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Original Article

Association Between Nurses' Knowledge and Practice Regarding Chemotherapy Induced Peripheral Neuropathy and its Development in Cancer Patients

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ABSTRACT

The adverse effects of peripheral neuropathy caused by chemotherapy include numbness, tingling, irritation, burning, difficulty keeping balance, and a chilling sensation. CIPN is one of the symptoms that has the potential to negatively impact the patient's quality of life (QoL), the treatment plan, and their overall safety. **Objectives:** To determine oncology nurses' knowledge and practice regarding chemotherapy-induced peripheral neuropathy (CIPN) and its development in cancer patient. **Methods:** In a descriptive cross-sectional study, 172 registered nurses from two public hospitals were chosen with convenient sampling to see if there was an association between their knowledge and practice about chemotherapy-induced peripheral neuropathy in regard with its development in cancer patients. Three revised questioners were used to get information about nurses' knowledge, practice and 1 questioner from patient about neuropathy development. (Knowledge, practice and neuropathy devolvement). **Results**: Knowledge showed that 56.4 % of participants had fair knowledge and Practice showed that 49.4 % of participants had fair practice, while 47.1% of patient had developed mild neuropathy. Chi square test was performed to see the association which showed a significant association between neuropathy development with nurses' knowledge and practice as results were 0.000 (p-value is <0.005 taken as significant). **Conclusions:** There is a critical need to enhance oncology nurses' abilities in neurological assessment, and a reliable method of CIPN evaluation is essential. Guidelines for the treatment and evaluation of CIPN, as well as further studies in different health institutions to generalize the results across Pakistan, are urgently needed.

INTRODUCTION

Cancer is the most common cause of death in people. It is a debilitating condition that has an extremely high morbidity and fatality rate [1]. Cancer is a disease that does not target a particular age group but rather can strike people at any point in their lives. Cancer is ranked as the second leading cause of mortality worldwide [2]. It is anticipated that there are 443.4 new cases of cancer for every 100,000 men and women. In addition to this, the death rate due to cancer is 158.3 for every 100,000 men and women [3]. Cancer patients' chances of survival are directly influenced by how quickly the disease is diagnosed and by the treatment options that are made available to them. Chemotherapy and radiation therapy are the two most significant and widely used treatments for cancer, however there are only a few options available to treat the disease. Chemotherapy is the most successful treatment option for patients diagnosed with cancer [4]. In the early part of the 20th century, cytotoxic medications were first used for the treatment of cancer. Since then, these drugs have been successfully used to treat a wide variety of cancers [5]. Cytotoxic drugs (CDs) are one of the important groups of medicines which are used for the treatment of cancer. These drugs are also known as antineoplastic, anticancer or cancer chemotherapy drugs [6]. The prevalence of cancer patients in Pakistan was projected to be 329,547 according to a survey conducted between the years 2016 and 2020 [7]. And it is reasonable to anticipate that the number of cancer cases will rise by 2.3 million per year. Out of the total number of nurses in the world, there are 28 million, and 5.5 million of them interact with cytotoxic

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medications [8]. Afghani 4.88 %, Balochi 3.89 %, Balti 2.49 %, Gilgit 2.46 %, Hazara 3.48 %, Hindko 3.39 %, Memon 2.26 %, Punjabi 24.47 %, Pushto 16.69 %, Saraiki 9.23 %, Sindhi 11.65 %, and Urban sindhi(Muhajir)15.09 % were observed to have received chemotherapy and other treatments such as radiation and surgery. The demographic or ethnic group with the highest prevalence was Punjabi (24.47 %), while Memons had the lowest prevalence (2.26 %). In Punjab according to cancer registry forum report 2021 most commonly reported cancers across all age groups and both sexes were (N=6,507) [9]. The chemotherapy-induced peripheral neuropathy (CIPN) is one of the most common side effects of antineoplastic drugs, with a prevalence that can range anywhere from 19 % to more than 85 %. CIPN is primarily a sensory neuropathy, but it can also cause varying degrees of motor and autonomic dysfunction for varying amounts of time. Due to the high prevalence of CIPN among cancer patients, it presents a significant challenge not only for cancer patients but also for cancer survivors and the medical professionals who care for them. This is especially true due to the fact that there is no one foolproof way to prevent CIPN, and the treatment options for this syndrome are extremely restricted. To be able to develop effective CIPN prevention and treatment techniques, a deeper understanding of the underlying risk factors and mechanisms that contribute to the condition is required [10]. Oncology nurses play a key role in the diagnosis and treatment of CIPN. Despite broad consensus among nurses regarding the need of CIPN evaluation, research indicates that many practitioners lack confidence in their assessment abilities [11]. Chemotherapy-induced peripheral neuropathy (CIPN) is a typical dose-limiting side effect encountered by cancer patients. Approximately 30-40% of patients treated with neurotoxic chemotherapy may develop CIPN, and the severity varies greatly between people. It is frequently sensory-predominant with discomfort, which can result in long-term morbidity in survivors. As cancer survival rates improve, the prevalence and burden of CIPN late effects are predicted to rise [12]. CIPN occurs in 30 to 90 % of patients receiving neurotoxic chemotherapy, including platinum compounds, taxanes, vinca alkaloids, immunomodulatory drugs, and bortezomib, according to various studies. The incidence and severity of CIPN are known to be affected by the chemotherapeutic agent used, preexisting neuropathy, cumulative dose, dose intensity, and duration of chemotherapeutic drug exposure [13]. The role of nurses in the treatment of CIPN is essential. Assessing CIPN at baseline and before each cycle of chemotherapy is crucial, and nurses have a lot of insight on how to do so. The quality of life of cancer patients can be improved via the education of oncology nurses on the warning signals of chemotherapy and adjuvant medication-induced peripheral neuropathy(CIPN)[14]. As a typical side effect of neurotoxic chemotherapy, treatment-induced peripheral neuropathy is a prevalent problem for cancer patients. Depending on the length of chemotherapy and the usage of platinum-based drugs, plant alkaloids, taxanes, and bortezomib, the incidence of CIPN among cancer patients is estimated to be around 38% [15]. There is a chance that patients will not report experiencing pain from CIPN until they are pushed to do so. Thus, oncologists should often check their patients for neuropathy and neuropathic pain [16]. The contributions of nurses to scientific inquiry and the evaluation of the efficacy of treatments and management improve the QoL of CIPN patients. If oncology nurses had greater knowledge of various pharmacological and non-pharmacological treatments, the effects of CIPN could be prevented and reduced, according to the study [17]. Nurses in many different practice settings carry out the majority of CIPN screening. As a result, nurses are in a prime position to identify the earliest symptoms of peripheral neuropathy while the patient is receiving treatment[11].

METHODS

It was a Descriptive Cross-sectional study conducted in Jinnah Hospital Lahore and services hospital Lahore with sample of n=172 nurses recruited through convenient sampling method. Nurses with the age between 22 years to 50 years, having clinical experience more than 6 months in oncology with qualification of Generic BSN, Post RN, Diploma nursing are included while nurses with experience less than 6 months and doing administrative task were excluded in this study. In this research 3 revised instruments were used (1. knowledge, 2. practice 3. neuropathy development.) knowledge tool consisted of 17 MCQs based questions, which are divided into 3 categorize (0-49% considered as poor, 50-74 considered as fair, 75% or more is considered as good knowledge). Practice tool consisted of 15 observational questions, done and not done, 0 marked as not done while 1 marked as done. Which are divided categorically into 3 categorize (0-50% considered as poor practice, 51-74 considered as fair practice, 75% or more is considered as good practice)[11]. Development Questions are each rated to indicate frequency of practice behaviors on a scale of 0-3(not at all, a little, quite a bit, very much). The neuropathy of the patient is assessed as three categories; mild, moderate and savior. A score of above 75% will considered "saviors", score between 51% to 74% will be considered as "moderate" and below 50% of the score will be considered as "mild"[18]. The quantitative data were measure by SPPS Statistical Package of Social Sciences (SPSS) software version 26. The qualitative data was measure by frequency. Chi-square

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were implemented and p-value less than or equal to 0.05 were taken as significant.

RESULT

Table 1 demonstrate that that172 participants were involved in the study. Age: The majority 37.2% of participants were between the ages of 28-33 years, 27.3% participants were from age group of 34-39, 22.7% participants were from age group of 22-27, 11% participants were from age group of 40-45 while 1.7% participants were from age group of 46-50. Gender: majority of the participants were female with (n=158) 91.9% of the population. Male participants were (n=14) with 8.1% of the population. Total experience: Results revealed that majority of the 56.4% participants had experience of > Then 5 Years. 39% participants had experience of 1-5 years whereas 4.7% participants had experience of < Than 1 year. Oncology experience: majority of the 72.7% participants had 1 to 5 years of experience in recent oncology department, 16.3% had < than 1 year of experience while 11.0% had > than 5 years of experience in oncology department. Qualification: majority 49.4% of participants were diploma holder, 30.8% were Post RN BScN, while 19.8% participants were Generic BSN. Oncology certificate: 89% participants were working in Oncology department has no oncology certificate, whereas 11% participants were working in oncology unit have.

Variables		Frequency (%)
Age	22-27 years	39 (22.7%)
	28-33 years	64 (37.2%)
	34-39 years	47 (27.3%)
	40-45 years	19 (11.0%)
	46-50 years	3 (1.7%)
	Total	172 (100%)
Gender	Male	14 (8.1%)
	Female	158 (91.9%)
	Total	172 (100%)
Job experience	< Than 1 year	8 (4.7%)
	1-5 Years	67 (39.0%)
	> Than 5 Years	97 (56.4%)
	Total	172 (100%)
Oncology experience	< Than 1 year	28 (16.3%)
	1-5 Years	125 (72.7%)
	> Than 5 Years	19 (11.0%)
	Total	172 (100%)
Qualification	Generic BSN	34 (19.8%)
	Post RN BScN	53 (30.8%)
	Diploma in Nursing	85 (49.4%)
	Total	172 (100%)
Oncology certificate	Yes	19 (11.0%)
	No	153 (89.0%)
	Total	172 (100%)

Table 1: Demographic data of the participants

Knowledge: showed that 56.4% of participants have fair knowledge, 29.7% have Poor Knowledge, while only 14% of participants have good knowledge. Practice: showed that 49.4% of participants have fair practice, 45.3% have Poor practice, while only 5.2% of participants have good Practice. Development of neuropathy: showed that 47.1%o f patient has devolved mild neuropathy35.5% have devolved moderate neuropathy, while 17.4% have devolved severe neuropathy (Table 2).

Variables	Frequency (%)
Knowledge	
Poor (0-49%)	51 (29.7%)
Fair (50-74%)	97 (56.4%)
Good (Greater or equal to 75%)	24 (14.0%)
Total	172 (100%)
Practice	
Poor (Less than or equal to 50%)	78 (45.3%)
Fair (51-74%)	85 (49.4%)
Good (Greater or equal to 75%)	9 (5.2%)
Total	172 (100%)
Development of neuropathy in patients	
Mild (Less than or equal to 50%)	81 (47.1%)
Moderate (51-74%)	61 (35.5%)
Severe (Greater or equal to 75%)	30 (17.4%)
Total	172 (100%)

Table 2: Categorical knowledge, practice and neuropathy development scores

Table 3 illustrates the significant association between knowledge with neuropathy development, practice with neuropathy development as the results checked with chi square test, p-value was 0.00 (p-value is <0.05 taken as significant).

Knowledge	Development				
	Mild	Moderate	Severe	Chi-square	p-value
Fair (50-74%)	59	35	3	74.624357	.000
Poor (0-49%)	5	19	27		
Good (Greater or equal to 75%)	17	7	0		
Practice	**Development**				
	Mild	Moderate	Severe	Chi-square	p-value
Poor (Less than or equal to 50%)	8	40	30	89.801	.000
Fair (51-74%)	64	21	0		
Good (greater or equal to 75%)	9	0	0		

Table 3: Association between knowledge with neuropathy development & practice with neuropathy devolvement

DISCUSSION

The current study demographics that were male nurses just 8.1% and age of participants from ages between 22-27 years of were 22.7% that are contrary to the study that revealed that (31.4 %) of the sample was between the ages of (25-29 years) and that (52.1 %) of the sample was male

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[5]. The knowledge of nurses is this study is fair which helped the mild development of CIPN in oncology patient, the present study results conflicting the study of nursing knowledge, practice patterns, and learning preferences regarding chemotherapy-induced peripheral neuropathy and found that nurses in the survey lacked knowledge regarding neurotoxicity of specific agents, evidence-based treatments and assessment of CIPN patients [19]. 50-74 % of nurses have adequate knowledge of CIPN risk factors, indicating a knowledge-practice gap, oncology nurses emphasized the importance of CIPN assessment in their clinical practices; however, 75% believed assessment skills played no significant role. There was a remarkable lack of knowledge among nurses with no prior experience with CIPN assessment instructions. Indicating that the required foundational nursing knowledge for the CIPN assessment was insufficient [20]. Another study showed that more than half of the nurses had 1-5 years oncology experience 72.7%, half of the participants just had diploma degree in nurses 49.4% and most alarming was that two third of the nurses had no oncology certificate 89% which resulted as inadequate practice by half of the nurses. These results of this study were different from another study who found that the oncology nurses had adequate nursing practice regarding chemotherapy induced peripheral neuropathy and assessment practices did not routinely include neurologic physical assessment [11]. In another study conducted in Jordan, on the oncology nurse's knowledge and practices showed the mean CIPN knowledge score of 8.98+1.9 which indicates poor knowledge. Despite the fact that only 58.8% of respondents stated that CIPN assessment is required for their oncology practices, the majority of respondents evaluated their skills as inadequate. The neurologic physical exam is only occasionally included in the practice evaluation. 57.1% of respondents, including patients and their relatives, expressed anxiety about CIPN [20]. Another study reported that the survey's nurses lacked understanding of the neurotoxicity of certain drugs and empirically supported treatments. Rarely were standardized measurement instruments and physical examinations with a CIPN focus employed during assessment [21].

CONCLUSIONS

The nurses with excellent clinical skills had a thorough understanding of how to assess CIPN patients. This study indicated that vast knowledge and best practice benefited the patient, i.e., if these factors are high, there is a lower possibility that patients will acquire CIPN.

Conflicts of Interest

The authors declare no conflict of interest

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