-school and school age, a watchful observation seems to be an acceptable policy [9-11]. We studied 185 patients in which 26% were in 3-5 years, 47.5% in 6-9 years and 26% in the 10-13 years age groups in comparison to Hogan et al who found a lesser prevalence of otitis media with effusion in the higher age groups i-e 15% for 8-13 years age groups. However, our findings are similar to Williamson et al who found that 5-8 years was the most common age group involved by OME [12, 13]. In 2016 study conducted at this center, OME was commonest in the age group 6-8 years 58.7% of the ears affected by OME [14]. In a similar study conducted by Buckley and colleagues in 207 ears diagnosed with OME. They reported a spontaneous resolution rate of 96.4% at 9 months after diagnosis. They carried out myringotomies for the presence of fluid in the middle ear space at 0-3, 3-6 & 6-9 months and found a highly significant proportion of spontaneous resolution of otitis media with effusion in those who have waited longer for myringotomy [15]. Jack L Paradise & colleagues randomly assigned 429 children with persistent middle ear effusion before 3 years to tympanostomy group or observed upto 9 months. They found no significant difference in the outcome between the two groups. They concluded that in children upto 3 years of age prompt insertion of ventilation tubes do not measurably improve the developmental outcomes irrespective of whether otitis media with effusion has been continuous or discontinuous & unilateral or bilateral [16]. Sohail Ahmad & colleagues conducted a study in Abbottabad, Pakistan involving 40 children with secretory otitis media and treated them with antibiotics, mucolytics, decongestants and antihistamines. They followed the patients and performed audiological assessment at 2 and 4 weeks and observed complete recovery in 26(65%) of patients. In sharp contrast to this study, However, we did not use any medications for resolution of effusion in our study. Moreover our observations were more encouraging [17]. In yet another study conducted at Abbottabad by Yusaf and colleagues found that 71.5% of the 112 ears with effusion resolved completely with conservative management when followed for 36 months. They used intranasal corticosteroid sprays in addition to antibiotics and decongestants [18]. Lowri Edwards & colleagues studied 389 children aged 2-8 years with bilateral otitis media with effusion. They concluded that less severe baseline hearing loss most consistently predicted acceptable hearing levels at 5 week, 6 months and 12 months. Spontaneous recovery of otitis media with effusion in patients with negative history of allergies and male gender were significant at 6 months but not at 12 months. Duration of symptoms was significant predictor of spontaneous recovery at 5 weeks but not at 6 months and 12 months [19]. The persistence and severity of symptoms in otitis media with effusion is attributed to the super infection of middle ear fluid by bacterial pathogens. Korona-Gloviniak and colleagues studied risk factors for

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bacterial aetiology in in middle ear effusions of 50 children aged 2-8 years having otitis media with effusion. Using culture and PCR for identification of 4 bacteria including Streptococcus pneumonia, Haemophilus influenzae, Moraxella catarrhailis and Alloiococcus otiditis, they found that 37 (74%) of the middle ear effusions contained at least one of the aforementioned bacteria. At least one third of effusions had multiple pathogens. The Alloiococcus otiditis was the commonest pathogen in 30(44.1%) of middle ear effusions. They concluded that bacterial invasion of middle effusion played a significant role in severity of symptoms and persistence of disease [20]. The present study highlighted an important entity that is responsible for hearing impairment in children. Hearing impairment in children has a bearing on the developmental outcomes such as social behavior, learning and speech acquisition.

## CONCLUSIONS

Otitis media with effusion resolves spontaneously in a significant proportion of children in the first 3 months of illness. A close follow up is, therefore, recommended before embarking on surgery. Surgery should only be reserved for those persisting beyond this period to avoid the sequelae of otitis media with effusion in the affected children.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Frequency of Anxiety and Depression among Medical Students During Viva Exam

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## ABSTRACT

Examinations are an integral part of medical school education and negative emotional states affect the memory, recalling and timely response of the students during the examination. **Objective:** To find out the frequency of anxiety and depression among medical students at the time of taking the viva examination. **Methods:** A cross-sectional study was conducted on medical students at the Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University Islamabad, Pakistan. For data collection, Beck Anxiety Inventory and Beck Depression Inventory questionnaires were used. A total of 207 participants were included via inclusion criteria. Inclusion criteria were medical students of age 18-25 years, both males and females having viva examination at the time of data collection. Those students who were already diagnosed with psychological issues were excluded from the study. For the analysis of data SPSS version 21.0 was used. **Results:** 207 students participated in this research. The majority of the students 115 (56.6%) have mild anxiety levels whereas 103 (49.8%) students were having normal ups and downs that were not considered as depression. 45 (21.7%) students have mild mood disturbance. **Conclusions:** This study concluded that medical students face a mild level of anxiety and mood disturbance during viva exams.

## INTRODUCTION

According to World Health Organization (WHO) reports mental health of students is considered an important public health concern globally [1]. Medical education is challenging and has considerable effects on the physical and intellectual health of medical students [2, 3]. A higher prevalence of psychiatric disorders including anxiety and depression was reported in multiple studies [4]. Gender-based comparison of symptoms associated with anxiety and depression in medical students showed diverse findings, ranging from no difference to high prevalence in females. Comparisons of depressive and anxiety symptoms by gender among medical students yielded mixed findings, showing either no difference or high prevalence among females [5, 6]. Students of medical may feel stress when academic demands exceed their abilities to deal with [7] and studies show that they suffer from high perceived stress in comparison to the general population and students of other pedagogical domains [8, 9]. In Pakistan, anxiety and depression were found to be present in 70% of medical students [2]. Various stressors have been identified to cause impairment in mental health of medical students, including excessive workload, poor sleep, financial issues, peer pressure to score good grades and pressure of career choices [10]. Three important

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factors that trigger anxiety in medical students are examinations, extensive course content and not enough time for revision [11]. Students experience psychological distress, especially during the examination that showed against failure or the impact of that failure on their self-esteem [12]. The prevalence of examination related anxiety and psychological distress among medical students was found to be 25% to 56% [13]. These psychological problems during examination lead to poor academic performance, professional incompetency and poor wellbeing of medical students [14]. Current study aimed to investigate the frequency of anxiety and depression in medical students during exams which has a great impact on students' performance, their results and overall grading.

## METHODS

A cross-sectional study was carried on medical students having viva exams. It was 6 months duration study starting from January 2019 to June 2019. The study was conducted at the Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University Islamabad, Pakistan. The sample size was 207 participants. The non-probability convenient sampling technique was used. The participants were recruited in the study on the basis of pre-determined inclusion and exclusion criteria i.e. the students (both males and females) having age range 18-24 years, having exams were included in the study. Whereas students with diagnosed psychological problems were excluded from the study. The selected participants were given a consent form before being recruited in the study. After their consent to participate in the study, Self-structured questionnaire was provided and the participants were asked to answer all the questions. Valid and reliable tools were used: such as Beck Anxiety Inventory (BAI) [15] to assess the level of anxiety experienced by the individuals before going for Viva Exams and the Beck Depression Inventory (BDI) [16] to assess the level of Depression in medical students. BAI raw scores ranging from 0 to 63The BAI scores are divided into four categories: minimum anxiety (0–7), mild (8–15), moderate (16–25) while severe (30-63) [17]. The BDI scores are translated as, score of 1 to 10: These fluctuations are regarded as normal.11 to 16 points equals a mild mood disorder, grade of 17 to 20: clinically borderline depression, 21 to 30 indicate moderate depression, 31 to 40 represents severe depression, score of 40 or higher: Extreme depression [18]. After having the participant's response, the data were then analyzed using the SPSS version 21.0.

## RESULTS

The mean age of the participants was 20.84 ± 2.50 (years). Majority of the students were female 56(82.4%), majority 48% students attended all their lectures. Majority 44% students covered all their course. Majority 36% students have revised their course only once. Majority 48% students find that particular subject interesting. Majority 52% students memorizing method was by reading. Majority 57% students preferred method of preparation was group study. Majority 29% students' pervious grade in that particular subject was above 75%. According to Beck's anxiety inventory scale majority 115 (56.6%) of the students have mild anxiety followed by moderate and severe levels. Among those students who have mild level of anxiety, 27% were those who have attended all the lectures. 20 % with mild level of anxiety were those who had revised the lectures only once. The anxiety level was more prevalent (30%) in those students who found that subject interesting. Those who revised all of their courses only once (29%) and those who revised two times (23%) also had mild level of anxiety. Those who preferred their memorizing method by writing (7%) had mild level of anxiety as compared to those who used reading method (30%). Similarly, those who preferred group study (31%) have mild level of anxiety as compared to those who preferred self-study (19%) (Figure 1).

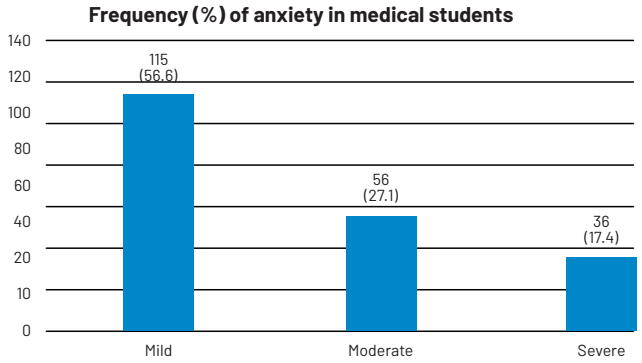


**Figure 1:** Frequency (%) of anxiety in medical students

According to Beck's depression inventory scale majority 103 (49.8%) students were normal and do not have depression at all and 45 (21.7%) have mild mood disturbance whereas very few participants reported severe and extreme level of depression (Figure 2).

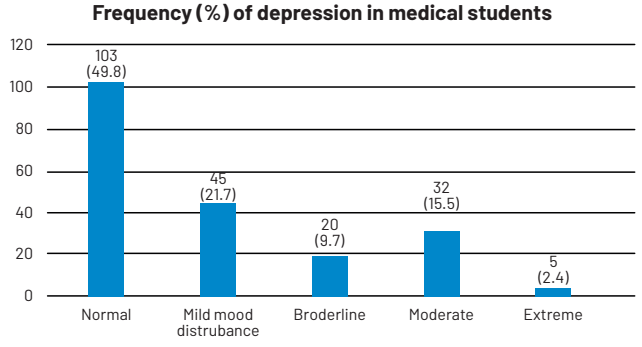


**Figure 2:** Frequency (%) of depression among medical students

## DISCUSSION

Examinations are fundamental part of medical schooling

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and serve various purposes such as screening of students. When students fail in exam, they normally reappear in exam; although, frequent failures lead to time delays and eventually elimination from medical school. As a consequence, examinations are observed quite stressful and anxiety-inducing part of medical education [19]. During the training period of medical students their emotional status has been a point of concern, reported as early as 1956 [20]. Because of increasing reports on depression in medical students during their academic years, we were focused, whether Viva exam is really the cause of anxiety and depression among medical students or not. It's observed in many studies that medical students are greatly affected by stress [21]. Beside this, results of some research show minor to no evidence of stress in medical students [8, 9]. In the current study mild level of anxiety was reported in majority of the students during viva exam and maximum number of students were normal with respect to depression symptoms. Study conducted in 2018 by Hamzah et. al showed similar results, where stress and anxiety was reported by the students during viva exams whereas, no depressive symptoms were observed in students [22]. According to Guraya *et al.*, study results examiner based assessment including viva exams induce more anxiety among students then other modes of assessment [11]. Another study by Hussain *et al.*, results were in accordance with the current study where medical students reported negative emotions including stress and anxiety during examination [23]. In comparison of our study, a systematic review and meta-analysis published in JAMA Network Open found that the pooled prevalence of depression among medical students was 27.2%, while the pooled prevalence of anxiety was 33.8%. The study also found that the prevalence of anxiety and depression was higher among medical students than among the general population [24]. The results of our study showed that 27.1% of the students have moderate levels of anxiety. Studies have found that the prevalence of anxiety and depression among medical students can vary widely, depending on the population studied, the tools used for assessment, and the timing of the assessment. However, research suggests that the prevalence of anxiety and depression among medical students can range from 20% to 50% [25].

## CONCLUSIONS

The study concluded that majority of the medical students experience mild anxiety taking viva exams while the majority of the students don't experience depression but mild mood disturbances during the exam. Further studies should find the effectiveness of different techniques to reduce anxiety during exams to enhance memory and recall of the students taking exams.

## Conflicts of Interest

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Original Article

# Computed Tomography in Diagnosis of Lesions of Pulmonary Tuberculosis

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## ABSTRACT

Pulmonary tuberculosis (MTB) is dangerous bacterial infection primarily affecting lungs and is capable of infecting everyone exposed to *Mycobacterium tuberculosis*. AFB and CXR are useful preliminary investigative tools, but CT scan are invaluable diagnostic tool for establishing a diagnosis and monitoring disease activity. **Objectives:** To diagnose the lesions of PTB and assess the CT scan findings in AFB-positive patients. **Methods:** The AFB-positive patients were examined using CT scan to reveal their mediastinal and pulmonary pathological conditions and activities and disease propagation using imaging technology of CT scan. In cases of PTB with lymphadenopathy, 50cc of non-ionic contrast was administered intravenously to examine the low attenuation area. **Results:** The findings of CT scan regarding micronodules, nodular masses and other foci and lymphadenopathy were scrutinized, and major diagnostic CT scan findings were Centrilobular nodules (97.40%), Parenchymal nodules (84.43%), Paratracheal and mediastinal lymphadenopathy (74.85%), air space consolidation and paucity (62.07%), Pulmonary calcification (31.73%), Pleural effusion (29.34%) and Bronchiectasis (12.77%). **Conclusions:** CT scan is the most sensitive and accurate tool for diagnosis confirmation and disease activity evaluation. In addition, it details the abnormalities and prognosis of organ deformity in PTB patients.

## INTRODUCTION

Tuberculosis is a prevalent health public concern with significant casualties and morbidity rates. Active TB risk is influenced by immunological state, immunosuppressive medication, malnutrition, malignancy, extreme age, end-stage renal disease, diabetes mellitus and HIV infection [1]. Societal factors like poor life quality, unhygiene, overcrowding, malnutrition, lack of literacy, big families, early marriage and lack of wakefulness contribute to prevalence of tuberculosis [2]. Pulmonary tuberculosis (PTB) is caused by exposure to *Mycobacterium bacilli* for the first time. Its primary location in lungs reflect the area of highest ventilation; of which common sites are central or inferior lobe, or frontal part of greater lobe, with mediastinal lymphadenopathy. Such lesions manifest a calcified nodule (Ghon lesion) and heal spontaneously. As the lesions advance, pleural effusion, acute cavitation, tuberculous empyema and mediastinal lymphadenopathy develop too [3, 4]. Early diagnosis is vital for efficient treatment of PTB. But imaging is one of the most important diagnostic tests for it. Computed tomography (CT) is more sensitive than chest X-Ray at detecting microscopic solid TB processes of AFB-positive PTB in comparison to AFB-negative patients [5-7]. CT scan is the preferred approach for detecting early bronchogenic spread in secondary TB and is extra sensitive than CXR for disease activity assessment. The usual CT findings during actively propagating disease were deformed nodules, consolidation, tree-in-bud pattern, cavitation and ground glass opacities [3, 8]. Chest radiography persisted being the most important imaging tool for diagnosing PTB but

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plain CXR had 34% accuracy in diagnosing PTB and 59% of patients with post-primary PTB. While CT scan has been reported to be more sensitive than CXR in detecting minor exudative lesions, mild or concealed parenchymal deformities and disease activity. It is more sensitive in detecting miliary nodules, correlating underlying pathomorphological processes, and sequential morphological and structural deformities [9, 10]. Therefore, this study was performed to diagnose the lesions of PTB and assess CT scan findings in patients diagnosed with PTB.

## METHODS

Current study was cross-sectional research conducted in the Pulmonology Centers of Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan from September 2021 to November 2022. The study comprised 501 patients, of all peripheral areas of the district of different age and sex groups, who were found positive for PTB through AFB techniques and chest X-Ray radiographs, during the study period. The sample size was calculated using the following equation:

$$n = Z^2 x P(1-P)/ d^2$$

where, Z = 1.96 (constant), P = expected prevalence and d= absolute precision of 5% or 0.05. Only AFB-positive (on sputum or endobronchial washings smear or culture), and fresh cases of PTB were included. AFB-positive PTB cases in any retreatment group, and patients with Chronic Obstructive Airways Disease (COPD) and pneumoconiosis were excluded. All recruited patients were advised to abstain from oral consumption for at least two hours before operation. CT scan of the chest of all study patients was performed using a Toshiba Asteion Multi 4 Slice scanner in the recommended protocol. Both mediastinal (window width 250-400 Hounsfield units; window length -10 to 50 and lung (window width 1000; window length 700 HU) windows were used to image the scans. In cases of PTB with lymphadenopathy, 50cc of intravenous non-ionic contrast was administered manually as a bolus dose to examine low attenuation area [9]. The findings of CT scan regarding micronodules, nodular masses and other foci and lymphadenopathy, *etc* were examined properly and structurally analyzed. The research was granted ethical approval by Institutional Panel of Review Committee and the informed patients' consent and agreement were ensured. All the ethical norms especially patient confidentiality were in strict compliance with ethical codes. Data were processed using SPSS version-24.0 and demographic as well as descriptive data were statistically analyzed. Descriptive analysis was conducted. Quantitative variables were described in percentages and frequencies and the CT scan findings of PTB patient's variables were also presented.

## RESULTS

The research was conducted in District Dera Ismail Khan, Khyber Pakhtunkhwa from September 2021 to November 2022, comprising 501 patients who were found positive for PTB through AFB techniques and CXR. The demographic features of the study population revealed that most of patients belonged to age group of over 50 years (51.49%), followed by 30-50 years of age (37.62%) and less than 30 10.77%. Most of them were females (55.48%), while 44.51% were males. A significantly high proportion of the study population ($p<0.05$) was uneducated (66.26%) and 33.73% were educated (169/501). Most of the PTB patients ($p<0.05$) belonged to the urban areas (68.27%) followed by the rural population (31.73%) (Table 1).

**Table 1:** Demographic features of AFB-positive individuals

| Demographic feature | Frequency (%) |
|---|---|
| **Age (Years)** | |
| <30 | 54(10.77) |
| 30-50 | 189(37.72) |
| >50 | 258(51.49) |
| **Sex** | |
| Male | 223(44.51) |
| Female | 278(55.48) |
| **Education** | |
| Educated | 169(33.73) |
| Uneducated | 332(66.26) |
| **Locale** | |
| Rural | 159(31.73) |
| Urban | 342(68.27) |

Figure 1 showed the clinical sign of pulmonary Tuberculosis in participants with AFB-positive.

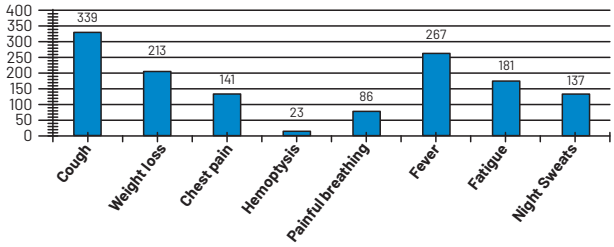


**Figure 1:** Clinical signs of PTB of the study patients

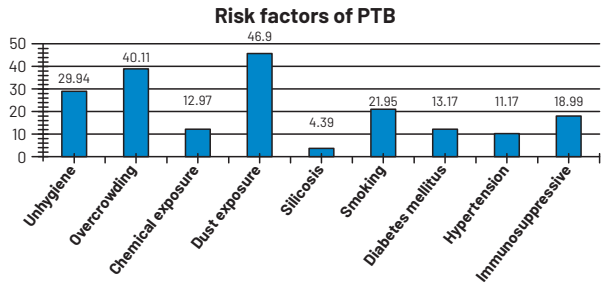


**Figure 2:** Frequency of risk factors associated with PTB in the study population

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The clinical features of the affected patients were also critically analyzed, and it was found that the major clinical signs were coughing (67.66%), followed by fever and pyrexia (53.29%), severe reduction of patients' weight (42.51%), fatigue (36.12%), chest pain (28.14%), night sweats (27.34%), painful breathing (17.16%) and hemoptysis (4.59%) (Figure 1). Figure 2 depicted the frequency (%) of risk factors associated with PTB in the study population and it was discovered that chief risk factors were dust exposure (46.90%), overcrowding (40.11%), unhygienic conditions (29.94%), smoking (21.95%), immunosuppressive disorders (18.99%), diabetes mellitus (13.17%), exposure to chemicals (12.97%), hypertension (11.17%), and silicosis (4.39%), *etc.* The AFB-positive patients were subjected to CT scan analysis, and it was found that the major diagnostic CT-scan findings of PTB patients were Centrilobular nodules (97.40%), Parenchymal nodules (84.43%), Paratracheal and mediastinal lymphadenopathy (74.85%), Air space consolidation and paucity (62.07%), Pulmonary calcification (31.73%), Pleural effusion (29.34%) and Bronchiectasis(12.77%)(Table 2).

**Table 2:** CT scan findings of PTB patients for diagnostic purposes

| Lesion | No. of patients exhibited | Patients not exhibited |
|---|---|---|
| Paratracheal and mediastinal lymphadenopathy | 375 | 126 |
| Air space consolidation | 311 | 190 |
| Parenchymal nodules | 423 | 78 |
| Pulmonary calcification | 159 | 342 |
| Bronchiectasis | 64 | 437 |
| Pleural effusion | 147 | 354 |
| Centrilobular nodules | 488 | 13 |

## DISCUSSION

In this study, factors that influenced severe lesions were scrutinized from perspectives of medical history and laboratory examination, on the basis of categorization values from mild to moderate of PTB individuals employing CT scan, in which the independent risk factors distressing stern lesions were effectively screened out and combined score was developed, provided that a reasonable, hasty and relatively expedient modus operandi for predicting the severity of lesions. Our findings revealed that major diagnostic CT-scan findings of PTB patients were centrilobular nodules, parenchymal nodules, paratracheal and mediastinal lymphadenopathy, air space consolidation and paucity, pulmonary calcification, pleural effusion and bronchiectasis. Our findings were consistent with the study revealing that substantial intrapulmonary lesions accounted for 61.56% of PTB cases [11], and were comparable to the findings of a research that 72.22% (206/285) of patients exhibited severe lung lesions via CT scanning and were predominantly cavity-type lesions, while 56.31% had predominantly thick-walled cavity lesions [12]. Other studies like Murthy *et al.*, and Carlesi *et al.*, reported that sputum-positive PTB bear a strong correlation with cavities, while the thick wall contained fiber tissue, caseous necrotic substance, inflammatory granulation tissue and wall thickness was certainly interrelated with sputum bacterial stack [13-15]. It was reported that CT was far more sensitive than CXR in detecting both localized and disseminated PTB infections and mediastinal lymphadenopathy [16]. It differentiated between active and inactive ailments. 80 and 89% of patients with active and inactive PTB were distinguished by chest CT [17, 18]. Another similar nature retrospective research analyzed that PTB was detected in 49.7%. males and 42%, were females. PTB was characterized by chronic productive cough, weight loss, squatness of breath, chest ache, fever and hemoptysis among other signs. The classic clinical manifestations of PTB were persistent cough, anorexia, sputum production, fever, night sweats, hemoptysis and weight loss 3. Such manifestations were also seen in our research. Our study was in close liaison with the findings that lung consolidations were observed in 70% of cases of PTB cases, while cavities were radiological signature of TB reactivation in 20-40% of cases. Miliary TB is also present in 2-6% of cases of primary TB [19]. Bronchiectasis developed in 30-60% of patients with active and 71-85% in inactive PTB in HRCT [20]. In Nachiappan *et al.*, study pneumothorax was seen in 5% of post-primary cases, which is a little higher than our 4.5% estimate [21]. Destruction of bone or costal cartilage and rim enlargement of accompanying soft tissue masses indicate chest wall involvement. TB spondylitis typically affects the lower thoracic and upper lumbar regions of the spine, manifesting as end plate erosions, sclerosis, and limited disc space with paravertebral abscesses.

## CONCLUSIONS

Pulmonary tuberculosis is highly contagious, which negatively impacted the quality of life and health of individuals of underdeveloped nations such as Pakistan. Despite major advancements in detection and treatment, tuberculosis vestige one of the leading infectious sources of illness and mortality globally. AFB and CXR are useful first investigative tools, but CT-scan is an invaluable diagnostic tool for establishing a diagnosis and monitoring disease activity. In clinically suspected situations where CXR findings are ambiguous, CT scan is strongly suggested for diagnosis confirmation and disease activity evaluation. In addition, it details the abnormalities and prognosis of organ deformity PTB.

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## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Association Between the Marital Status and Work-Related Quality of Life Among in Health Care Workers

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## ABSTRACT

Marital status is one of the main Indicator of stress which affects the occupational tasks of healthcare workers in Pakistan. **Objective:** To find out the relationship among marital status, PSS and WRQoL due to which the occupational tasks in HCWs suffer. **Methods:** This study was an observational type of cross-sectional survey. 50 HCWs were include between the age of 20-40 who had no comorbid conditions. After taking approval from ERC of RIHS the study was conducted at Rawal Institute of Health Sciences and Holy family Hospital, Rawalpindi from June 2022 to Jan 30, 2023. Two groups were formulated on the basis of marital status of participants. Single HCWs were included in Group A (n=19) whereas married in group B (n=31). Man, Whitney U test for between groups analysis was carried out to find the relationship among marital status, PSS and WRQoL. Level of significance was <0.05 and CI=95%. **Results:** Mean and Standard deviation of age in group A was 29.53±7.28 and in group B it was 30.39±6.09. Man, Whitney U test showed insignificant difference (p>0.05) between PSS and marital status but there was a significant difference (p<0.05) on WRQoL on the basis of marital status. **Conclusions:** It was concluded that married HCWs had low QoL as compared to single workers. But level of stress was also high in married workers on the basis of percentages.

## INTRODUCTION

Health care workers have always borne critical stressful incidents during their job in pursuit of their professional excellence [1]. Due to competitive environment of their workplace their stress level is always higher as compared to other professions [2,3]. Personal, professional as well as professional wellbeing of health care workers affects the quality of life due to prolonged stress which affects their performance level [4-6]. Such circumstances create the status of extra burnout which is a vital concern for such professionals. Marital status is one of the crucial components that also affects the occupational tasks of these individuals [7, 8]. This status quo determines their work efficiency of work. Responsibilities in term of family care, financial management and work affects their level of stress and makes them a unique subgroup of individuals [9]. These health care workers are considered as a "role model" in our society which heightens their responsibility due to which their personal as well as psychological health is ignored [10, 11]. Therefore, less attention is given to their personal and mental health. There is very scarce data available in literature about such conditions. Occupational tasks execution vary with respect to type of work and stress level are two streams in health care workers that can be predicted [12, 13]. Level of academic as well as clinical dedication, leisure time, workload pressure along with research have been the main areas of analysis by researchers in healthcare workers [14]. Marital status as one of stressful indicator in healthcare professionals had

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been ignored from the very first day as a cause of stress [15]. This along with gender difference remained controversial with respect to perception of stress in health professionals. [16, 17]. How the quality of life and stress is kept on heightening in these workers have not been investigated so far. The main objective of this study was to observe the effect of marital status on occupational tasks of health care workers in term of their quality of life and stress level. No single study has investigated the perceived level of stress among health care workers which affect their occupational tasks. Study results of this study will help to understand the social status of their married or single life and will help to support these workers in coping or management of their stress and how to support them in improving their quality of life.

## METHODS

This was an observational type of study. After getting approval from Ethical Review Committee of RIHS, it was conducted at Rawal Institute of Health Sciences, Islamabad and Holy family Hospital Rawalpindi from June 2022 to January 30, 2023. Duration of this study was of seven months. Participants were informed about the purpose of this study and their written informed consent was taken. They were taken into confidence that their identity will be concealed, and no breach of confidentiality will be done in this study. Participants between 20-40 years of age were included who had no co-morbidity of any kind. Those individuals who had any kind of mental health issues or comorbidity were excluded from study. Sample size was calculated by WHO calculator which was 50. On the basis of inclusion criteria two groups were formulated on the basis of their marital status of participants. Group A was named to those who were single whereas married participants were included in group B. These individuals were given the WRQoL (Work related quality of life) Questionnaire which contain 23 items in it. WRQoL is polymetric scale with six sub-scale items in it e.g., general well-being (GWB), Home-work interface (HWI), Job and work Satisfaction (JWS ), Control at work (CAW), Working conditions (WCS) and Stress at work (SAW) and Perceived Stress Scale which contain 10 items in it. Both of these scales are measure on five score Likert Scale. Data were analyzed by the use of SPSS version 21.0. Normality of data was checked by Shapiro Wilk test. As $p<0.05$ which revealed our data was non normally distributed. Therefore, we employed nonparametric test for between single and married individuals to compare the effects of their marital status on PSS and WRQoL. Demographic data were depicted in the form of frequency and test mean and Standard deviation was used for descriptive statistics. Mann was done between marital status and quality of like and perceived stress scale (PSS) to measure the association between marital status and these variables. The level of significance in this study was set as $p<0.05$ and confidence interval (CI) 95%.

## RESULTS

There were 8(42.1%) were individuals between age group of 20-25 and 09(29.1%) were of married in group A and B respectively. Between age group of 26-30, 31-35 and 36-40 the frequency (%) of single participants were 01(5.3), 04(21.1) and 06(31.5%) whereas in married participants it was 05(16.5%), 09(28.8%) and 08(25.6% in each group respectively. Mean and Standard deviation of age in group A was 29.53 ± 7.28 and in group B it was 30.39 ± 6.09. Only 09(47.4%) were males in in group A and in group B it was13(41.9%). The frequency and percentages of occupation in both groups are depicted in table 1.

**Table 1:** Demographic data

| Variables | Group A Frequency (%) | Group B Frequency (%) |
|---|---|---|
| **Age** | | |
| 20-25 | 8(42.1) | 09(29.1) |
| 26-30 | 01(5.3) | 5(16.5) |
| 31-35 | 04(21.1) | 09(28.8) |
| 36-40 | 06(31.5) | 08(25.6) |
| Mean ± SD | 29.53 ± 7.28 | 30.39 ± 6.09 |
| **Gender** | | |
| Male | 09(47.4) | 13(41.9) |
| Female | 10(52.6) | 18(58.1) |
| **Occupation** | | |
| Doctors | 04(21.1) | 02(6.5) |
| Nurses | 10(52.6) | 11(35.5) |
| Physiotherapist | 02(10.5) | 09(29) |
| OT Assistant | 02(10.5) | 026.5) |
| Pharmacist | 015.3) | 07(22.6) |

The frequency (%) of perceived stress scale in group A who had low stress level was 06(21.5), at moderate level it was 1062.6) and at high level of stress was 03(15.9). whereas in group B the level of stress at low, moderate and high level was 08(25.6), 1855.2) and 6(19.2%) respectively. WRQOL sub-groups frequency in group A and B are depicted in table 1. Mean ± SD of single individuals in perceived stress scale was 18.74±8.35 whereas in group B it was 19.06 ± 6.95. work related quality of life and in its sub-variables the Mean ± SD was 21.05 ± 4.06 and 16.06 ± 4.64 in GWB in group A and B respectively. Whereas in Mean ± SD HWI, JWS, CAW, WCS, SAW and Overall Score of WRQOL in group A 9.32 ± 2.03, 20.74 ± 3.80, 9.79 ± 1.65, 8.95 ± 2.44, 4.79 ± 1.51 and 74.63 ± 12.41 respectively. In group B the Mean ± SD of these variables was 16.06 ± 4.64, 8.32 ± 2.18, 16.71 ± 5.18, 9.03 ± 2.37, 8.71 ± 2.73, 4.87 ± 1.95 and 63.71 ± 14.74 (Table 2).

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**Table 2:** Descriptive Statistics

| Variables | | Mild | Moderate | Severe | Mean ± SD | p-value |
|---|---|---|---|---|---|---|
| PSS | Group A | 06(21.5) | 10(62.6) | 03(15.9) | 18.74 ± 8.35 | 0.70 |
| | Group B | 08(25.6) | 18(55.2) | 06(19.2) | 19.06 ± 6.95 | |
| **WRQoL** | | **Low** | **Average** | **High** | **Mean ± SD** | **p-value** |
| GWB | Group A | 09(47.4) | 01(5.2) | 09(47.4) | 21.05 ± 4.06 | 0.00 |
| | Group B | 27(87) | 02(6.5) | 02(6.5) | 16.06 ± 4.64 | |
| HWI | Group A | 07(36.9) | 11(57.9) | 01(5.2) | 9.32 ± 2.03 | 0.11 |
| | Group B | 18(58.4) | 13(41.6) | ––– | 8.32 ± 2.18 | |
| JWS | Group A | 05(26.2) | 09(47.1) | 05(26.2) | 20.74 ± 3.80 | 0.01 |
| | Group B | 18(58.4) | 11(35.1) | 02(6.5) | 16.71 ± 5.18 | |
| CAW | Group A | 06(31.7) | 11(57.9) | 02(10.4) | 9.79 ± 1.65 | 0.25 |
| | Group B | 16(51.2) | 14(45.6) | 01(3.2) | 9.03 ± 2.37 | |
| WCS | Group A | 14(73.7) | 04(21.1) | 0.1(5.2) | 8.95 ± 2.44 | 0.80 |
| | Group B | 24(77.2) | 05(16) | 02(6.5) | 8.71 ± 2.73 | |
| SAW | Group A | 08(42) | 04(21.1) | 07(36.9) | 4.79 ± 1.51 | 0.91 |
| | Group B | 12(39.2) | 10(32) | 09(28.8) | 4.87 ± 1.95 | |
| Total Score | Group A | 07(37.1) | 07(37.1) | 05(25.8) | 74.63 ± 12.41 | 0.00* |
| | Group B | 24(77.2) | 06(19.6) | 01(3.2) | 63.71 ± 14.74 | |

The Mean Rank (MR) of PSS in group A was 24.63 whereas in Group B it was 26.03. WRQOL subgroup GWD, HWI, JCS, CAW, WCS, SAW and total score mean rank was 34.05, 29.58, 32.21, 28.50, 25.82, 25.79 and 32.84 in group A with $p>0.05$ in all subgroups except GWD and total score of WRQOL ($p<0.05$) which revealed that marital status affects the quality of life of married individuals and those who are married has low quality of life as compared to single individuals. But level of stress in both groups is same as $p>0.05$ which showed insignificant difference between both groups (Table 3).

**Table 3:** Association between marital Status and PSS and WRQoL

| Variables | Mean Rank | | p-value |
|---|---|---|---|
| | Group A (Single) | Group B (Married) | |
| PSS | 24.63 | 26.03 | 0.74 |
| **Age** | | | |
| GWD | 34.05 | 20.26 | 0.001 |
| HWI | 29.58 | 23.00 | 0.11 |
| JCS | 32.21 | 21.39 | 0.01 |
| CAW | 28.50 | 23.66 | 0.24 |
| WCS | 25.82 | 25.31 | 0.90 |
| SAW | 25.79 | 25.32 | 0.91 |
| Total Score WRQOL | 32.84 | 21.00 | 0.005 |

## DISCUSSION

This study was conducted to observe the relation of marital status and its impact on the Perceived Stress Scale and work- related Quality of Life of health care workers. It was observed that those participants who were single had mild level of stress were 06(21.5%) whereas in mild and high PSS their frequency was 10(62.6%) and 03(15.9%) respectively. This showed that more than half of individuals were in mild level of stress as compared to high- or low-level PSS. When PSS score were compared with group B participants who were married individuals had 0.8(25.6%) in mild level, 18(55.5) in moderate stress level and 06(19.2%) in severe stress. In married individuals the severe stress level (19.2%) was high as compared to single (15.9%) individuals. Whereas moderate level of stress was greater in single individuals (62.6%) as compared to married (55.5%) healthcare workers. This demonstrated that those healthcare workers who are married has higher susceptibility of severe stress as compared to single healthcare workers. Work related quality of life (QoL) in healthcare workers showed that single HCWs had higher quality of life as compared to the married HCWs. When GWB (general well-being) which is sub-scale of WRQOL was assessed in single HCWs it was revealed that out of 19 total workers 09(47.4%) of workers the QoL was low, 01(5.2%) had average QoL and 09(47.4%) whereas in married HCWs 27(87%) had low QoL score, 02(6.5%) had an average QoL whereas 02(6.5%) had high QoL. This comparison of GWB on the basis of marital status showed that married HCWs had low QoL (87%) as compared to single workers (47.4%). A study conducted in dental graduates to observe the relationship between marital status and their level of stress [18]. The result of our study is supported by Shetty *et al.*, study that married workers experience more stress as compared to those HCWs who are single. The more interesting thing about our study is that the WRQoL level with respect to HWI, CAW, WCS and SAW were same in both individuals but the general well-being (GWB), Job Career Satisfaction (JCS) and overall WRQoL in single HCWs is higher as compared to the married workers. A study on medical post graduate students was carried out to evaluate their level of stress regarding their job or career insecurities and their future concern [19]. It was

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demonstrated that clinical had higher level of stress and work pressure or burnout as compared to academic PGTs. The result of this study also positively reinforces our results that HCWs had higher level of stress. The WRQoL which we measured in our study depicted that the married HCWs had lower quality of life as compared to the single workers ($p<0.05$). the level of stress in both groups had depicted no significant difference. So, it is concluded that PSS is same in both single and married Healthcare -workers but work -related QoL in single HCWs is higher as to those who had marital status of married. Research conducted in dental graduates by Ghafoor *et al.*, to evaluate the effects of marital status and its impact as an indicator of stress in post graduate students [20]. The results of this study support our study that married workers are more stressed than single one.

## CONCLUSIONS

It is concluded from this study that level of stress in in healthcare worker is same irrespective of their marital status but work related-QoL is low in married individuals as compared to single HCWs.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Effect of Zinc Supplementation in Prevention of Necrotizing Enterocolitis in Preterm Neonates

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## ABSTRACT

Necrotizing enterocolitis is a serious condition involving the gastrointestinal tract and is one of the most common causes of death in neonates. It occurs due to various factors including the altered immune response of the premature intestinal tract against gut microbiota, resulting in inflammation and damage to the gut. **Objective:** To find out the effect of Zinc in the prevention of necrotizing enterocolitis in very preterm infants in the first 2 weeks of life. **Methods:** It was a double-blind randomized control trial held in the Neonatology section of Pediatric Medicine unit-II, Mayo hospital Lahore. The duration of the study was 11 months after the approval of the synopsis from August 2019 to July 2020. A total of 94 patients were included in the studies (95% confidence level, 7% absolute precision). Probability sampling, a simple random sampling technique was used. The study included 94 patients, 28 weeks to 32 weeks of gestational age. **Results:** In this study, the mean age of neonates was 54.85±11.60 hours, 51(54.26%) patients were male whereas 43(45.74%) patients were females. A birth weight having <1 kg was observed in 20(21.3%) patients and a birth weight between 1-2 kg was observed in 49(52.1%) patients. Necrotizing enterocolitis was developed among 6(6.38%) patients. Among the zinc supplementation group, the NEC developed in 2(4.3%) patients whereas, among the placebo group, the NEC developed in 4(8.5%) patients (p-value=0.677).**Conclusion**: This study concluded that zinc supplementation did not prove any preventive effect against necrotizing enterocolitis in very preterm infants.

## INTRODUCTION

Necrotizing enterocolitis (NEC) is the major cause of neonatal death and a leading cause of gastrointestinal tract-related emergencies in newborns [1]. Up to 10% of premature neonates with less than 29 weeks of gestational age, develop necrotizing enterocolitis [2]. It is an inflammatory and ischemic response of the gut mainly occurring in premature neonates [3]. The exact mechanisms of pathogenesis of necrotizing enterocolitis are not completely known. Immaturity of the intestine, hypoxic-ischemic encephalopathy, impaired/abnormal inflammatory response, and infections are the possible underlying mechanisms of developing it [4]. Enteral feeding, prematurity of the gut, and normal gut flora play important roles in gut damage and ultimately the development of necrotizing enterocolitis [5]. The imbalance between pro- and anti-inflammatory factors in premature neonates results in abnormal activation and inactivation of inflammatory mediators and mediators like

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platelet-activating factors are thought to be involved in the pathogenesis of necrotizing enterocolitis. Abnormal toll-like receptor 4 signaling in the premature intestine and increased activation of nuclear factor-κB may play a role in the pathogenesis of necrotizing enterocolitis [4]. Zinc is essential for the synthesis of many enzymes involved in the metabolism of nucleic acid, protein synthesis, immune functions, and organ formation [6]. It has a role in controlling of epithelial barrier mechanism and developing proper immune responses [7]. It also acts on toll-like receptor 4 and modulates the immune mechanism. Zinc is essential for the brain and gut development during organogenesis [8]. Zinc deficiency in premature neonates occurs due to reduced transfer of zinc from the placenta resulting in low stores and excessive endogenous losses and less intake [9]. Zinc supplementation can play in the etiology and therapy of a wide range of gastrointestinal diseases [10]. Those Subjects who had low zinc levels expressed a poor immune response and some antioxidant activities [11]. There is extensive research going on the supplementation of Zinc in preterm infants for the reduction of morbidity and mortality. There are multiple studies supporting the evidence that zinc when given at different doses plays a positive effect on mortality, morbidity, and growth in infants and children [12]. Some studies demonstrate that zinc is equally effective as probiotics in the prevention of necrotizing enterocolitis in preterm infants [13]. A randomized controlled trial conducted in low birth-weight very preterm infants showed that the occurrence of necrotizing enterocolitis was significantly lower with high doses of zinc in those infants [14]. However, no systematic study has been carried out so far on the possible effect of zinc in the development of necrotizing enterocolitis [15-16]. The rationale of this study was to identify the effect of Zinc therapy on preventing necrotizing enterocolitis in very preterm infants. So if the effect of zinc is established in the prevention of this complication of neonates, it will be a major step in reducing neonatal morbidity/mortality. Objective of this study was to evaluate that Zinc supplementation prevents the development of Necrotizing enterocolitis in very preterm infants.

## METHODS

Randomized control trial, double-blind. Neonatology unit of Pediatric Medicine unit-II, Mayo Hospital Lahore. The duration of the study was 11 months after the approval of the synopsis from November 2019 to April 2020. The sample size of 94 patients (47 patients in each group) was estimated by using a 95% confidence level, and 7% absolute precision with expected Zinc% as 0% and the control group as 6.3% [17].

$$n = \frac{Z^2_{1-\alpha/2}[P_1(1-P_1)+P_2(1-P_2)]}{}$$

Probability sampling, a simple random sampling technique was used. Neonates admitted in the ward with age meeting inclusion criteria were examined for Ballard's score before they were enrolled for the study. Ballard's scoring was done by a panel of 3 members (2 residents and the senior registrar of the section) in order to reduce any chance of poor scoring an average of 3 scores was taken. All the residents were properly guided in calculating the APGAR score beforehand. After taking informed written consent, patients admitted to the neonatology section and meeting the inclusion criteria were included in the study. Randomization was performed by using computer-generated numbers. Group A was given zinc while group b received a placebo. It was a double-blind randomized control study because the staff administering the drug was not informed about the contents of the bottle and doctors measuring the outcome were also informed about the drug or placebo given. Before that, enteral feeding was initiated on the 2nd or 3rd day of life at 5-10ml/kg/day in all stable infants. Feeds were divided into 8 equal parts. Expressed breast milk was the first preference but if it was not available appropriate preterm formula feed will be used. Once the patient has tolerated enteral feed (no gastric residual volume or vomitus) for one day, the trial drug was added on the next day. It was given in two divided doses. Feeding was stopped if there are any signs of feed intolerance. Inclusion criteria: Very Preterm infants (gestational age 28 to < 32 completed weeks), Age 0-72 hrs, both sexes, Mode of delivery NVD/ C-Section, Born elsewhere. Exclusion criteria: Congenital malformation (major on gross physical examination). Obvious dysmorphic/ Syndromic baby. Asphyxia –stage II, III. Diagnosis of necrotizing enterocolitis was recorded according to Modified Bells staging, once infants completed two weeks study period. Whether the patient developed NEC or not was measured according to Modified Bell's staging criteria and was recorded by the resident. X-ray was reported by a consultant radiologist. Data were tabulated and analyzed by SPSS version 26. Quantitative variables like age were presented as Mean± Standard deviation. Qualitative variables like gender were presented as frequency and percentages. Difference of two groups (Zinc supplemented VS placebo) between gender, gestational age, placebo or drug was given pt. developed NEC or not, pt. developed vomiting or diarrhea or not was done by applying the chi-square test. p-value ≤ 0.05 was taken as significant.

## RESULTS

In our study total of 94 neonates were enrolled. The data were normally distributed as the p-value of the KS test was

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0.100. According to this study among the zinc supplementation group a birth weight <1 kg was found in 11(23.4%) patients, a birth weight 1-2 kg was found in 22(46.8%) patients and a birth weight >2 kg was found in 14(29.8%) patients. Similarly among the placebo group a birth weight <1 kg was found in 9(19.1%) patients, a birth weight of 1-2 kg was found in 27(57.4%) patients and a birth weight >2 kg was found in 11(23.4%) patients. This difference was statistically insignificant. i.e. p-value=0.586 (Table 1).

**Table 1:** Comparison of the weight of neonates between study groups

| Birth Weight (kg) | Study Group | | Total | p-value |
|---|---|---|---|---|
| | Zinc Supplementation | Placebo | | |
| <1 | 11(23.4%) | 9(19.1%) | 20 (21.3%) | 0.586 |
| 1-2 | 22(46.8%) | 27(57.4%) | 49(52.1%) | |
| >2 | 14(29.8%) | 11(23.4%) | 25(26.6%) | |
| Total | 47(50.0%) | 47(50.0%) | 94(100.0%) | |

NEC developed in 4(8.5%) patients. This difference was statistically insignificant. i.e., p-value=0.677(Table 2).

**Table 2**: Comparison of NEC development between study groups

| Develop NEC | Study Group | | Total | p-value |
|---|---|---|---|---|
| | Zinc Supplementation | Placebo | | |
| Yes | 2(4.3%) | 4(8.5%) | 6(6.4%) | 0.677 |
| No | 45(95.7%) | 43(91.5%) | 88(93.6%) | |
| Total | 47(100.0%) | 47(100.0%) | 94(100.0%) | |

In our study among the zinc supplementation group, vomiting was observed in 3(6.4%) patients while among the placebo group, the vomiting was observed in 2(4.3%) patients. Similarly, among the zinc supplementation group diarrhea was observed in 4(8.5%) patients while among the placebo group diarrhea was observed in 4(8.5%) patients. This difference was statistically insignificant. i.e. p-value=0.688(Table 3).

**Table 3:** Comparison of side effects between study groups

| Side Effects | Study Group | | Total | p-value |
|---|---|---|---|---|
| | Zinc Supplementation | Placebo | | |
| Vomiting | 3(6.4%) | 2(4.3%) | 5(5.3%) | 0.688 |
| Diarrhea | 4(8.5%) | 4(8.5%) | 8(8.5%) | |
| Nil | 40(85.1%) | 41(87.2%) | 81(86.2%) | |
| Total | 47(100.0%) | 47(100.0%) | 94(100.0%) | |

## DISCUSSION

Our study aimed to evaluate the effect of zinc supplementation on the incidence of necrotizing enterocolitis (NEC) in very preterm infants. We followed a double-blind randomized controlled trial design with a sample size of 94 patients, divided equally into a zinc supplementation group and a placebo group. The results showed that there was no statistically significant difference between the two groups regarding birth weight, the incidence of NEC, vomiting, or diarrhea. While in literature mostly observational study and reviews are available. The study by Kreb and colleagues highlighted the importance of zinc in growth, cell differentiation, gene transcription, metabolism, hormone and immune function, as well as wound healing [18]. In preterm neonates, zinc stores are low due to inadequate absorption and storage mechanisms. Terrin and Berni's study found that zinc can prevent NEC through its effects on the intestinal mucosa and modulation of intestinal permeability. However, their study did not use a high dose of zinc. Their study had significant output and our study had non-significant results due to limited sample size [12]. Two meta-analysis by Livingstone and Mashad, *et al.*, provide us a comparison of effects of zinc on neonates. Zinc is digested and absorbed in the upper gastrointestinal tract into enterocytes and is entered into a small plasma pool. Humans have no dedicated zinc stored in any specific organ. This analysis highlights the efficacy of zinc like our study [19, 20]. Our study of double-blinded randomized control trial at the Neonatology unit of pediatric Medicine unit-II, Mayo hospital Lahore aimed to investigate the effect of high-dose zinc supplementation on the prevention of NEC in very preterm infants. The study found no preventive effect against NEC with the use of high-dose zinc supplements in the diet of very low birth weight neonates. While previous studies available were focused on the dosage of zinc, occurrence of necrotizing enterocolitis was significantly higher in the placebo group as compared to the zinc supplementation group. The dose of zinc used in this study was 4mg/kg, which is within the Tolerable Upper Intake Level for zinc intake set by the Institute of Medicine for infants in the first 6 months of age. A hospital based study done by Terrin and Berni, which was a randomized control trial had similar methodology as our study. Zinc can prevent NEC through its trophic effects on the intestinal mucosa and modulation of intestinal permeability so it affects the morbidity and mortality of neonates. While our study had no follow-up indicators involved and highlighted the efficacy of zinc supplementation [21, 22]. Canani *et al.*, compared zinc with probiotics in the prevention of NEC and found no statistically significant difference between the two groups. However, there was a slightly better outcome in the probiotic group as compared to the zinc group [23]. By comparing all these studies with our study we can say that, zinc supplementation can benefit the development and growth of neonates, reduce illness, and mortality. Zinc dose is crucial in the efficacy of treatment, as very high doses may lead to toxicity and reduced absorption of copper and iron. The supplement dose used in the studies mentioned in this article was within safe limits [24]. There were some limitations in our study. Because our study

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included only very preterm neonates, we cannot generalize it to other preterm neonates. There was also some difference in formula feed and human milk usage in the two groups of study. Our study also didn't include any measurements of serum zinc and hemoglobin levels. It was because of avoiding additional procedures in the preterm neonates due to minimal handling. Also, blood sampling in very preterm neonates can cause iatrogenic anemia. So separate studies can be done showing levels of zinc and then its association with replacement of it in preterm infants for prevention of NEC.

## CONCLUSIONS

This study concluded that the use of zinc supplementation has no preventive effect for necrotizing enterocolitis in very preterm infants within the neonatal period. So in light of this study, we did not find any convincing evidence regarding the prevention of NEC by zinc supplementation for breastfed LBW neonates. However, further studies can be carried out to find out the positive effects of Zinc.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Public Perception and Satisfaction with Health Insurance through Sehat Insaaf Card in Punjab

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## ABSTRACT

Sehat Sahulat program, universal health coverage for the population of Pakistan, had been implemented since 2015 and the accessibility and universality of all the services got implemented in 2020 all over Punjab. Health is the right of every person, and the Sehat Insaaf card was found to provide equal rights and benefits to all. An initiative by WHO, which provide essential health services. **Objective:** To find the perspective of people who availed of the Sehat Insaaf card, either for medical treatment or surgical procedure, and evaluate the level of satisfaction with the Sehat Sahulat program among the population. **Methods:** A Descriptive Observational Study, with a sample size of 350 calculated on the WHO calculator for survey analysis version 2.0, based on survey style questionnaire filling, to calculate the satisfaction level by Likert scale among patients and attendants, who had their treatment and surgeries in Akram Medical Complex, Lahore. The study had been conducted for 6 months, from August 2022 to February 2023. **Results:** Statistical tests were applied on data to evaluate the percentage and cumulative percentage of satisfaction. The overall satisfaction score was 98.765%. the cumulative percentage for satisfaction rate for surgeries was high than the medical treatments with a percentage of 89.653 for surgical procedures and 74.564% for medical check-ups. **Conclusions:** The Sehat Sahulat program proved a successful program facilitating in countries like Pakistan and all over Punjab, a load of patients from government tertiary care hospital had been divided, and rich and poor are equally facilitated.

## INTRODUCTION

Basic healthcare facilities are the right of every person nearly half of the population is deprived of basic healthcare facilities. The universal health coverage initiative by the world health organization is working under the agenda to provide health care services, disease prevention, and rehabilitation to the nation [1]. UHC targeted nations from low social economic backgrounds areas to provide universal health care services to all. The parameters involved include financial risk protection. accessibility of health care services, effective health care services, affordable health care services, and vaccination for all. Pakistan is categorized as a low and middle-income country in south Asia with a population of 22 million [2]. Punjab is the second-largest province in Pakistan. Many healthcare programs by the WHO were previously implemented under the umbrella of SDGs sustainable developmental goals. Previously these national health services were under the federal government but now Punjab is overtaking the implementation of the SSP Sehat Sahulat program by itself [3]. The census data from the bureau of statistics and the Pakistan social economic ministry Sehat Sahulat program is working in collaboration. The total number of families involves 41480603 dated 9th of march 2023. The priority services provided by the SSC program included nutrition, immunization, health insurance, upgrading emergency care facilities, uniform

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diagnostic rates, and complaint management systems. The Sehat Sahulat program is working for health insurance coverage in all 36 districts of Punjab [4]. School health and nutritional program, in public schools. In Pakistan, nearly 40 percent of the population is living under the poverty line making it unrealistic for these members of the population to rely on the private sector [5]. The accessibility of the program by NADRA is very easy and daily, private hospitals register themselves for the program. Integrated health management system to provide better services across Punjab is working for standardization of private and public health care facilities. The charter and the beneficial program mentioned on the website is daily updating [6]. Not only for updating the census data of enrolled participants but also for the improvement of the program. Right from the implementation of the program in 2015 the domains of the program will be implemented in 2030 [7]. SDGs which were adopted by Pakistan in February 2016 have been used as indicative and reference markers for the Sehat Sahulat program SDG 1 corresponds with the poverty exclusion from the population health for all and is also one of the main agendas of the SDGs. many social evils come with poverty like corruption is paramount [8]. The health care facilities helped us to live in a better environment. The Sehat Insaaf card was expected to provide accessible and affordable quality services to more than 80 million people in the upcoming year. Government and non-government organizations collaborating with the Sehat Sahulat program target quality services and bring benefits to the general public who are the beneficiaries of the program [9].

## METHODS

An Observational Descriptive Study of 350, Non-Probability, Purposive Sampling., patients or attendants in Akram Medical Complex, Lahore. The patients who got their treatment on Sehat Insaaf card and availed of the services were included in the study. While the private patients in OPD or emergency department, the patients who were refused and did not fall under the domains of health care (Cosmetology Surgery), and patients who were having 3$^{rd}$ or 4$^{th}$ surgery and running out of credit for health care, were excluded. This study was conducted for a period of 6 months (August 2022 to February 2023). A survey method questionnaire specifically designs scoring; satisfaction level in patients getting their treatment on health cad, quality of services, and basic health care challenges they experienced. Informed and written consent was taken from the parents of patients after the introduction of the research purpose. This study followed the World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects (Helsinki 2013). Results were expressed as frequency and percentages and satisfaction level was calculated. Statistical evaluation was performed by running the SPSS/PC software package 24.0 (SPSS, Inc., Chicago, IL, USA).

## RESULTS

Response rate calculating the level of satisfaction. The accessibility of the card scored 82.45. choice of consultant and services scored 75.97%. relief from medicine financial burden scored 100%. the quality of services scored 95.76%. and a cumulative percentage of 99.19% of respondents supported this service to continue (Table 1).

**Table 1:** Response rate of the population, who availed the Sehat Insaaf card facility

| Questions | Always | Often | Sometimes | Occasional | Never |
|---|---|---|---|---|---|
| Was the service easily available? | 82.45 | 9.2 | 3.1 | 1.8 | — |
| Did you find your desired consultant's service by health card? | 75.97 | 15.9 | 4.8 | - | - |
| Did you have to pay anything extra at the hospital? | 00 | 00 | 00 | 00 | 100 |
| Are you satisfied with the behavior of healthcare personnel? | 76.90 | 12.99 | 7.9 | — | — |
| Are you satisfied with the treatment you got on Sehat Insaaf card? | 95.76 | 10.5 | 3.6 | — | — |
| Did you experience any kind of difficulty in availing of the offer? | 75.78 | 17.90 | 6.9 | — | — |
| Do you want this service to continue? | 99.19 | 0.03 | 0.78 | 0.9 | 0.2 |
| If you think that the service needs any changes? | - | 2.67 | 4.56 | - | 95.78 |

p-value=0.0017

The satisfaction level for the surgical procedure had a percentage of 74.5645%, satisfaction level of surgical procedures had a percentage of 89.653%, overall satisfaction level had an optimal positive percentage of 98.765% (Table 2).

**Table 2:** Satisfaction level for the surgical procedure

| Satisfaction level, descriptive calculations | Never |
|---|---|
| Satisfaction level for medicine treatments | 261(74.564) |
| Satisfaction level for surgical treatments | 314(89.653) |
| Overall satisfaction score | 343(98.765) |

Supporting response for the Sehat Sahulat program was 79.0% calculated based on the accessibility and efficacy of the program. With a valid percentage of 79% (Table 3).

**Table 3:** Response for the Sehat Sahulat program

| Service accessibility and supporting response for the Sehat Sahulat program | Frequency (%) |
|---|---|
| No | 21(21) |
| Yes | 79.0(79) |

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## DISCUSSION

There are fewer studies available held in Punjab on the Sehat Sahulat program which can calculate the efficacy of the project. The satisfaction level of patients and the perception of health care facilities that are provided by the program have not been calculated previously. Some review articles discussed the UHC preliminary face SSC agendas and SDGs formulation in Punjab. In our study, we focused on the population who had availed of the health care facility through the Sehat Sahulat program. The output for the medical treatments had a relatively low percentage of satisfaction while the free surgical procedures in private setups had a greater satisfaction level [10]. We used the same classification which had been used by the charter of the Sehat Sahulat program. the same division of disease packages was used. And the satisfaction level was calculated by the percentage. Previously no such quantitative study was conducted on the Sehat Sahulat program. We experienced a lack of information regarding some procedures and medical checkups. Priority and secondary disease packages for heart, dialysis, organ failure, cancer management, neurosurgical procedures, surgical treatments, and maternity services scored high with high cumulative percentages with a positive response rate from the population. While the disease packages for diabetes mellitus complications, burns, and accidents, chronic disease necessitating admissions and medical procedures had a satisfaction level of moderate level. The overall satisfaction score among the population was very high with a frequency of 343 and a percentage of 98.765%. Pakistan has a poor socioeconomic profile, with a high poverty rate and low literacy rate. The literacy rate was a common predictive variable for the level of knowledge. In this study, we encounter the population who had availed the treatment by the Sehat Insaaf card and the literacy rate was not assessed to check the socio-demographics of the population [11]. If we compare Pakistan to south Asian and global counterparts, Pakistan has a long way to go in matching the healthcare provision of primary secondary, and tertiary healthcare departments. Key achievements include the accessibility and efficacy of the Sehat Insaaf card. And quality services for all in the health care system of Punjab. The implementation of the project had a very high satisfaction rate among the population without socioeconomic differences. This plan is the execution of a universal healthcare system in Punjab and all over Pakistan [12, 13]. The human development index HDI by the United Nations concluded on 189 countries which Pakistan was ranked 154$^{th}$ position. The ranks were decided on the base of education health and standards of living. And if we compare Pakistan to other countries we are lacking far behind. The COVID 19 worsened the situation and pandemic effects on the health system are still not covered [14]. If we compare UHC in Pakistan and other third-world countries like BANGLADESH and ETHIOPIA, the program is implemented under WHO but in the integration of the program, Reich and his colleagues evaluated the program specification which is still under the initial programming stage. While in Pakistan or specifically in Punjab the UHC had been successfully implemented. Comparing the UHC program globally VIETNAM, GHANA, and PERU are the countries where this program is an ultimate success either for medicine or surgical procedures the satisfaction rate is 100% similar to in Punjab, Pakistan, there are gaps in some services about dentistry, and cosmetology which are under process [15]. The satisfaction rate of the program universal health is very low in some countries like BRAZIL, THAILAND, and TURKEY. The sustainability of the project is below average. While in Pakistan the UHC is successfully implemented in all provinces [16]. Ikegami *et al.*, study found that Japan has an advanced form of universal health coverage system, divided into two groups employee-based and community-based groups. The universality of insurance is implemented in 1961. the negative side is income-paid premium packages that are not equal for all. While in Punjab the universality is equal no discrimination in different economic classes. As discussed in our study, no socio-economic difference is found among beneficiaries of the Sehat Insaaf Card [17]. In Canada and USA, self-reported health is based on income. A middle-income person was in the category of poor or fair health insurance category in Canada and the same applies in the US. US citizens used the Medicare program for basic health coverage. Also, there is a specific age for basic health care coverage that is under 65 found in Canada but not in the US. These drawbacks are not part of universal health coverage and were proven by our study [18]. The Sehat Insaaf card expands its facility to every person and made it accessible to all [19]. Daily data uploaded on the website for the entries of medicine and surgery cases. The data is online readable and accessible by every person. That is an advantage of using the Sehat Sahulat Program [20].

## CONCLUSIONS

Although it seems that Pakistan has a long way to go before matching its South Asian and global counterparts in its primary, secondary, and tertiary healthcare provisions, the Sehat Sahulat program proved a successful program facilitated in countries like Pakistan and all over Punjab. The load of patients from government tertiary care hospital had been divided, and rich and poor are equally facilitated.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Narcissism and Selfitis Disorder Features among Young Adults: Body Dysmorphic Disorder as Mediator

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## ABSTRACT

Nowadays young generations are involved in such activities which abolish their life seriously. In today's world everyone wants to look flawless and wants to be praised. **Objective:** To investigate the mediating effect of body dysmorphic disorder on narcissism and selfitis disorder among young adults. **Methods:** The sample size for the present study was 400 young adults. Convenient sampling technique was used for screening of young adults on Body Image Concern Inventory and further data were collected on Selfitis Behavior Scale and Narcissistic Personality Inventory from screened sample. Inclusion criteria included all the young adults aged between 20 to 35 and have body dysmorphic disorder. **Results:** Narcissism had significant positive correlation with features of both selfitis disorder and body dysmorphic disorder. Age of persons had significant negative correlation with narcissism, selfitis disorder and features of body dysmorphic disorder. Outcomes revealed that both selfitis disorder and narcissism are greater in males, while features of body dysmorphic disorder are greater in females as compared to males. **Conclusions:** This study will be beneficial for professionals (sociologists and social workers) for creating awareness in young generation about flaws or defects in the physical appearance should not be considered as life frightening conditions and they should appreciate themselves as they are.

## INTRODUCTION

In the contemporary world, there are a bunch of narcissistic individuals that are intensely in love with their reflections. But the difference is they don't look steadily and intently at their image in water but on the sparkling screens of their smartphones. In our lives, we are not aware that one psychological issue may cause a lot of other psychological issues. Nowadays our young generations engage in such activities which abolish their life seriously. In the modern world, everyone wants to look flawless and wants to be praised. Social media websites show a flawless and perfect image of the people that badly affects our young generation. Perfectionism is the enemy of their lives; as result, so many individuals have an obsession and compulsion with their different bodies. Obsession with the body could lead to subsisting or copying behaviors like they spend hours taking perfect and flawless selfies in order to reduce anxiety. They have hundreds of photographs of their looks to lessen their anxiety and satisfy them. They use beauty cameras like snap chat to smooth out skin and to make face slim, lip filters, teeth whitener to look flawless in their selfies or photographs, all these actions are the gateway to perceive oneself in a whole new perfect way and as a result user's want to replace his/her self in practical life. Excessive and regular selfies taking lead to inflated

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self-admiration and cause dysfunctional behaviors. Preoccupation with body parts could lead to indulgence in various forms of coping behaviors. To reduce anxiety users are frequently using technology like beauty cameras to take selfies in order to get appreciation from other users [1]. Body Dysmorphic Disorder is a distressing obsession and compulsion with one or more imaginary or minor flaws in body appearances, these obsessions may cause significant distress and impairment their social and occupational functioning. The individual with body dysmorphic disorder does repetitive behaviors like mirror checking, excessive grooming, changing cloth, again and again, skin picking. All these behaviors are performed in order to reduce their anxiety. These obsessions can be associated with any part of the body [2]. Selfitis Disorder is an obsessive-compulsive desire to take photos of one's self & then share these photos on social media websites and a person's continuous desire to look good in selfies and to show these to others. There are 3 levels of Selfitis Disorder (Borderline, Acute, Chronic). All these level is based on the frequency and sharing of selfies on social media [3].Selfies posting behavior on social media is positively correlated with self-objectification, weight dissatisfaction, and comparison of physical appearance [4]. Narcissism is a sense of individuality or a grandiose feeling of self-importance. A narcissistic person is always concerned with imaginations of unlimited power, beauty, success, brilliance, and love. Narcissistic individuals think that they are superior to others and they also have an excessive need for the approval of others they want everyone to praise and admire them and they are not tolerating criticism of others because they perceive themselves as exceptional and unique. They also have interpersonal relationship problems because of a lack of empathy, idealization, and devaluation [5].Narcissistic personality trait is relatively high in individuals with body dysmorphic disorder [6]. Social-media websites give the opportunity to narcissistic persons to keep the focus on their profile's photo. They post photographs, comments, and updates status for satisfaction; which represent only them, and by doing this they are enhancing or maintaining their self-center nature [7]. Selfie-taking and posting behaviors are closely related to narcissism personality disorder [8]. American Academy of Facial Plastic and Reconstructive Surgery is one of the well-known aesthetic institutes in which more than 2,500 cosmetics, dermatoplasty, reconstructive, rhytidectomy surgeons work from all over the world. It is stated by 55% of surgeons; that a lot of patients come for plastic surgeries to improve their appearance in selfies because they think that when they took selfies their nose looks too big in it. According to plastic surgeons now most patients show their own filtered selfies rather than showing the photos of beautiful celebrities for plastic surgery in order to get a perfect and flawless look of themselves. These beauty cameras and filters diminish the actuality and take towards the imagination and this behavior has very destructive consequences especially for youngsters and perpetuates Body Dysmorphic Disorder [9]. There is a high ratio of narcissistic individuals who love to see their reflections on their phones. Obsessions with body parts cause anxiety in the individual. To reduce their anxiety, individuals involve in different coping behaviors, for perfect click, they use different filters and cameras to modify their face shape. These entire acts are the gateway to perceive oneself in a whole new perfect way these beauty cameras diminish the actuality and take towards the imagination and as a result, persons want to replicate them self in real life. Excessive selfie-taking behaviors also cause a life-threatening situation which may cause serious injury or death of the person [10]. The outcome of the meta-analysis exposed that men constantly scored higher on narcissism which indicates that on average males are more narcissistic as compared to females [11]. The current research study had the following objectives: To investigate the relationship between features of body dysmorphic disorder, narcissism, and selfitis disorder among young adults. To study the mediating effect of body dysmorphic disorder on narcissism and selfitis disorder among young adults. To find out the role of demographic variables (age and gender) on body dysmorphic disorder, narcissism, and selfitis disorder features. The hypotheses formulated for the present study were: Narcissism will be positively correlated with features of body dysmorphic disorder and selfitis disorder. Body dysmorphic disorder mediates the relationship between narcissism and selfitis disorder. Gender differences will exist with respect to body dysmorphic disorder, narcissistic personality disorder, and selfitis disorder features among young adults. Age of individuals will be negatively correlated with body dysmorphic disorder, narcissism, and selfitis disorder features among young adults.

## METHODS

The current study was quantitative and cross-sectional. A survey method was used to collect the data for the present study. Total three instruments were used in the present study: The Body Image Concern Inventory (BICI), Selfitis Behavior Scale (SBS), Narcissistic Personality Inventory NPI-16, and demographic sheet. Inclusion criteria include all the young adults aged between 20 to 35 and have features of body dysmorphic disorder. The Body Image Concern Inventory (BICI) was used as a screening tool for the present study. BICI was administered on 1800 young adults, 400 individuals who met the criteria of Body

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Dysmorphic Disorder by obtaining scores greater than the cut-off point on the scale were selected as a final sample for further analyses on the Narcissistic Personality Inventory &Selfitis Behavior Scale. All those young adults who did not met the criteria of Body Dysmorphic Disorder were excluded. For the present research study, appropriate statistical analyses were used, Hayes PROCESS macro technique was use to check the mediating effect of BDD on Narcissism and selfistis disorder. Co-relation analysis was used to check association between variables, and independent sample t-test was used to check gender differences on all three variables. P-value<0.05 considered as significant.

## RESULTS

The first step in data analysis was to check the alpha value of all scales. The calculated alpha value for BICI was.80, for NPI-16 the alpha value was .72 and for SBS alpha value was .82. These values indicated that all scales have satisfactory values of reliability. All of these scales have good validity as entire items of the scales have a significant positive association with total scores of the respective scales. In the present research the data of (N = 400) of young adults who met the criteria of Body Image Concern Inventory (BICI) were analyzed. The outcomes of analyses are mentioned below. Results of Table 1 showed significant positive correlation of Body Image Concern Inventory with Narcissistic Personality Inventory and Selfitis Behavior Scale. It was also revealed that the age of individuals has significant negative correlation with BICI, NPI and SBS.

**Table 1:** Correlation Coefficient among Age, Body Image Concern Inventory, Narcissistic Personality Inventory, Selfitis Behavior Scale(N=400)

| Sr # | Measures | 1 | 2 | 3 | 4 | Mean ± SD |
|---|---|---|---|---|---|---|
| 1 | BICI | - | .46** | .47** | -.41** | 79.23±4.58 |
| 2 | NPI | - | - | .38** | -.31** | 11.50±2.52 |
| 3 | SBS | - | - | - | -.37** | 85.30±5.48 |
| 4 | Age | - | - | - | - | 23.11±3.14 |

Note: BICI = Body Image Concern Inventory; NPI = Narcissistic Personality Inventory; SBS = Selfitis Behavior Scale; M = mean; SD = standard deviation.

Results showed that the strength of relationship exists between narcissism and features of selfitis disorder were altered because of mediating effect of body dysmorphic disorder (BDD). The outcomes of mediation analysis revealed that narcissism was indirectly related to features of selfitis disorder, through its relationship with body dysmorphic disorder. The path a, of figure one revealed that narcissism reported high relationship with body dysmorphic disorder (a = .1838**, p = .049).Similarly, path b indicated that significant association of body dysmorphic features with features of selfitis disorder (b = .1409*, p = .011). Result of path c, also showed significant positive impact of narcissism on features of selfitis disorder (c = 8688***, p = .001). The results also indicated that the indirect effect (ab = .0258) was totally above zero (.0039 to .0781). Furthermore, narcissism led to more borderline personality features of selfitis disorder after taking into account narcissism in direct effect through body dysmorphic disorder(C' = .8949***, p = .001) (Table 2 and Figure 1).

**Table 2:** Summary of Mediation Analysis for Selfitis Disorder with Narcissism as Independent Variable

| DV | M | Effect of IV on M | Effect of M on DV | Direct effects | Indirect effect | Total effects |
|---|---|---|---|---|---|---|
| Selfitis disorder | Body dysmorphic disorder | .1838** | .1409* | .8688*** | .0258** | .8949*** |

Note: DV = dependent variable; IV = independent variable (narcissism); M = mediating variable a significant point estimate. *p<.05, ** p < .01, ***p < .001.

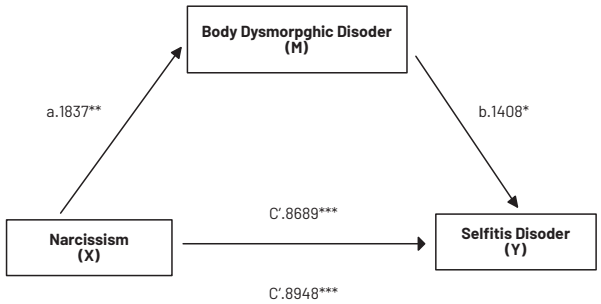


**Figure 1:** Mediation Analysis of Body Dysmorphic Disorder Features between Narcissism and Selfitis Disorder

Table 3 revealed significant gender differences on BICI, NPI and SBS, which showed that both features of selfitis disorder and narcissism are more is males as compared to females whereas features of body dysmorphic disorder are greater in females as compared to males.

**Table 3:** Gender Differences on Body Image Concern Inventory (BICI), Narcissistic Personality Inventory (NPI) and Selfitis Behavior Scale(SBS; N = 400)

| Variable | Males (n=200) | Females (n=200) | t(398) | p | 95% CI | | Cohen's d |
|---|---|---|---|---|---|---|---|
| | Mean ± SD | Mean ± SD | | | LL | UL | |
| BICI | 78.10±4.00 | 80.33±8.01 | 3.4 | .001 | -.3.441 | -.94 | .33 |
| NPI | 12.31±2.40 | 10.71±2.51 | 6.3 | .001 | .092 | 2.05 | .63 |
| SBS | 87.01±8.51 | 83.52±6.81 | 4.6 | .001 | .01 | 5.01 | .46 |

Note: BICI = Body Image Concern Inventory; NPI = Narcissistic Personality Inventory; SBS = Selfitis Behavior Scale; M = mean; SD = standard deviation; CI = confidence interval; LL = lower limit; UL = upper limit.

## DISCUSSION

The present study intended to explore the mediating effect of body dysmorphic disorder (BDD) features on narcissism and features of selfitis disorder (SD). The analysis of the current study exposed a significant positive correlation of Narcissistic Personality Inventory with Selfitis Behavior

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Scale and Body Image Concern Inventory (see Table 1), these results are also supported by the past researches that selfitis disorder was positively correlated with loneliness and narcissism [12]. Moreover, analysis of previous study concluded that narcissism and hyperactivity were positively associated with Selfitis Disorder [13]. Body dysmorphic disorder (BDD) is strongly correlated with dark attributes of personality. The outcomes proposed that obsessional personality traits and narcissistic personality disorder are positively associated with Body Dysmorphic Disorder [14]. An outcomes of cross-sectional study showed that girls who have selfitis disorder (SD) and consistently post their selfies on social media websites have significantly more overvaluation of the shape and weight of the body, dietary restraint, and internalization of the thin ideal [15]. The outcomes of mediation analysis revealed that narcissism was indirectly related to features of selfitis disorder, through its relationship with body dysmorphic disorder. When both body dysmorphic disorder and narcissism are lapsed together to clarify their impact on selfitis disorder (SD), then this relationship was found to be significant. Outcome also revealed the indirect effect (ab = .0258) was completely above zero (.0039 to .0781). The situation could be understood that the strength of the relationship that exists between selfitis disorder and narcissism was altered due to mediating effect of body dysmorphic disorder (BDD). These results revealed that features of body dysmorphic disorder partially mediate between narcissism and selfitis disorder among adults. The results of the current study also revealed significant gender differences on NPI and BICI, which exposed that features of selfitis disorder and narcissism are more common in men as compared to women while BDD features are more common in females as compared to males (see Table 3). Previous research findings also support the current results by concluding that as compared to males, females were more concerned about their weight, cover-up with makeup, skincare, the shape of hips, and have bulimia nervosa. Females were more enthusiastic to take non-psychiatric medical treatment such as cosmetic surgery than males. Men habitually unveil their life by sharing pictures to pass their time and more important to seek disclosure gratification, so selfitis disorder is more common in men. However, women are more conscious about their privacy on social media so women are concerned about online self-disclosure [16]. The results also showed that the age of a person has a significant negative correlation with the Narcissistic Personality Inventory, Selfitis Behavior Scale, and Body Image Concern Inventory (see Table 1). These findings are nearly similar to the results of previous research which showed that persons with older age had significantly lower levels of narcissism as compared to participants of the middle-aged group [17]. The findings of the longitudinal study confirmed that narcissism tends to decrease as a person get matures. [18]. Selfie posting behavior is most common among teenagers as compared to older people [19]. It is also exposed that body dysmorphic disorder was more dominant among females as compared to males and body dysmorphic disorder was negatively correlated with age and income of the person [20].

## CONCLUSIONS

There is a significant positive correlation between body dysmorphic disorder, narcissism, and selfitis disorder. BDD partially mediates the relationship between selfitis disorder and narcissism. Age is negatively correlated with body dysmorphic disorder, selfitis disorder, and narcissism which show that as the age of the individuals' increases all variables start to decline in the individuals. Features of selfitis disorder and narcissism are greater in males as compared to females while body dysmorphic features are greater in females as compared to males. The outcome of current research will be helpful for mental health professionals for the depth understanding & root causes of body dysmorphic disorder, narcissism, and selfitis disorder for making clinical prevention and interventions of all these mental disorders.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Evaluation of Oral and Maxillofacial Masses in Sample Received in Pathology Department SMC/SGTH KPK

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## ABSTRACT

Cysts, polyps and inflammatory process are the major benign tumors of the oral cavity. The SCC, lymphomas, sarcomas of bones and soft tissues and rarely melanomas are malignancies of oral cavity. Distal metastases from of breast carcinoma, lungs, abdominal organs and prostate can occur in oral cavity. The age of these lesions is among less than one year kids up to 85 years old, almost 90% of the patient's average age of 40 years. These tumors distributed in all over the world especially in the socio-demographic area. **Objectives:** To evaluate the histopathological outlines of OMF specimens received in pathological Department of SMC/SGTH KPK. **Methods:** A cross sectional retrospective study. **Results:** Of a total of 321 samples 164 (51%) were male while 157 (49%) were women with a proportion of M: F=1.05: 1. Mesenchymal tumors, other than osseous tumor, have the maximum quantity of 33.9% cases trailed by epithelioid lesions, 20%, odontogenic masses 5.3%, lesions of salivary gland were 14.6%, lesions of benign cyst were 12.5%, inflammatory lesions 11% and the minimum numbers of oral and maxillofacial specimens was bone tumor with 2.9% cases. From the benign tumors fibro epithelial tumor 23% is the commonest. The SCC was 57%, the largest contributor among all malignancies. **Conclusion:** Our study demonstrate the variations of age, sex and location in the oral and maxillofacial masses. The malignant masses are common an elderly aged patients, while the benign are more common an early and middle age people.

## INTRODUCTION

OMF is usual site for different lesions, i.e. tumors and benign masses. Growths, in this region, shared 5% of all neoplasms. Owing to the difficulty of the site, inflammatory lesions and neoplasm effecting mouth and around the mouth tissues frequently existing a diagnostic task for all medical professionals [1-3]. The malignant lesions include SCC, malignancies of soft tissue and bones, lymphomas and seldom melanomas. The distal metastases from the breast, lungs, abdominal organs and prostate carcinoma are not rare. Out of all malignancies of the upper respiratory is SCC are ninety percent of the lining mucosa with comparatively infrequent tumors arising in soft tissues and salivary glands. Females are less affected then males. Adding, hybrid masses de-differentiation and the tendency for certain benign masses to progress to cancers can confuse Histopathological clarification. Regrettably, the morphological inconsistency of these masses is imitated by the IHC markers, which hardly beneficial in routine diagnosis of salivary gland epithelial neoplasms. As a result, Histopathological technique is the key break of the routine diagnosis [4]. Odontogenic tumors are arises from epithelial, mesenchymal and/or ecto-mesenchymal origins of the tooth-forming device and are found wholly inside the maxillofacial skeleton, or in the gingiva covering tooth-bearing areas or alveolar mucosa in edentulous site. Consciousness of basic medical features i.e. age, sex, and site are tremendously valuable in evolving differential diagnoses of Odontogenic tumors [5]. The purpose of this

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project was to determine the frequency and socio-demographic distribution of OMF tumors in KPK and nearby area.

## METHODS

The study was conducted in SMC/SGTH Pathology department, KPK. The study was conducted from Feb. 2017 to Feb. 2022.Retrospective cross-sectional the study was carried out in SMC/SGTH from Feb. 2017 to Feb 2022. All OMF biopsy satisfying the inclusion criteria were sent to SMC/SGTH, histopathology unit, which was significant to appreciate the tendency of OMF specimens and the number of specimens were 377 archives from Feb. 2017 to Feb. 2022. Non probability convenience sampling technique was used and was included on the study. Independent variables includes, site, age, gender, and year. Dependent variables were pathological finding. Inclusion criteria was all patients' specimen that received to histopathology department with OMF masses from Feb. 2017 to Feb. 2022. Exclusion criteria was specimens, which were failures Histopathological findings were excluded. Data were analyzed by using SPSS 22.0 version.

## RESULTS

Diagnosed OMF lesions total 321 specimens**.** The lowest OMF specimens were in 2017/18, 21(6.4%) and the maximum OMF biopsy record was in 2020/21, 134(35.5) biopsies (figure 1).

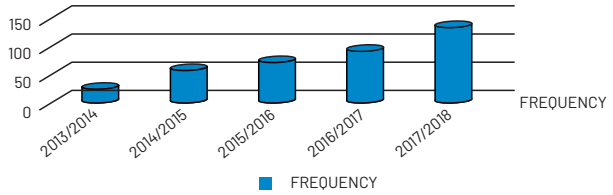


**Figure 1:** Frequency of OMF mass in each year from 2017 to 2021

321 specimens, M: F=1: 0.94 showing male dominance. The age was from one to eighty five years average was 30 year. In the 16-40 years old was maximum age distribution. Benign lesions were common in younger ages, while malignant tumors were more common in elder age. Dysplastic changes were common in younger age (table 1).

| Age group | N (%) |
|---|---|
| ≤15 | 49 (15.3%) |
| 16-40 | 175 (54.7%) |
| ≥ 41 | 96 (30%) |
| Total | 321 (100%) |

**Table 1:** OMF tumors distributions with age group

Table 2 shows OMF masses gender wise distribution, M: F ratio of 1.05: 1, indicating slit an increase of male dominance. Tumors of surface epithelial 19.9% followed by tumor of salivary glands 14.5% and least common is Osseous tumors which are 2.9% in OMF masses.

| Histopathological specimens | Male | Female |
|---|---|---|
| Tumor of odontogenic | 8 | 8 (5.3%) |
| Tumor of salivary gland | 19 | 19(14.5%) |
| Tumors of surface epithelial | 39 | 30 (19.9%) |
| Benign cystic masses | 20 | 20 (12%) |
| Inflammatory samples | 20 | 15 (10.9%) |
| Osseous tumors | 5 | 4 (2.9%) |
| Other mesenchymal tumors | 47 | 63 (34%) |

**Table 2:** OMF mass distribution with sex of the patients in SMC/SGTH

Table 3 and figure 2 shows that at the site of OMF formation, the most common area is the maxillary region 67 (21%), followed by the mandibular region 65 (20%) and buccal mucosa 41 (13%),, the common localization were maxillary site 21.1% and least common in salivary gland tumors, which indicates an increase in maxillary/mandible area dominancy.

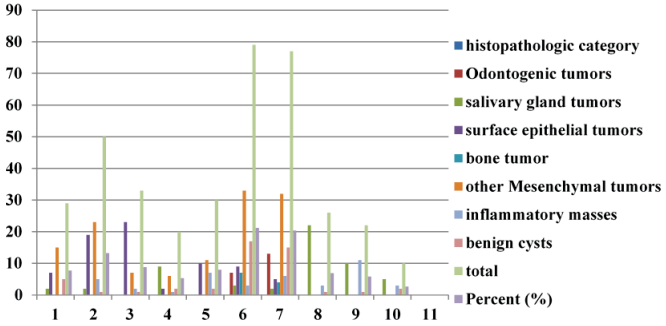


**Figure 4:** Distribution of OMF masses with respect to anatomic site

| Histopathologic category | site of the mass | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | buccal mucosa | tongue | palate | lips | maxillary area | mandibular area | parotid gland | submandibular gland | other salivary glands |
| Dysplastic change | 1 | 1 | 3 | - | - | - | - | - | - | - |
| Inflammatory | 0 | 4 | 2 | 1 | 6 | 2 | 5 | 3 | 9 | 4 |
| Benign masses | 18 | 19 | 9 | 13 | 14 | 51 | 54 | 13 | 7 | 4 |
| Malignancies | 6 | 19 | 14 | 4 | 6 | 17 | 7 | 7 | 2 | 1 |
| Percentage | 7.7 | 13.3 | 8.7 | 5.5 | 8 | 21.1 | 20.5 | 7.2 | 5.6 | 2.7 |

**Table 3:** Histopathological samples of OMF in different anatomic location

## DISCUSSION

The outcomes of the five-year research showed that the number of specimens in the oral cavity and maxillofacial region increased continuously during the last few years. Perhaps this is due to the increase in the quantity and quality of services provided in the pathologist and also in the maxillofacial surgery service of dentistry, an important role is played by the growing state of the health-seeking society [6]. In terms of sex distribution, out of 321 patient specimens, 164 (51%) were male and 157 (49%) female with an M: F ratio of 1.05: 1, indicating an increasing male

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predominance. A similar predominance of men was observed in a teaching hospital in Bangladesh and in a retrospective review conducted in Nigeria and Pakistan in 2014 [6-9]. The age distribution has a least range of less than one year and up to 85 years with a mean of 31 years. The maximum age range of 16-40 years 175 (54%), trailed 41 years old, 96 (30%) and about 16 years 49 (16%) [8]. Among the 11% cases of inflammatory lesions, chronic nonspecific inflammation was the most common in 51.2%, followed by chronic sialadenitis in 41.5%, which was similar to the Taiwanese patient [10]. The same finding was also conducted at St. Paul's Hospital showed that among sarcomas, Kaposi's sarcoma predominates 3.31%, followed by osteosarcoma 1.1% [11, 12]. A comparable description is may be related to the large socio-demographic variation of OMF even within a country, but in different regions. In this study, the most common diagnostic category for OMF was benign tumor 198 (61.6%), followed by benign tumor 83 (26%), then inflammation 35 (11%), and dysplastic changes 5 (1.4%). A study from Nigeria shows a similar result, benign lesions are commonest at 86% and malignant lesions about 14% [9, 11]. However, the results of the Kingdom of Saudi Arabia discussion differed in the predominance of benign diseases (50%) and tumors (50%) [13], and in the case of the Taiwanese patient, diseases of the inflammatory lesions group were the most common. This is followed by reactive diseases similar to tumors [10]. A parallel data was obtained in a retrospective study of pathology of the oral cavity and maxillofacial region in Jeddah with a minimum patient age and mean age of 5 months and 35 years, respectively. [6-8]. and period studies conducted at St. Paul's Hospital also show that the age of the second and third decade is similar to the usual period of presentation's [8, 14]. Hassan et el. demonstrated that, the elder age of the patients with poor prognosis and the malignancy are commonly seen in these ages compare to younger age (avg. 40 year old) benign tumors of the oral cavity in are common Pakistan [12]. Salivary gland lesions were the 2nd commonest tumors of OMF at 15%, and a parallel results were observed in Iraq, where 42.6% were odontogenic tumors and mesenchymal tumors [9, 11] and salivary gland tumors after Nigeria, were in the study of mesenchymal tumors and 37.7% of superficial tumors [15]. But this result is different from the results of a study of the southwestern population of Brazil, in which the tumor of UMF is the most common and has a rate of 37.1% [9, 12, 15]. This study shows that at the site of OMF formation, the most common area is the maxillary region 67 (21%), followed by the mandibular region 65 (20%) and buccal mucosa 41 (13%), and parallel data in a previous study in research. Nigeria [15]. The odontogenic tumors were common in the mandibular region in 65%, then in the maxillary region in 35%, and ameloblastoma was the most common odontogenic tumor in 85%, similar to those in the Mohamebeli National Hospital, Tanzania. In Pakistan the common site for these lesions mandibular area especially for SCC in old elder ages people (9, 11). There are results, study and about the in Ethiopian hospital Odontogenic tumor an 8year retrospective study [16]. Bone tumor severity is 2, 9% with severity 2.9% in Jagami most common Osteosarcoma 2.8% similar finding in Nigeria 11, 7% with osteosarcoma and in Tanzania and Nigeria 3.5% [9, 11, 12]. Benign cysts accounting for 47 (12.5%), the most common dentist was 7 (14.9%) and those in Iraq 37 (22%) was 4.1% followed by radicular cyst 9.5% [17-19]. Among bone diseases, central giant cell tumors were the common, followed by fibro bony tumors. The results were close to the results of earlier studies, on the other hand fibro osseous lesions were commonest than giant cell lesions in these studies. Very few cases were reported in categories of immunological disorders and infections [19, 21].

## CONCLUSIONS

Our study demonstrate the variations of age, sex and location in the oral and maxillofacial masses. The malignant masses are common an elderly aged patients, while the benign are more common an early and middle age people. The commonest malignancy is squamous cells carcinoma while the fibroepethelial polyps are more common in children and youngster.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Frequency of Isolated Optic Neuritis in Cases of Visual Impairment

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## ABSTRACT

Visual impairment can result from various conditions of eye as well as neural pathways that are responsible to transmit visual inputs to the brain. One of the most common of these diseases is termed as optic neuritis which is basically an inflammatory disorder and effects the optic nerve. **Objective:** To find the frequency of the isolated optic neuritis among subjects with visual impairment. **Method:** We conducted an analytical cross-sectional study in the Department of Neurology at the Mayo Hospital. Total 93 subjects fulfilling the inclusion criteria were taken into the study for data collection. All cases underwent visual acuity assessment using Snellen's and near vision charts. Ishihara chart was used to assess color vision along with a fundoscopic examination. Isolated optic neuritis was defined as the presence of one or more of three defects on assessment, i.e., relative afferent pupillary, visual field, and the color vision defect. **Results:** The mean age of patients was 45.45 ± 14.42 years. There were 53.8% male and 46.2% female cases, with a higher male-to-female ratio. Isolated optic neuritis was diagnosed in 24.7% of cases of vision impairment. **Conclusions:** Isolated optic neuritis was diagnosed in almost one-quarter of the patients (24.7%). So, patients presenting with visual impairment must be screened for isolated optic neuritis as optic neuritis is easily distinguished from other diseases affecting the optic nerve by using Snellen's chart and near vision chart and fundoscopic examination and eventually can prevent permanent blindness.

## INTRODUCTION

Visual impairment is a frequently encountered issue in the neurology outpatient department [1]. Visual impairment, eventually leading to permanent blindness, is a serious global public health problem and its prevalence is escalated due to shifting demographics and ageing populations [2, 3]. Globally, the prevalence of moderate to severe near as well as far vision loss was reported as approximately 295 million, and among 258 million mild visual loss was found [4]. In at least half of these cases, vision impairment is preventable, and most visually impaired people belong to developing countries [2]. Visual impairment can occur due to either local eye conditions or disorders of neural pathways carrying signals from the eye to the brain [5]. These conditions include cataract, occlusion of retinal artery and retinal vein, glaucoma, macular degeneration in relation to age factor, nutritional deficiencies, diabetic retinopathy, optic neuropathy, and optic neuritis [4]. The site of involvement and the underlying cause is mainly responsible for various clinical presentations (like mild or moderate impairment and complete blindness) and visual impairment [5]. Symptoms of vision impairment can include blurred vision, decreased color perception, loss of visual fields, and pain that is worsened by eye movement in almost all cases [6]. One

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such inflammatory condition directly related to optic nerve is acute optic neuritis that further poses worse health consequences and complications [7-9]. Most typically, this disorder further aggravates the risk of neurological conditions including the multiple sclerosis (MS) [8, 10]. Optic neuritis presents in approximately 15-20% of cases of MS and manifests in 50% of the cases at some point during their disease [11]. Atypical optic neuritis can be associated with complications due to its inflammatory nature and makes diagnosis a bit tricky as all factors have to be considered well [8, 12]. Dramatic advancements in technology and immunology made it possible to understand the pathology and progress of the disease better especially in the last decade. Doctors can now efficiently examine the structure and function of the optic nerve in the course of inflammatory injury, promptly recognize autoimmune foci relevant to disease, and provide appropriate treatment to ameliorate vision outcomes. In its clinical presentation, Optic neuritis usually is seen in single eye merely. But in around 10% subjects, it can occur in both eyes [13]. Vision loss usually occurs over hours to days, rising to peak within one to two weeks [11]. In Optic Neuritis Treatment Trial (ONTT), more than 90% of cases reported a remarkable decline in central visual acuity [14]. A study reported that the frequency of isolated optic neuritis was found in 19% of cases of neurogenic vision loss in neighboring countries [5]. Functional vision is restored within one year in most optic neuritis patients. However, most patients present deficits in color vision, contrast sensitivity, stereo acuity, and light brightness on testing for up to two years [11]. Aim of this study was to see the frequency of the isolated optic neuritis in cases of visual impairment in the Pakistani population, as no local study has been done so far. Also, there is either lack of awareness or under-diagnosis of optic neuritis, resulting in delayed diagnosis and management, often leading to permanent disability. Global data is also not widely published, and an amiable study reported a high percentage of isolated optic neuritis in vision impairment [5]. Epidemiology of vision loss is constantly increasing, and most of these cases remain undiagnosed for isolated optic neuritis. Evaluating patients with neuro-ophthalmic symptoms can help design appropriate diagnostic and therapeutic strategies in the future.

## METHODS

We conducted an analytical cross-sectional study in Neurology department of Mayo Hospital. The sampling technique used to collect data was non-probability consecutive from 93 cases estimated using a percentage of isolated optic neuritis as 19% in cases of vision loss. [5] 8% margin of error (absolute precision) and 95% confidence level were used. Patients aged 15-70 years of either gender who had acute (develop over several minutes to hours), sub-acute, or chronic (few days to weeks or months) visual impairments were included in the study. Patients with all other local ophthalmological causes as well as neurological causes, such as glaucoma, cataract, occlusion of retinal artery or vein occlusion, optic neuropathic, neuromyelitis optical spectrum, malnutrition and multiple sclerosis contributing to visual impairment, were all put in exclusion. After taking informed consent, all cases underwent visual acuity assessment using Snellen's and Near vision charts. Fundoscopy was used for examination and Ishihara chart was used for checking the color vision by a consultant ophthalmologist conducted a reassessment to confirm the diagnosis. Isolated optic neuritis was defined as the presence of one or more of three defects on assessment, i.e., afferent pupillary, color vision and visual field defect. For quantitative data, mean ± standard deviation was used, whereas for qualitative variables, frequency (percentages) was used. Data were stratified for age, gender, visual acuity and duration of visual loss (Acute, sub-acute, chronic). Post-stratification Chi-square test was applied by considering p-value<0.05 as significant.

## RESULTS

The average age of 93 patients was 45.45 ± 14.42 years (Range= 55 years). Overall, there were 50(53.8%) male and 43(46.2%) female cases, with higher male-to-female ratio. The average disease duration was 9.04 ± 5.33 weeks, with minimum and maximum duration of 1 and 20 weeks. The baseline characteristics of study respondents are given in table 1.

**Table 1:** Baseline characteristics of study respondents (N=93)

| Parameters | | N (%) |
|---|---|---|
| Age* (years) | | 45.45 ± 14.42 |
| Gender | Male | 50(53.8) |
| | Female | 43(46.2) |
| Duration of disease* (weeks) | | 9.04 ± 5.33 |

n=Number of Participants; %=Percentage of Participants; *=Continuous data reported as mean ± standard deviation

Isolated optic neuritis was found in 23(24.7%) cases of visual impairment (Figure I).

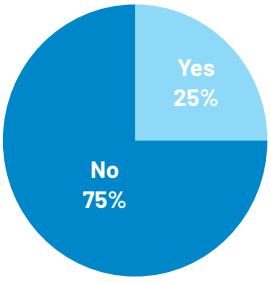


**Figure 1:** Distribution of Isolated Optic Neuritis

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When data were stratified for age, gender, and visual acuity, the frequency of isolated optic neuritis was statistically the same in each stratum (p>0.05). upon stratification of data with respect to the severity as well as disease duration, the frequency of isolated optic neuritis was statistically significant in cases with duration ≥ 4 weeks (p = 0.032) and in cases having sub-acute and chronic visual loss (p = 0.032) (Table 2).

**Table 2:** Comparison of isolated optic neuritis for age groups, gender, duration of disease, visual loss, and visual acuity

| Parameters | | Isolated Optic Neuritis | | p-Value* |
|---|---|---|---|---|
| | | Yes | No | |
| Age Groups (Years) | 15-40 | 5(16.1%) | 26(83.9%) | 0.174 |
| | 41-70 | 18(29.0%) | 44(71.0%) | |
| Gender | Male | 15(30.0%) | 35(70.0%) | 0.204 |
| | Female | 8(18.6%) | 35(81.4%) | |
| Duration of disease (weeks) | ≤ 1 | 5(35.7%) | 9(64.3%) | 0.032 |
| | 4-8 | 10(40.0%) | 15(60.0%) | |
| | >8 | 8(14.8%) | 46(85.2%) | |
| Visual loss | Acute | 5(35.7%) | 9(64.3%) | 0.032 |
| | Sub-acute | 10(40.0%) | 15(60.0%) | |
| | Chronic | 8(14.8%) | 46(85.2%) | |
| Visual Acuity a | 6/18 | 11(21.6%) | 40(78.4%) | 0.436 |
| | Worse | 12(28.6%) | 30(71.4%) | |

*Chi-square test was used to calculate the result, and a p-value <0.05 was taken as significant

## DISCUSSION

Vision is a natural blessing, imperative for proper functioning of human being. Hence, its loss impairs normal daily activities and put a drastic effect on quality of life of patients, overall socio-demographic dynamics, and health burden. As stated in a Global Burden of Disease (GBD) study in 2015, among all-ages risk factors of Years Lived with Disability (YLDs), sensory organ loss, which inevitably includes vision loss/ blindness came just after neck and back pain holding second position and even before the depressive symptom [15]. Whereas, among patients above the age of 65 years, it topped the list [16]. All recent studies conducted globally, including up to date systematic reviews and meta- analysis have reported that a significant number of patient is affected with visual impairment that includes up to 32.4 million persons who are reported in 2010 as complete blind (< 3/ 60), as well as 191million persons having moderate-severe vision loss [17]. The incidence of acute optic neuritis has been reported as almost 1 – 5 in 100,000 persons per annum among otherwise healthy population [18]. When studied for risk factors, under correction of the refractive errors and cataracts topped the list while other reasons such as macular degeneration, glaucoma, isolated optic neuritis, and diabetic retinopathy constituted in 25% of all risk factors [19]. Typical optic neuritis has a very severe prognosis, is acute in nature and has difficulty in making diagnosis because of its complicated properties. Most of the times, it happens due to a reaction against the optic nerve and may aggravate into other issues such as multiple sclerosis [20]. Optic neuritis is more prevalent at the young age group (15-45 years) [20, 21]. The average age in this study was found as 45.45 ± 14.42 years, as correlated with the previous literature. Optic neuritis is found to be more prevalent in females than males by a ratio of 3:1 to 4:1 [11, 18]. But in the present study, there were 50(53.8%) male and 43(46.2%) female cases, with a higher male-to-female ratio. This could be due to the small sample size and can be overcome by increasing the sample size. Central visual loss has been reported in almost 90% patients having optic neuritis [21]. A prospective cohort study was conducted that focused on properties and outcomes among a number of visual disorders on 64 persons having optic neurogenic issues. These patients were followed up for 6 months. Study reported that 40 and 10 persons showed problem due to the anterior visual pathways and cortical loss. Out of 64 patients, 12(19%) had isolated optic neuritis as a cause of vision impairment; this frequency is lower than the reported frequency in the current study. Many of them had severe intensity of visual problems [5]. While another study showed that among all patients with neurological diseases, the optic neuritis constituted for 43% [22]. The current study diagnosed isolated optic neuritis in 23(24.7%) and 70(75.3%) cases. Isolated optic neuritis was not found.

## CONCLUSIONS

Isolated optic neuritis was diagnosed in almost one-quarter of the patients (24.7%). So, patients presenting with visual impairment must be screened for isolated optic neuritis as optic neuritis is easily distinguished from other diseases affecting the optic nerve by using Snellen's chart and near vision chart and fundoscopic examination and eventually can prevent permanent blindness.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Emotional Recognition of Children with Down Syndrome and Normally Developing Children: A Comparative Cross-Sectional Study

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## ABSTRACT

Psychologists have tried to explain emotions since centuries ago they have tried to identify different types of emotions. Emotions are basically mental experiences that can lead to pleasant or unpleasant moods. Emotions influence our perception and social communication. For Down Syndrome being social can also be determined by emotional recognition. It plays an important role for social interaction which is recognized by emotions and helps them to regulate it for social interaction. Basic emotions which are included in this study are happiness, sadness, and aggressive facial expressions. **Objective:** To determine the level of emotional regulation through emotional recognition by facial expressions in down syndrome compared to normally developing children. **Methods:** This was a comparative cross-sectional study. Emotional Recognition Questionnaire Version 7-6/2012 was used. Data on children with down syndrome were collected from special education centres of Lahore and data on normally developing children was collected from the private schools by using standardized tools. The total sample size was 384 calculated by using an online calculator. Data were analyzed using SPSS 21. **Results:** The results showed that people with down syndrome were good at identifying emotions of happiness, sadness, anger, and worry when compared with normally developing children. Their ability to recognize facial expressions helps down syndrome children for socialization. **Conclusions:** It was concluded that children with down syndrome can recognize and regulate emotions and emotion of happiness is more easily recognized than the other emotions when it was compared to normally developing children.

## INTRODUCTION

Emotions are mental experiences that can lead to pleasant or unpleasant moods. Emotions influence our perception and social communication. Emotional intelligence is the ability of a person to function purposefully and to communicate with others in a socially acceptable manner [1]. Emotional recognition is a subgroup of emotional intelligence it is an individual's ability to express and control emotions. Down syndrome disorder is a chromosomal disorder that occurs in 1 in 1800 to 1000 live births approximately. Down syndrome children show more strength in social functioning and they use social skills to compensate for their weaker domains [2]. Down syndrome, children use emotional regulation for their social competence. For being social Down syndrome children are mostly described as "cheerful" and "generous" as compared to other syndromes. Down syndrome children usually have fewer behavioral problems. It is also evident that cognitive, social, linguistic, and emotional phenotypes of down syndrome children are already emerging in the early years of their life [3]. Down syndrome is a chromosomal disorder that results in an additional and partial copy of chromosome 21. Down syndrome children have different features, they have a small head, face, ears, flat nasal bridge, and outward inclined eyes [4]. There are four types of Down syndrome and among them, trisomy 21 has a 94% chance [5]. The children born with Down syndrome are typically increasing in the world and it is also linked with the mother's age. For emotional recognition, the parents who

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show more emotional involvement for their children during playtime have better cognitive functioning for emotional recognition. Down syndrome children can recognize anger, fear, and happiness [6]. Emotions are central to human functioning from birth to death. In human life importance of emotions cannot be denied because the saturation of thoughts depends upon emotions. Social and cognitive development also depends upon emotions [7]. Emotional regulation involves the management and organization of our neurological, cognitive, facial, and behavioral systems. For social interaction, emotional understanding plays an important role. It is clear that down syndrome children can recognize happy, sad, and angry emotions. Emotional perception was examined by facial expressions and cognitive emotion regulation [8-10]. It is studied that interest and friendliness depend upon emotional knowledge. Down syndrome children can recognize and respond to emotions very well.

## METHODS

The comparative cross-sectional survey was conducted from January to June 2018. The study was six months long. This is a quantitative research and convenient sampling technique was used and research data were collected from Lahore by using standardized questionnaire. For Down Syndrome Children data were collected from different special education centres of Lahore. For normal children data were collected from private schools. Consent form was filled out by the institutes. Data were collected from both down syndrome and normally developing children by using standardized tool. The Inclusion Criteria for this research was down syndrome, mild to moderate mental level, IQ Level Pre diagnosed by Psychologist and their age range may be between 4 to 13 years. Exclusion Criteria was down syndrome children having other co-morbid conditions. The parents were taken under confidence and a consent was filled out to keep ethical values a step ahead and it was assured that their personal information was remain confidential. The total sample was 384 calculated through online calculator by using level of Significance 95% and 5 % Confidence Interval. Convenient Sampling Techniques was used in this research. Down syndrome Mild to Moderate mental level was selected for research. The IQ Level of Down syndrome was Pre diagnosed by Psychologist for research. Age range between 4 to 13 years for Down syndrome was selected for conduction of study. Emotional Recognition Questionnaire Version 7-6/2012 was used. The SPSS 21.0 was used to analyze data statistically. The study was based upon interpretation and analysis of the data. For the analysis Quantitative Research approach was used the t-test was applied. The nature of the data was quantitative.

## RESULT

The objective of the study was to determine the level of emotional regulation through emotional recognition of different facial expressions which was based upon recognition of emotions like happiness, fear, sadness, anger and scared in down syndrome children as compared to normally developing children [8]. Figure 1 shows the gender distribution. 250 were down syndrome males and 237 were normally developing male and 134 were down syndrome females and 147 were normally developing females participated in this study.

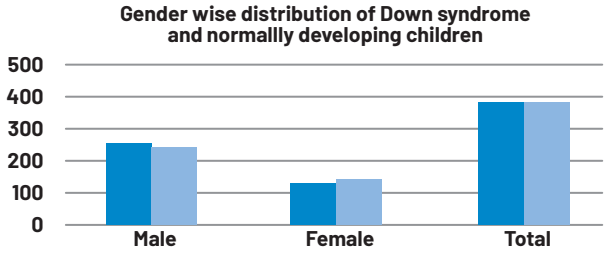


**Figure 1:** Gender of Participants (Down syndrome and normally developing Children)

This Figure 2 showed that between 4-8 years the frequency was 66 and 17.2 % participants fall in this age range and answered the questions while 9-13 years of age range had frequency of f = 318 at 82.81% which showed that most of the participants were in age range between 9-13 years. Down syndrome children mostly fall between age range of 9 -13 years at p vale 0.005 which is significant.

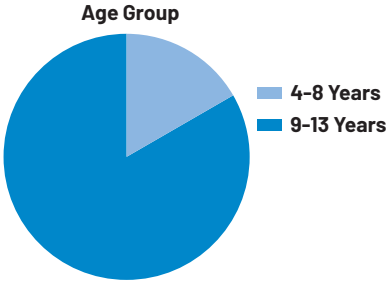


**Figure 2:** Age group of the Participants (Down syndrome and Normally Developing Children)

Table 1 showed that Down Syndrome children aged between 4-8 years that selected emotions of happiness were 268 which shows the frequency of selecting emotion of happiness is 69.8% and 73 participants had chosen sad emotion with a frequency 19.0%. Emotions of anger was selected at the frequency of 6.0% and emotions of scared was selected at the frequency of 5.2% which is significant at a=0.05.

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**Table 1**: Frequency of responses by Participants (Down syndrome and normally developing Children)

| Options | Frequency (%) of Down Syndrome Children | Frequency (%) of Normally developing Children |
|---|---|---|
| Happy | 268 (69.8%) | 270 (73.0%) |
| Sad | 73 (19.0%) | 71 (14.0%) |
| Scared | 20 (5.2%) | 20 (7.0%) |
| Angry | 23 (6.0%) | 23 (6.0%) |
| Total | 384 (100%) | 384 (100%) |

## DISCUSSION

This research was conducted to explore the cognitive emotional regulation of Down syndrome children by recognition of facial expressions because facial expressions play an important role in recognition of emotions [11]. In Down Syndrome Children the facial expression was used to identify emotions by a pictorial questionnaire. The result showed significant values p= 0.05 level of significance. The down syndrome children was good in identifying emotions of Happiness, sadness, anger, worry, scared. Down syndrome children can recognize emotions by facial expressions and results showed that down syndrome are good in recognizing happiness and anger [12]. In this study four emotional expressions are used which include happy, sad, scared and anger facial expression [13]. This study contributes to the literature on the emotional regulation of Down syndrome children. It helps to understand the early emotional development of Down syndrome children. Several findings from this study are notable, first emotional recognition by facial expressions for regulating cognitive mapping and perceptions of emotions for down syndrome children. Perception of emotions helps them to be more social [14]. For down syndrome children perception of emotions compared to normally developing children is 268 times 69.8% for emotion of happiness which was recognized by using questionnaire. For the emotional regulation the Down syndrome had mean percentile in the 62$^{nd}$ percentile was (SD=21.26) whereas for comparison group for 52$^{nd}$ percentile(SD=27.68). Both groups showed similar emotion regulation performance [15]. The scores suggest that better emotional recognition helps Down syndrome children to be more socially oriented. It is suggested that individual with Down syndrome overuse their social skills to compensate for their weaker domains of functioning [16]. Findings suggest that Down syndrome children can recognize happy and sad emotions 268 at 69.8%. It was also noted the happy and sad expressions are mostly answered rather than scared and worried. Down syndrome children are social with others during their routine conversation which also impacts positively upon their choosing emotion. Studies have reported that Down Syndrome children have difficulties in recognizing emotions however they can discriminate between happy and sad emotions. This research was aimed to assess that down syndrome children are as good as normally developing children in recognizing emotions [17]. In the self-regulation of children with down syndrome, development of language and communication plays an important role. The self-regulation is a broad term which encompasses the ability to control behavior and adaption to variety of dimensions including emotion and cognition. For the self-regulation of down syndrome emotional recognition is vital in this research it was found out that emotional regulation is connected with emotional recognition by facial expressions [18]. In a research comprehension of emotion, abstract and concrete are compared with normally developing children it was found out that Down syndrome children shows no emotion lexicon deficient they can easily comprehend emotions. Emotion of happiness is more easily comprehended by them [19]. The social domain includes emotions and emotional regulation in Down syndrome. It plays an important role in regulatory function of Down syndrome emotional regulation which supports the children's social abilities and also provides a critical support for advance social functioning. Cognitive performance was selected as relative indicator for emotional regulation the analysis demonstrated that $p<0.005$ which shows that emotions are relative for cognitive development [16]. For the behavior adaptation emotional perception was compared to that emotional perception that plays a vital role for emotional regulation in early development of children with Downs syndrome [19]. Emotional vocabulary makes it easier for typically developing children to identify emotions as compared to Down syndrome it was measured on basic emotions which includes happiness, disgust, surprise and fear. It was analysed that cognitive mapping was prompt by emotional vocabulary of emotions. It was found out that extensive vocabulary of emotions enhances the chances of children and adults with down syndrome to become emotionally competent in their early development of social interactions [20].

## CONCLUSIONS

It was concluded that children with Down syndrome's emotional recognition process for emotion of happiness is more than the other emotions when it was compared to normally developing children.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# The Role of ICT Self-Efficacy as Moderator in Relationship between Self-Directed Learning, with E-Learning Readiness and Student Engagement

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## ABSTRACT

The COVID-19 pandemic forced institutions and organizations to adopt remote work policies, leading to numerous challenges for individuals, especially students. Thus, it is vital to examine the e-learning environment and the factors influencing the e-learning process to better comprehend and address the challenges students face in this context. **Objectives:** To explore the moderating role of ICT-SE in the relationship between SDL, ELR, and SE among adolescents. **Methods:** A convenience sampling technique was employed to select a sample of 300 school, college, and university students aged 15 to 21 years, including both boys and girls, from Rawalpindi and Islamabad. Reliable measures were used to collect data on the variables studied, including ICT self-efficacy, self-directed learning, e-learning readiness, and student engagement. **Results:** The study's findings revealed a positive correlation between self-directed learning, e-learning readiness, and student engagement. Additionally, e-learning readiness and student engagement exhibited a significant positive correlation. The study also discovered that ICT self-efficacy significantly moderated connection among self-directed learning and e-learning readiness, as well as between self-directed learning and student engagement. **Conclusions:** The study's findings suggest that promoting students' self-directed learning and e-learning readiness may result in improved engagement in e-learning environments. The study also emphasizes the significance of ICT self-efficacy in strengthening the relationship between SDL and SE. These results have implications for enhancing e-learning quality in Pakistani educational institutions by focusing on these factors.

## INTRODUCTION

The utilization of ICT has become a crucial component in various industries, hospitals, and educational institutions worldwide in the 21st century. However, it was not until the onset of the COVID-19 pandemic that the usage of ICT gained attention in underdeveloped countries like Pakistan. Initially, many students from these countries were unfamiliar with this new mode of learning. Thus, this study aims to investigate the relationship between SDL, ELR, and student engagement, and the moderating effect of ICT self-efficacy (ICT-SE) in this context. The research provides fresh insights and examines these connections in the local context of Pakistan, given the significance of self-directed learning in producing positive outcomes as highlighted in previous literature. The current study's variables are detailed as follows: Self-Directed Learning (SDL) is considered a process in which individuals of any age, with specific goals, seek skills (motivation, self-control, monitoring, and management) to acquire information and outcomes [1]. A recent study suggested that individuals with SDL abilities demonstrated strong determination in performing online tasks [2]. Student Engagement (SE) is the degree to which a learner exerts mental, emotional, and behavioral efforts towards academic activities to achieve maximum results [3]. It is considered an essential outcome in learning and teaching, especially in e-learning environments [4]. E-Learning Readiness (ELR) is a self-directed activity and defined as the student's mental preparedness for learning online

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tasks on time [5]. Researchers have argued that e-learning readiness plays a crucial role in successfully implementing e-learning academic tasks for both teachers and students [6, 7]. Several studies have shown a positive correlation between self-directed learning and student engagement. For example, a study examining a sample of 333 undergraduate and graduate students from Saudi Arabia discovered a positive correlation between self-directed learning and student engagement while using smartphones for learning [8-11]. Furthermore, empirical evidence suggests that students with self-directed learning skills are mentally prepared for online learning activities [12-14]. Additionally, existing literature has also highlighted the positive relationship between e-learning readiness and student engagement. For instance, Prihastiwi *et al.*, and Ismail investigated the predictive role of e-learning readiness in student engagement among a sample of 125 students and teachers from various faculties, including psychology, law, and education. The study findings revealed a significant positive impact of e-learning readiness on student engagement [15, 16]. ICT Self-Efficacy refers to an individual's perception of their expertise in executing computer and internet-related tasks and assignments [17]. According to theorists, students with a high level of ICT self-efficacy are better able to engage with the e-learning environment. This is because such learners have a strong belief in their ability to adapt to the learning situation and overcome challenging conditions, rather than ignoring them [18-20]. Moreover, ICT self-efficacy was also found to be a significant predictor of e-learning readiness [7, 21, 22]. For example, Owusu-Agyeman et al. found that ICT self-efficacy moderated the relationship between online learning and student engagement [23, 24]. Latip *et al.*, discovered that self-efficacy played a moderating role in the relationship between performance expectancy and e-learning acceptance [25]. Based on these findings, it can be assumed that ICT self-efficacy plays a positive moderating role in both e-learning readiness and student engagement.

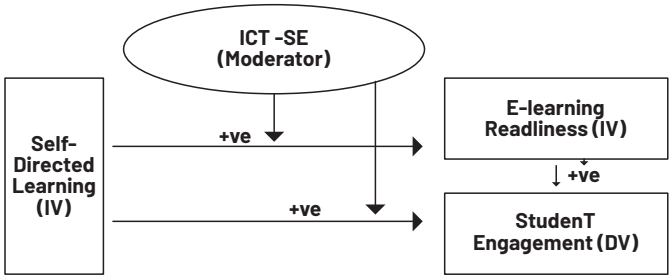


**Figure 1:** Proposed model.

## METHODS

A positive relationship exists among SDL, ERL, and SE. ICT self-efficacy serves as a moderator between self-directed learning and e-learning readiness. ICT self-efficacy acts as a moderator between self-directed learning and student engagement. In this study, a cross-sectional research design was employed. A sample of 300 adolescents was selected through convenient sampling from various schools, colleges, and universities in the twin cities of Rawalpindi and Islamabad during the period of 2020-2022. The participants' age range was between 15 and 21 years. Students who were suffering from mental illness and had not attended online classes were excluded from the sample. Before conducting the study, the researchers obtained prior permission from the competent authorities and participants of the academic institutions. Four reliable instruments were used for data collection: SDL with Technology Scale, E-Learning Readiness Scale, Student Engagement Scale in E-Learning Environment, and ICT Self-Efficacy Scale [26-29]. After collecting the data, the researchers expressed gratitude to the participants for their cooperation in the study. Data analysis, including descriptive, correlational, reliability, and regression analyses, was performed using SPSS-21. Mean ± SD was calculated for quantitative variables and frequency and percentages for Qualitative variables. Correlation was conducted to see the relationship among study variables. p-value less than 0,05 was considered as significant.

## RESULTS

Table 1 shows descriptive statics and alpha reliability coefficients of the study variables on samples of study variables (*N*=300). The normality assumption for regression analysis was met as evidenced by the acceptable range of Skewness and Kurtosis values falling between -1 and +1.

**Table 1:** The descriptive statics and Alpha Reliability Coefficients of the Study Variables (n=300)

| Variable | n | Mean ± SD | A | Range | | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| | | | | Actual | Potential | | |
| ICTSE | 23 | 87.68 ± 16.87 | .95 | 27-115 | 23-115 | -.65 | .35 |
| SDL | 6 | 26.64 ± 5.99 | .85 | 6-36 | 6-36 | -.75 | .09 |
| ELR | 17 | 82.73 ± 15.44 | .90 | 34-119 | 17-119 | -.49 | .25 |
| SE | 24 | 77.32 ± 18.85 | .91 | 24-120 | 24-120 | -.38 | .15 |

The table 2 demonstrates that all the variable of study is positive correlated with each other at (p<.001). The correlation values range from 0.45 -0.71.

**Table 2:** Inter scale correlation for SDL, E-learning Readiness, and SE (n=300)

| Variable | SDL | ELR | SE | ICT- SE |
|---|---|---|---|---|
| SDL | – | .71*** | .59*** | .67*** |
| ELR | | – | .58*** | .66*** |
| SE | | | – | .45*** |
| ICT-SE | | | | – |

Table 3 demonstrates the impact of ICT self-efficacy as a moderator on the association among SDL and SE. The

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model was statistically significant with an R2 value of .35 and an F-test of (3, 296) = 54.23, p < .000, indicating that self-directed learning had a positive effect on student engagement, and ICT self-efficacy played a significant moderating role in the relationship between SDL and SE.

**Table 3:** Moderation Analyses of ICT Self-efficacy as a Moderator between Self-directed Learning and Student Engagement (n=300)

| Predictors | Estimate | St. Error | 95% CI | | t | p-value |
|---|---|---|---|---|---|---|
| | | | LL | UL | | |
| SDL | 1.81 | .20 | 1.41 | 2.20 | 8.99 | 000 |
| ICTSE | .12 | .07 | -.02 | .25 | 1.72 | .087 |
| SDL x ICTSE | .03 | .01 | .01 | .04 | 3.37 | .000 |

Table 4 presents the moderating effect of ICT self-efficacy on the relationship between self-directed learning and e-learning readiness. The overall model was statistically significant, with R2 = .56, F (3, 296) = 125.95, p < .001. Self-directed learning exhibited a significant and positive association with e-learning readiness, and ICT self-efficacy significantly moderated this relationship between self-directed learning and e-learning readiness.

**Table 4:** Moderation Analyses of ICT Self-efficacy as a Moderator between Self-directed Learning and E-learning Readiness

| Predictors | Estimate | St. Error | 95% CI | | t | p-value |
|---|---|---|---|---|---|---|
| | | | LL | UL | | |
| SDL | 1.32 | .13 | 1.05 | 1.58 | 9.816 | 000 |
| ICTSE | .31 | .05 | .22 | .40 | .772 | .000 |
| SDL x ICTSE | .01 | .01 | .00 | .02 | .62 | .009 |

## DISCUSSION

The objective of this study was to explore the moderating role of ICT self-efficacy in the relationship between SDL, ELR, and SE. Table 1 revealed that the alpha reliability coefficients for all four research variable instruments were satisfactory and within an acceptable range. Furthermore, the data exhibited normal distribution. The findings for alpha values satisfied the criteria for an acceptable range of alpha values, as outlined by Nunnally and Berstein, which are above 0.6 to 0.7, respectively [30] (Table 1). The study's first hypothesis proposed a positive relationship between SDL, ELR, and SE. The results demonstrated that all variables were significantly and positively correlated with each other, as displayed in Table 2. The results indicated that students possessing robust self-directed learning abilities exhibited higher levels of commitment and motivation within the e-learning environment, resulting in increased student engagement [2]. These findings are consistent with those reported in previous studies [12, 13, 21, 31, 32]. The study's second and third hypotheses were designed to investigate the moderating role of ICT self-efficacy in the relationship between self-directed learning and student engagement. The findings confirmed the moderating impact of ICT self-efficacy on both self-directed learning and student engagement, as well as on e-learning readiness (Table 4). The results implied that adolescents with higher ICT self-efficacy and self-directed learning are more likely to be engaged in e-learning environments [23, 24]. Similarly, the Mushtaque *et al.*, findings also suggested that students with greater ICT self-efficacy and more self-directed learning are better prepared for e-learning [25, 33].

## CONCLUSIONS

The aim of this study was to examine how ICT self-efficacy affects the relationship between SDL, ELR, and SE among Pakistani youth. The study found that these variables were positively associated and that ICT self-efficacy played a moderating role in their relationships. The outcomes emphasized the significance of ICT self-efficacy in promoting e-learning readiness and student engagement for Pakistani youth in an e-learning setting.

## Conflicts of Interest

The authors declare no conflict of interest.

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**Original Article**

# Frequency, Age, Gender Distribution, and Seasonal Variation of Guillain-Barre Syndrome in a Province of Pakistan: A Retrospective Study

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## ABSTRACT

Characterized by the sudden onset of muscle weakness, Guillain-Barré Syndrome (GBS) is a rare autoimmune disorder which can progress to paralysis. GBS has different subtypes based on the clinical and electrophysiological characteristics, including acute inflammatory demyelinating polyradiculoneuropathy (AIDP), axonal GBS (AMAN and AMSAN), and Miller Fisher Syndrome (MFS). **Objective:** To study frequency of the disease in Khyber Pakhtunkhwa. **Methods:** In this retrospective study, medical records of 39 patients diagnosed with GBS at Lady Reading Hospital Peshawar, Pakistan, were analyzed to determine the prevalence of GBS subtypes in the country. **Results:** The results showed that the most prevalent subtype of GBS was AMAN, accounting for 59% of cases, followed by AMSAN at 25.6%, and AIDP at 15.3%. The axonal variety made up 84.6% of the total GBS cases in this study. On average, the patients with AMSAN were 39.2 years old, while patients with AMAN and AIDP were relatively younger, with mean ages of 30 and 28 years, respectively. There was a male predominance in all subtypes except for AIDP, which showed equal distribution. **Conclusions:** These findings provide valuable information on the distribution of GBS subtypes in Peshawar, Pakistan, which may have implications for the diagnosis and management of GBS in the country. Additionally, the study's results can contribute to the global understanding of GBS epidemiology and may help improve the diagnosis and treatment of GBS patients worldwide.

## INTRODUCTION

Affecting the peripheral nervous system, GBS is a rare autoimmune disorder that has the potential to be life-threatening. It also affects the peripheral nervous system, causing muscle weakness, numbness, and in severe cases, paralysis [1]. The pathophysiology of GBS involves the immune system attacking the myelin sheath that surrounds the nerves, leading to demyelination and axonal damage [2]. Electrophysiological studies have been instrumental in comprehending the underlying mechanisms of GBS and in diagnosing and monitoring the disease [3]. Nerve conduction studies (NCS) and electromyography (EMG) are commonly used to assess the severity and distribution of nerve damage in GBS [4]. GBS is a worldwide disease with a reported incidence ranging from 0.4 to 4 cases per year for every 100,000 population [5]. However, the prevalence of GBS varies across different regions and populations [6]. Various reports have suggested that genetic, environmental, and infectious factors may play a role in the variability in GBS prevalence [7-9]. GBS has been associated with various infectious agents, including *Campylobacter jejuni*, cytomegalovirus, and Zika virus [10, 11]. Additionally, the implication of the pathogenesis of GBS has been attributed to the presence of specific antibodies against gangliosides [12, 13]. Understanding the epidemiology of GBS is crucial for effective management and prevention strategies [9]. Recent efforts have been made to refine the diagnostic criteria for GBS, including the development of the Brighton criteria and the GBS Classification Group criteria [14]. Treatment options for GBS include immunomodulatory

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therapies, such as intravenous immunoglobulin and plasma exchange, which have been shown to improve outcomes in patients [3, 15].

## METHODS

Neurophysiological data of patients diagnosed with GBS and referred to the Neurophysiology Department at Lady Reading Hospital in Peshawar over a year-long period was collected. Specifically, we retrospectively analyzed the data from September 2017 to August 2018. The data about the age, sex and season of illness were also obtained. All these patients underwent a Standard Electrodiagnostic study utilizing surface electrodes and simulator for NCS. Standard antidromic sensory and motor NCS were performed. Median, ulnar and sural sensory nerves were selected whilst median, ulnar, tibial and peroneal nerves were selected for motor studies. Standard parameters including amplitude, compound muscle action potential (CMAP), distal latency, nerve conduction velocity (NCV), conduction block (CB), and temporal dispersion (TD) were measured. In sensory nerves, sensory nerve action potential (SNAP) and peak latency with NCV were evaluated. After reviewing the medical record of the GBS patients, patients with normal (n = 3) or near normal (n = 1) electrophysiological results were excluded. Patients with miller fisher syndrome and pure sensory axonal neuropathy were also excluded. Three groups were formed to classify the cases: AMAN, AIDP and AMSAN. Albers and Kelly criteria was used to diagnose AIDP [6].

## RESULTS

The study comprised 39 patients, out of which, 26 (67%) were male and 13 (33%) were females. The mean age was 31.82, with a minimum age of 15 years and the maximum being 60 years. Based on electrodiagnostic criteria, 39 patients were grouped into AMAN (n=23, 59%), AMSAN (n=10, 25.6%) and AIDP (n=6, 15.3%) (Figure 1).

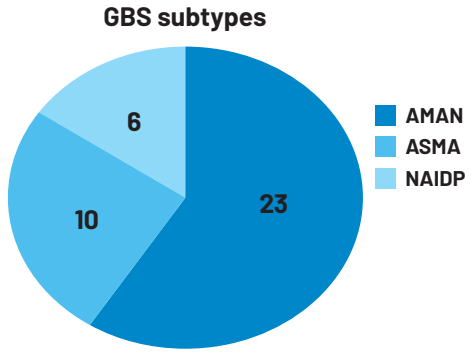


**Figure 1:** Pie chart showing frequency of GBS subtypes: AMAN, AMSAN, and AIDP

Patients with the AMAN group had reduced CMAP amplitudes with normal SNAPs. The results of median nerve conduction study among the different subtypes of GBS are summarized in Table 1. Patients with AIDP show prolonged distal motor latencies and slower conduction velocities compared to AMAN. The CMAP amplitudes are almost same in the two groups. Three AIDP patients showed conduction block and abnormal temporal dispersion. AMAN patients showed greater SNAP amplitudes. Four of the AIDP patients showed abnormal sensory nerve conduction which was normal in all the AMAN patients (Table 1).

**Table 1:** Comparison of means of Median nerve conduction study in patients with AMAN and AIDP

| Motor | AMAN | AIDP |
|---|---|---|
| Distal latency (ms) | 3.08 | 5.83 |
| Conduction velocity (m/s) | 50.32 | 35 |
| | | |
| CMAP Amplitude (mV) | 3.04 | 2.9 |
| Sensory | - | - |
| Conduction velocity (m/s) | 60 | 43.2 |
| SNAP Amplitude (uV) | 31.24 | 19.2 |

Out of 39 patients, 26 (67%) were male and 13 (33%) females. Table shows the subdivision of different types of GBS based on gender. Among the AMAN group, 65% were male, 35% female. In AMSAN group, 80% were male and 20% female. In AIDP subtype, male and female were 50% each (Figure 2).

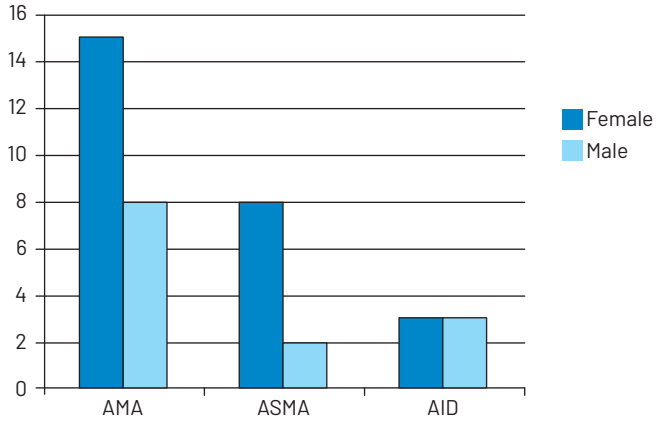


**Figure 2:** Gender wise distribution of subtypes of GBS

The mean age was 32, with a minimum age of 15 years and the maximum being 60 years. Table 2 shows age wise division of GBS subtypes. Among the AMAN group, the mean age was 30, AMSAN 39 and AIDP 28 years of age (Table 2).

**Table 2:** Age wise distribution of GBS subtypes

| | Motor | AMAN | AIDP |
|---|---|---|---|
| All patients | 30 | 39.2 | 28 |
| Male | 29 | 39 | 28 |
| Female | 31 | 40 | 28 |

Seasonal preponderance was found. 13 (33%) cases were diagnosed in spring (March to May), 12 (31%) in autumn (September to November), 7 each in (18%) in summer (June

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to August) and winter (December to February) (Figure 3).

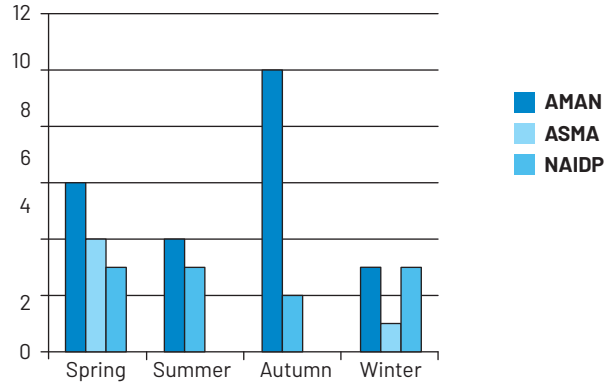


**Figure 3:** Seasonal variation of GBS subtypes

## DISCUSSION

In our study, we evaluated 39 patients with Guillain-Barré Syndrome (GBS). There were twice as many males as there were females (2:1), which is in line with previous studies indicating a higher incidence of GBS among males [16]. On average, the patients were 31.8 years at the time of onset, which is relatively young compared to the increasing incidence of GBS with age observed in North America and European countries [17]. In terms of GBS subtypes, male predominance was observed in both AMAN and AMSAN groups. However, among AIDP patients, the male to female ratio was 1:1. Patients with AMSAN had a higher mean age compared to other forms, while AMAN and AIDP had a lower mean age. These findings correlate with previous studies, which demonstrated an increased incidence of AMSAN in the aged population [18]. In terms of age, there was no significant difference between genders among GBS subtypes. GBS is a heterogenous disorder with several subtypes, including AIDP, AMAN, and AMSAN [19]. The subtypes exhibit striking geographical variation, with AIDP more common in Europe and North America (69% demyelinating vs. 3% axonal, 23% equivocal) [20]. In our study, axonal variants (AMAN followed by AMSAN) were more frequent than the demyelinating pattern. Thus, the frequency of axonal-type GBS in Khyber Pakhtunkhwa is comparable to that reported in other Asian countries such as Iran, India, China, and Japan [18-21]. Jacobs *et al.*, reported 31% axonal vs. 46% demyelinating in Pakistan, and our study also found a higher frequency of the axonal variant compared to the Western population. There is also seasonal variation in GBS, with clustering of cases observed in autumn and spring in our study (64% of the total cases, mostly axonal variants). This is likely due to the increased frequency of viral and upper respiratory infections during these seasons. One study conducted in Iran showed increased prevalence in autumn and winter [18]. The difference in seasonal variation may be since cases sought opinions in different tertiary care hospitals. Thus, to determine the precise seasonal variations of GBS, multicentre studies are required. In a study by Ansari *et al.*, 64 patients diagnosed with GBS were evaluated. The male to female ratio was 1.8:1, which is similar to our findings. However, the mean age of GBS onset in their study was 45 years, which is higher than our study [22]. Another study evaluated 187 patients with GBS. Their findings showed a male to female ratio of 1.3:1, which is lower than our study. Additionally, they found that the mean age of GBS onset was 51 years, which is much higher than both our study and the study by Koga *et al.*, [23]. Overall, these studies demonstrate that the incidence, male to female ratio, and mean age of GBS onset can vary depending on the population being studied.

## CONCLUSIONS

The axonal variant of GBS was more frequent than demyelinating variety as shown in the studies performed in Asian countries. Our study demonstrated the frequency, age and sex distribution similar to the previous studies. Seasonal variation was noted among the different types of GBS.

### Conflicts of Interest

The authors declare no conflict of interest.

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**Case Report**

# Treatment of Gangrenous Phalanx using Combination Therapy of Platelets Rich Plasma (PRP) and Photo Bio Modulation (PBM)

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## ABSTRACT

Gangrene is a dangerous and potentially fatal condition that happens when the blood flow to an area of tissue or organ is cut off. This causes the tissue to break down and die. Gangrene often turns the affected skin a greenish-black color. Due to poor attention and unhygienic conditions, this becomes more contaminated and in the end amputation remains the only treatment option. Traditional therapies cannot provide necessary growth factors to regenerate. Platelet Rich Plasma (PRP) helps in wound healing process by releasing various growth factors. Photo bio modulation (PBM) is also reported for this purpose. **Objectives:** To evaluate the safety and efficacy of PRP and PBM for the treatment of dry gangrene in the fractured little finger in a roadside accident. **Methods:** We report a case of a twenty-seven-year-old male with fractured little finger (Phalanx) in a roadside accident. The patient reported after 6 weeks with dry gangrene and severe pain. The patient treated with combination of PRP and PBM. **Results**: Over a follow up of six weeks, significant improvement was shown with decrease in pain. Little finger was recovered that was showing mobility and growing nail. **Conclusion**: It is concluded that PRP along with PBM is an effective treatment for dry gangrene.

## INTRODUCTION

Gangrene happens due to loss of blood flow in tissues mostly caused by injury or infection. Gangrene commonly affects extremities like limbs, fingers and toes but it can also affect muscles and organs [1]. Serious injury, diabetes, smoking, atherosclerosis, peripheral artery disease and weakened immune system can be major gangrene risk factors [2]. Dry gangrene and wet gangrene are major types. Dry gangrene is mostly associated with autoimmune disease, vascular disease and diabetes [3]. Blood supply to certain area is blocked and it turns purplish-blue to black. Person with dry gangrene generally doesn't have any infection but it may lead to wet gangrene if it becomes infected. Wet gangrene mostly involves infection. It happens when blood supply is cut off to certain area due to burn or trauma in which body part is crushed. It is called wet because of pus formation which can spread to other body parts also [4]. Amputation may occur due to traumatic condition like burn or serious injury or it may also occur due to non-healing wounds in non-traumatic condition. Diabetes is major cause of non-traumatic amputation. The foot amputation has been reported is 8–21% [5]. Worldwide and 85% of these amputations are due to diabetes [6]. Therapies like dressing, surgical debridement and even skin grafting are not satisfactory treatment for wound healing because of unavailability of growth factors that can modulate the healing process [7].

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Use of PRP can be a satisfactory, safe, easy and inexpensive method as it provides growth factors which enhance healing [8]. It has been reported that PRP gel consists of cytokines, growth factors and chemokines which improve tissues growth of acute and chronic wounds [9]. PBM is treatment method in which red and near-infrared light is used to stimulate healing, relieve pain, immunomodulation, reduce inflammation wound healing and tissue regeneration [10]. Due to lack of clear understanding of mechanism of PBM, it is not the part of standardized treatment for wound healing. PBM is non-invasive and has very good effect on stem cells and progenitor cells in enhancing differentiation process which ultimately improves the healing rate of tissues [11]. In our study, A-PRP along with PBM show significant results in case of dry gangrene.

**Case Report**

A 27-years-old male presented at our hospital with fractured distal metaphysis of little finger (Phalanx) of the right hand following a roadside accident 6 weeks ago. He was treated at a basic health unit (BHU) and the fracture was fixed using a 22-gauge needle. His little finger started turning purplish black and complained of severe sharp shooting pain after 3 weeks. He was referred to our clinic by a Family Physician for the treatment after 6 weeks of fracture. At that time the distal Phalanx of the little finger was already turned into purplish-black color. He was suffering from dry gangrene with severe pain. Firstly, surgical debridement of the wound was done under local anesthesia by the general surgeon. A 22-G needle of 44 mm length was fixed in patient's wound, the needle was taken out. After the debridement the patient was treated with PRP injections and PBM. PBM was performed before PRP injections using 660 nm wavelength 100 mW power soft laser. Affected area was irradiated with PBM from 0.5 cm distance from the wound for 2 min on each side for a total of 8 minutes. The PRP treatment included taking 30 ml of blood from the patient and centrifuging it at 2800 rpm for 15 minutes with a soft spin centrifuge. After the centrifugation the buffy coat was extracted carefully a total volume of 3 ml was extracted. Laboratory report (CBC differential) showed 1.5 million paltelets/ml count of the PRP sample. Photo activation of the PRP sample was done using monochromatic light for 10 minutes. After photo activation, PRP was injected in and all around the wound using 25-Guage 25 mm long needle. 3 Sessions of PRP performed with two weeks intervals and 12 sessions of Photo bio modulation treatment were performed twice a week for 6 weeks.

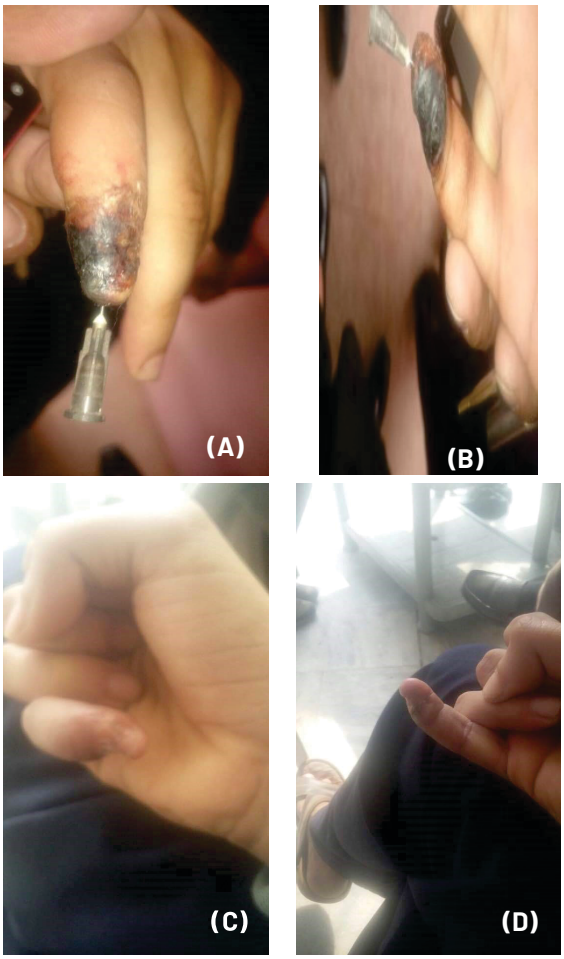


**Figure 1:** Treatemt of Gegrene in distal phalanx of little finger using combination therapy of PRP and PBM A & B are Day 1 before the treatment with PRP and PBM C & D on final visit on 12 weeks (six weeks after the last PRP session) showing recovereded liitle finger with movement and growing nail

## DISCUSSION

Dry gangrene is a condition that involves tissue death and turns it dry, purplish-black, and hard due to arterial occlusion. Body extremities are more prone to it due to insufficient blood supply to the tissues. Ulceration or gangrene is very difficult to treat and often leads to amputation [12]. Traditional methods for wound management are still under practice, but it is an era of regenerative medicine. Use of PRP in wound healing process has progressively increased but still there is a need to establish well-designed randomized trials assessing the efficacy [13]. PRP along with PBM can help in gangrene. The present study hypothesized that combination therapy of PRP and PBM could improve healing process in case of dry gangrene. According to the results, significant improvement was seen in fingertip and nail growth. In parallel to our findings many other reports found PRP as an effective tool to treat gangrene such as in a case study PRP

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along with Split-Thickness Skin Graft was used which reduced the healing time up to half (50%) [14]. Many predisposing factors like smoking, older age and immunodeficiency can delay healing process. In another case study it was shown that healing process was 3 to 6 times less in smokers than non-smokers [15]. Dressing change is painful process and somehow burdensome for medical staff. Use of PRP is helpful in avoiding pressurized dressing and decreased operative time. Valbonesi *et al.*, used PRP in 14 patients and observed rapid wound healing and reduction in infection [16]. Singh *et al.*, made two groups of DFUs. One was treated with PRP and other was treated conventionally. Significant percentage improvement was seen in a group treated with PRP as compared to other group dealt with debridement and simple dressing [8]. PBM promotes accelerated wound healing by stimulating growth factors and the induction of synthesis of vascular endothelial growth factor (VEGF) [17]. It can prevent future complications of wound as well as amputation. In our study combination of PRP and PBM showed effective healing of gangrene as in a study, PBM therapy was used for the treatment of DFUs and significant improvement was observed in all participants with structure and mobility in foot [18]. In a case study, combined effect of antimicrobial photodynamic therapy (aPDT) and photo biomodulation (PBM) was checked on perianal abscess. After 5 days of incision and drainage, infection was clear [19]. The basic purpose of our study was to evaluate the combined effect of PRP and PBM to treat dry gangrene on fingertip, which seemed a very promising approach to heal difficult wounds.

## CONCLUSIONS

It is concluded that Platelets Rich Plasma (PRP) along with Photo Bio Modulation (PBM) were effective in the treatment of dry gangrene.

## Conflicts of Interest

The authors declare no conflict of interest

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**Systematic Review**

# Accuracy of Point-Of-Care Knee Sonography for Diagnosis of Traumatic Anterior / Posterior Cruciate Ligament Tears Taking Magnetic Resonance Imaging as Gold Standard: A Systematic Review and Meta-Analysis

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## ABSTRACT

Knee joint is among the all the body's joints that are much prone to sustains injuries. Injury to the knee ligaments followed by instability can lead to serious deformity. The diagnosis of ligament injuries is frequently performed by using magnetic resonance imaging (MRI), but the use of ultrasonography remains controversial. This article reviews the current literature regarding the viability of point-of-care knee ultrasonography (POCUS) in comparison to knee magnetic resonance imaging (MRI) for the diagnosis of anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) injuries in those individuals who have experienced sudden knee trauma. The data span from 2000 to 2022 was used for the electronic database search (PubMed, Science Direct, Google Scholar). The systematic review included all studies that evaluated the diagnostic efficacy of ultrasound (U/S) compared to MRI as the gold standard and were completely available in English. The meta-analysis reviewing the efficacy of MSK-POCUS for anterior and posterior cruciate ligament injuries includes 30 papers. The overall ultrasonography sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were 76.02%, 92.77%, 92.25%, and 81.91% (95% CI), respectively. By assuring MRI as the gold standard in the diagnosis of ACL and PCL injuries, Point-of-care ultrasound (POCUS) reveals high accuracy. In individuals who have sustained acute knee injuries, the results of POCUS imaging might be serve to provide an initial diagnosis for additional pre-operative work-up.

## INTRODUCTION

Anterior and posterior cruciate ligament tears are common injuries of the knee and a common problem in the casualty of hospitals, occurring because of sports activities , motor vehicle collision, slip down, and fall with the proportion of 67.7%, 19.4%, 9.7%, and 3.2% respectively [1, 2]. The ACL, the knee's primary stabilizing ligament, protects the tibia from rotating in an anterior or medial direction [3]. The Posterior cruciate ligament is another essential ligament that supporting the knee, restricts the tibia from laterally and posteriorly rotation [4]. The ACL is the knee ligament that gets damaged the most commonly with the incidence of greater than 2 million people world-wide sustain an ACL injury each year [5]. Posterior cruciate ligament (PCL) rupture is a kind of rare consequence of traumatic knee ligament injury, accounting for 3-23% of all acute knee ligament injuries [6, 7]. In acute phase of trauma, the diagnostic accuracy of ligamentous injury is frequently low [8]. In general, early diagnosis of anterior and posterior

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cruciate ligament tears is generally made thorough history of patient and clinical examination, but these examinations have shown fairly low sensitivity and high variability resulting in a subsequent delay in diagnosis and an increased probability of severe cartilage damage , deformity and early onset osteoarthritis due to instability specially in youth population [2, 9]. The gold standard for imaging the knee injuries is magnetic resonance imaging (MRI), but routine MRI is not cost-effective as an initial diagnosis and is not readily available in emergency departments [3]. On the other hand, anterior and posterior cruciate ligament injuries can be diagnosed by stress radiography. Conferring to a review article, stress radiography for diagnosing ACL rupture demonstrate less sensitivity (43% -100%) and inconstant specificity (76% - 100%) and similar variability (sensitivity 88-100% and specificity 77-100%) in diagnosing PCL injuries. Furthermore, standardization of the degree of pressure applied during stress radiography to assess the anterior and posterior knee stability has not been established [10, 11]. Point-of-care ultrasound (POCUS) is progressively known in musculoskeletal domain for its investigative worth in the emergency department owing to its precision and ability to image in real-time. By keeping MRI as the gold standard, POCUS demonstrated acceptable sensitivity (92.2%), specificity (95.9%), and accuracy (94.4%) for anterior and posterior cruciate ligament tears, making ultrasound a tool of care, suggest that they can guide clinicians in the management of patients who have had injuries to the knee. So far, POCUS has been used to diagnose wrist, elbow, foot and ankle injuries [2]. Against this contextual, it can be envisioned that Point-of-care knee ultrasound is affordable and quick early diagnostic option that can lead to recommendations for further MRI scanning for acute knee trauma patients to diagnose anterior and posterior cruciate ligament rupture. An un-delayed and accurate diagnosis allows for appropriate treatment. Additionally, POCUS may be useful for patients with claustrophobia and those with artificial knee joints. So, using MRI as the gold standard diagnostic modality, this study's goal was to assess the viability of point-of-care knee ultrasonography (POCUS) for the diagnosis of anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) injuries in those individuals who have experienced sudden knee trauma

## METHODS

Studies that assessed the use of point-of-care ultrasound to diagnose ACL or PCL injuries using MRI or arthroscopy as gold standards and that either directly or through indirect methods presented the original data, analysis was performed to assess the sensitivities, specificities, positive predictive value, and negative predictive value. Studies that had already been published with a smaller sample size (less than 20 cases), inconclusive research, reviews studies, case studies, systematic reviews, and meta-analyses were all subject to our exclusion criteria. We retrieved and identified all relevant literature from Google Scholar. Medical Subject Headings and complimentary words were used in the search, which were restricted to English publications. Two authors each independently read the studies and abstracts. The findings of processes that obviously did not fulfil the inclusion criteria, along with the duplicate research, were excluded. To ascertain whether the preliminary included studies fulfilled all of the inclusion requirements, the investigators studied the whole texts of the papers. The outcomes of the included studies were double-checked by the two examiners. All of the disagreements were discussed with and handled by a third examiner. Two authors came up with the following criteria for information extraction after incorporating the qualified studies: the first author's last name, publication year, Journal of publication, number of patients, disease characteristics, country of the study, PPV, NPV, sensitivity and specificity.

## RESULTS

Figure 1 depicts the characteristics of the selection procedure. We found a total of 199 publications using the search method, including 189 from Google Scholar and Ten from Science Direct.

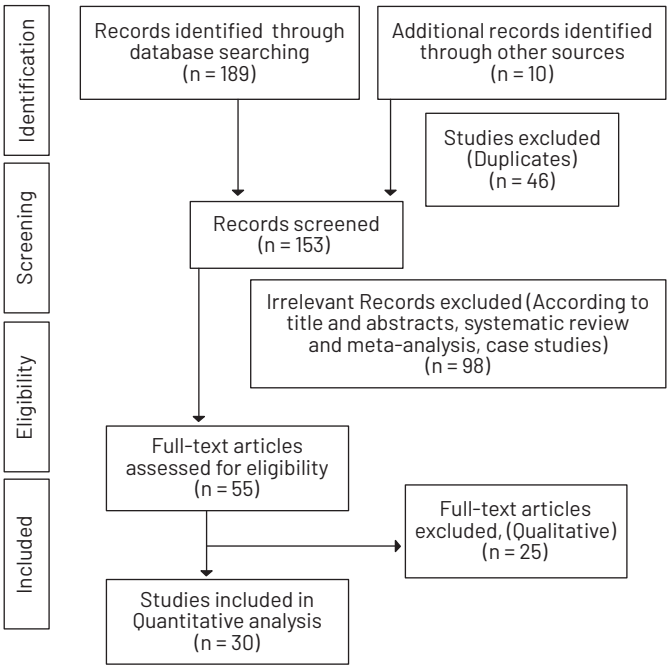


**Figure 1:** Flow Chart of Selected Study Collection Process

Using "EndNote X9" 46 duplicate papers were eliminated, leaving 153 publications. On the basis of the title and abstract, 98 studies-including systematic reviews and/or

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meta-analyses and case reports-were eliminated. Complete reviews were conducted on the remaining 55 papers, 25 of which were discarded because of the missing quantitative table data in complete texts articles. Finally, thirty articles were chosen. (Table 1), from which 16 studies were regarding the precision of POCUS for ACL tears, 11 studies for PCL tears and 03 articles for both ACL and PCL tears. The summary estimates of sensitivity, specificity, PPV, NPV of ultrasound were 80.16%, 89.56%, 94.48% and 75.95% (95 % CI) respectively, for ACL tears; 73.72%, 96.08%, 84.86% and 91.3% (95% CI) respectively, for PCL tears; 62.63%, 96.66%, 95.6%, and 85.7% (95 % CI) respectively, for combined ACL/PCL tears.

**Table 1:** Detailed characteristics of selected studies

| Sr # | Author (year) | Journal | Country | Sample size | Disease | Sensitivity | Specificity | PPV | NPV |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Adil Qayyum et al.[12] | Pak Armed Forces Med Journal | Multan | 59 | ACL Tear | 85.40% | 85.40% | 97.60% | 58.80% |
| 2 | Ken Mautner, MD et al.[13] | Journal of Ultrasound & Medicine | USA | 69 | ACL Tear | 84.90% | 93.80% | 91.80% | N/A |
| 3 | Barzin M et al.[14] | Journal of Gorgan University of Medical Sciences | Iran | 73 | ACL Tear | 65% | 100% | 100% | 70.21% |
| 4 | Gilani SA et al.[15] | Ultrasound in Medicine and Biology | Pakistan | 192 | PCL Tear | 100% | 98.90% | N/A | N/A |
| 5 | Piotr Grzelak et al.[16] | Indian Journal of Orthopaedics | Poland | 83 | ACL Tear | 91.90% | 95.60% | N/A | N/A |
| 6 | Anca Gabriela Stoianov et al.[17] | Journal of Clinical Medicine | Romania | 23 | ACL Tear | 95.45% | N/A | N/A | N/A |
| 7 | H.-G. Palm et al.[18] | The Knee | Germany | 60 | ACL Tear | 97% | 87.50% | N/A | N/A |
| 8 | Sun Hwa Lee et al: [19] | American Journal of Emergency Medicine | Korea | 62 | ACL,PCL Tear | 90.60% | 90.00% | 91.20% | 96.40% |
| 9 | Manon Breukers et al.[20] | BMJ Open Sport & Exercise Medicine | Netherlands | 247 | ACL Tear | 88% | 82% | 79.00% | 90% |
| 10 | Lars Peter Skovgaard Larsen et al [21] | European Journal of Ultrasound | Ireland | 62 | ACL Tear | 88% | 98% | 93% | 96% |
| 11 | Chung-Yuan Wang et al.[22] | Journal of Medical Ultrasound | Taiwan | 35 | PCL Tea | 83.30% | 87.00% | N/A | N/A |
| 12 | Lin-Yi Wang et al.[7] | Knee Surgery Sports Traumatology Arthroscopy | Taiwan | 330 | PCL Tear | 90.60% | 86.70% | 87.90% | 82.40% |
| 13 | Sally M.A. Hussien et al.[23] | Medical Journal of Cairo University | Egypt | 30 | ACL & PCL | 14.30% | 100% | N/A | N/A |
| 14 | Amandeep Singh et al.[24] | International Journal of Anatomy Radiology and Surgery | India | 60 | ACL Tear | 78.20% | 78.30% | N/A | N/A |
| 15 | Ptasznik et al.[25] | American Journal of Roentgenology | Australia | 37 | ACL Tear | 91% | 100% | 100% | 63% |
| 16 | Attya M.S. et al. [26] | AL-AZHAR ASSIUT MEDICAL JOURNAL | Egypt | 60 | PCL Tear | 50% | 96.1% | 66.60% | 92.50% |
| 17 | Cho et al.[27] | The Radiology | Korea | 35 | PCL Tear | 100% | 100% | N/A | N/A |
| 18 | Atul Pratap Singh et al.[28] | Journal of Diagnostic Medical Sonography | India | 103 | ACL Tear | 15% | 95% | N/A | N/A |
| 19 | Bhanupriya Singh et al.[29] | IOSR Journal of Dental and Medical Sciences | India | 50 | PCL Tear | 75% | 93.48% | N/A | N/A |
| 20 | Singh A.P et al..[28] | Journal of Diagnostic Medical Sonography | India | 103 | PCL Tear | 45% | 99% | N/A | N/A |
| 21 | Fuchs,S. et al.[30] | Ultrasound in Medicine and Biology | Germany | 193 | ACL Tear | 90% | 50% | N/A | N/A |
| 22 | Sharma VK et al. [31] | International Journal of Medical Research Professionals | India | 100 | PCL Tear | 42.86% | 100% | N/A | N/A |
| 23 | J. K. Sekiya et al. [32] | The Journal of Arthroscopic and Related Surgery | U.S.A | 16 | ACL & PCL | 83% | 100% | 100% | 75% |
| 24 | Palle Lalitha et al. [33] | Pakistan Journal of Radiology | India | 110 | PCL Tear | 90.90% | 100% | 100% | 99% |
| 25 | Zia Faruqui et al. [34] | Acta orthopaedica Belgica | Saudi Arabia | 81 | ACL Tear | 75% | 100% | 100% | 77.70% |
| 26 | SAGEER P. K et al. [35] | Kerala Journal of Orthopaedics | India | 35 | PCL Tear | 100% | 100% | N/A | N/A |
| 27 | S. K. Venkatesh Gupta et al. [36] | Open Journal of Orthopedics | India | 50 | ACL Tear | 74.20% | 100% | N/A | N/A |
| 28 | Mohammad S. A. Attya et al. [26] | Al-Azhar Assiut Medical Journal | Egypt | 60 | ACL Tear | 81.20% | 84% | N/A | N/A |
| 29 | Singh. B et al..[29] | International Organization of Scientific Research Journal of Dental and Medical Sciences | India | 50 | ACL Tear | 82.35% | 93.94% | N/A | N/A |
| 30 | Maheshwari et al.[37] | Journal of Medical Sciences and Health | India | 50 | PCL Tear | 50% | 97.6% | 80% | 91.1% |

## DISCUSSION

In this paper we evaluated the performance of ultrasound diagnostic techniques; it is well known that clinical examination of acutely injured knees is notoriously unreliable due to pain and inadequate muscle relaxation. Early evaluation of ligament laxity resulted in false-negative outcomes in 12–62% of cases, leading to the introduction of alternative non-invasive diagnostic modalities such as MRI and MSK-US [12]. POCUS has several advantages compared to other imaging methods. First, as compared to different imaging modalities like MRI, Point-of-care ultrasound particularly suitable for frequent and immediate examinations. Second, POCUS promises

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not only to diagnose torn ligaments, but also to distinguish other musculoskeletal disorders in knee trauma patients [13]. Third, as in our study, POCUS can be used to compare injured and uninjured knees in real time. Fourth, functional (dynamic) ultrasound may also be performed [14, 15]. Suzuki et al. confirmed that the anterior cruciate ligament can be visualized directly on ultrasound. However, indirect or dynamic techniques are often used in conjunction with ultrasound to diagnose an ACL tear [38]. A recent review article counseled that the ACL and PCL lie deep with inside the joint and are only partially visible with no cortical attachments. In this setting, direct visualization of ligaments is possible by knee sonography and indirect signs such as joint hemorrhage and hematoma with ultrasound sensitivity 88%, specificity 98%, PPV and NPV of 93% and 96%. In mixed populations, ACL ruptures account for only 17% of joint bleeds, but account for more than 70% of acute joint bleeds in young athletes [12, 17]. Magnetic resonance imaging is an effective imaging technique for the definitive diagnosis of ACL tear. For complete anterior cruciate ligament rupture, MRI showed sensitivity and specificity of 87% and 93%, respectively. However, MRI finding of a partial ACL tear appears difficult, with sensitivities ranging from 40-75% and specificities from 62-89%. The Hoffa's fat pad can be viewed as a hypoechoic wedge-shaped structure, whereas the normal ACL can be seen as a hypoechoic band with an age-related hyperechoic pattern (see Figure 2.A). During passive knee extension/flexion maneuvers in dynamic tests, the unaffected ACL moves upward, sandwiching the Hoffa fat pad between the patellar tendon and anterior cruciate ligament (dynamic direct sign). The Hoffa fatty layer and anterior cruciate ligament do not move upward in the case of a complete tear of the ACL, although scar tissue and minimal Hoffa fat pad upward movement are seen in the case of a partial tear of the ACL. A review paper by Wang J et al., 2018 demonstrated the sonographic diagnostic accuracy in detecting complete rupture of the anterior cruciate ligament, showing 90% sensitivity and 97% specificity [5]. This means that the ultrasound is an efficient test for assessing a complete ACL tear, but since 85% of partial ACL tears were missed by the US, so It may not an adequate test (sensitivity 15%) [5]. Subsequently, in 2019, In a clinical situation where ultrasonography is performed as an initial diagnostic screening test, retrospective observational research involving 247 patients was done to show the diagnostic efficacy of dynamic ultrasound in diagnosing partial and complete rupture of the anterior cruciate ligament. They discovered that a complete ACL tear was more sensitive than for a partial ACL tear (79 vs. 52%). When comparison is made between these two studies, it's found low sensitivity (79% vs. 90%) and specificity (89 vs. 97%) for complete ligament tears. However, it was found to be more sensitive to partial torn (52 vs 15%). MRI allows non-invasive visualization of PCL and therefore plays an important role in detection and evaluation of traumatic PCL lesions. In terms of detecting PCL tears, MRI has been shown to have a sensitivity of 94% and a specificity of 99%. A normal PCL appears as a hypoechoic crescent-shaped structure with a distinct fiber pattern that is easily distinguishable from hyperechoic fat (see Figure 2.B).

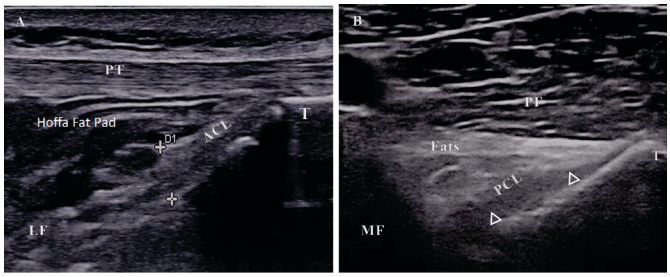


**Figure 2**. Point-of-care ultrasound examinations of the nontraumatic knee. (A, B) Long-axis view of the normal anterior cruciate ligament (cursors, A) and posterior cruciate ligament (arrowheads, B). Continuity, with well-defined hypoechoic bands, is well preserved. PT = patella Tendon; T = tibia; LF = lateral femoral condyle; MF = medial femoral condyle; PF = Popliteal Fossa.

High-resolution sonographic Criteria used to define the presence of acute posterior cruciate ligament tear: (1) marked hypo echogenicity with non-visualization of normal fiber pattern, (2) hypertrophy, (3) ill-defined irregular superficial margins and (4) ill-defined posterior margins [6]. According to Wang, et al., ultrasound has an accuracy of 85.7%, a specificity of 87%, and a sensitivity of 83.3% with MRI as the gold standard, to detect posterior cruciate ligament rupture. Ultrasonography therefore appears to be a reliable diagnostic tool for detecting posterior cruciate ligament rupture. Posterior Cruciate ligament tears were found in only 13 of 35 patients, so further analysis of the location and type of tear (complete or partial) was not possible [5]. Lee and Yun (2017) presented a case report of ACL and PCL injuries by using POCUS in the emergency department in an athlete, whose results could be used as threshold criteria to diagnose tear of the knee's cruciate ligaments. A 19-year-old lady presented to the emergency department with acute-onset severe pain primarily localized to the anterior and posterior aspect of the left knee. Physical examination tests to assess knee instability such as, "anterior drawer", "posterior drawer", "Lachman," "pivot shift," and "quadriceps active" testing cannot be performed due to severe tenderness, pain and mild swelling. A linear array ultrasonic transducer with a frequency of 9-12 MHz was used. For comparison, the right knee was examined first. The knee was placed in a flexed

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position about 120-150 degrees. The patient was positioned in the supine posture lying on the back for ACL evaluation and in the prone position for PCL evaluation. Ultrasonographic examination of the left knee showed a rupture where the tibial ACL attaches with retraction of the torn split ends, consistent with a complete ACL tear as seen in Figure 3.A. Moreover, the images showed partial interruption at mid site of PCL without retraction, consistent with incomplete/partial PCL tear, same findings of partial ACL tear could appear (Figure 3.B). The patient was admitted to the hospital and underwent a preoperative knee MRI [1]

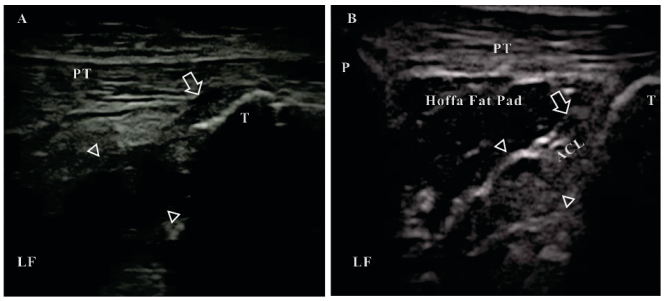


**Figure 3.** POCUS examinations of the complete and partial ACL tear. Long-axis view of the Complete tear of anterior cruciate ligament (ACL) (A) and partial tear of ACL (B). Complete disruption at the proximal ACL discontinuity between femoral attachment site (arrowheads) of the ACL and distal torn retracted fragments (open arrows, A) is observed, indicating complete ACL rupture. In addition, partial disruption (arrowheads, B) of the continuity at the mid-ACL without retraction is observed, indicating partial ACL rupture. LF = lateral femoral condyle; T = tibia; P = patella; MF = medial femoral condyle; PT = patella tendon.

Kim, D.H et al. demonstrated the Ultrasound criteria for diagnosing ACL/PCL rupture include discontinuities and indirect signs (anechoic space at femoral ACL insertion site, thickening of the ACL/PCL, and irregular posterior margin). Indirect ultrasound criteria are more sensitive (90%) than direct criteria (70% and 60%) in diagnosing acute ACL/PCL rupture and specificity (80%) are excellent. A hematoma and echo-poor space presents the characteristic sonographic criteria [39]. MRI signs of acute complete ACL rupture include non-visualization of the ACL; discontinuities of bands with abnormally increased T1 and T2 signals due to edema and hemorrhage; morphological abnormalities such as thickened, wavy, or retracted appearance; and an angle to the horizontal plane. In acute partial tears, the ACL bundle appears intact, but the ligament thickens with a high intensity signal of T2. When the PCL is completely ruptured, the fiber becomes discontinuous and the liquid signal passes completely through the fiber. Partial ruptures thicken the PCL and increase signal. Some of PCL fibers still appear intact, some appear discontinuous [40].

## CONCLUSIONS

In conclusion, Knee POCUS (Point-of-care ultrasound) is affordable and quick early diagnostic option that can lead to recommendations for further MRI studies for diagnosing anterior and posterior cruciate ligament tears with acute knee traumatic patients. By un-delayed and accurate diagnosis, proper management could be possible. Furthermore, POCUS could be useful in claustrophobic patients and for those who had knee implants.

## Conflicts of Interest

The authors declare no conflict of interest

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