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Original Article

Evaluation of Risk Factors Associated with Severe Suicide Attempts among Individuals Presenting at the Emergency Department

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ABSTRACT

Severe suicide attempts represent critical incidents characterized by high lethality or medical acuity, posing significant risks of morbidity and mortality. **Objective:** To assess the risk factors linked to severe suicide attempts among those presenting in the Emergency Department. **Methods:** The cross-sectional study took place at the Department of Forensic Medicine, Makran Medical College, Turbat, Pakistan covering the period from 21 December 2023 to 21 March 2024. The study included 90 patients aged 18 years or older who were admitted to the ED with a documented suicide attempt. Variables related to demographic characteristics, clinical presentations, substance use history, and details of the suicide attempt. Collected data were processed and analyzed using IBM SPSS, version 27.0. **Results:** The majority of participants were female (56.7%), with a mean age of 31.01 ± 12.42 years. Major depressive disorder was the most prevalent (33.3%), followed by anxiety disorder (18.9%). Other conditions included abuse of narcotics (6.7%), schizophrenia (4.4%), and a history of previous suicide attempts (1.1%). The most frequently cited reasons were psychiatric illnesses (n=28, 31.1%) and family problems (n=26, 28.9%), followed by financial problems (13.3%) and romantic relationship issues (6.7%). In the study cases, suicide attempts mostly occurred between 6 am to 12 pm (38.9%) and 12 pm to 6 pm (34.4%). The majority of patients were hospitalized (61.1%). **Conclusions:** It was concluded that the urgent need for targeted suicide prevention initiatives, with major depressive disorder identified in 33.3% and drug poisoning as prevalent in 40.0% of suicide attempts.

INTRODUCTION

Suicide, a profoundly complex and tragic phenomenon, involves intentionally ending one's own life [1]. Suicide claims approximately 800,000 lives annually worldwide, with rates varying across regions and demographics. Globally, it ranks as the second most common cause of death among individuals aged 15-29 years [2, 3]. Unlike completed suicides, suicide attempts involve deliberate self-harm with non-fatal outcomes. While these attempts may not result in death, they carry significant physical, emotional, and societal ramifications [4, 5]. Suicide attempts are frequently preceded by overwhelming psychological distress, including but not limited to depression, anxiety, trauma, substance abuse, and psychotic disorders. Individuals experiencing intense emotional pain or hopelessness may perceive suicide as the only means of escape from their suffering [6]. Additionally, a history of earlier attempts of suicide is common prognosticators of future suicidal actions, underscoring the need for targeted intervention and support for at-risk individuals [7]. Contact with the emergency department (ED) provides a chance to proactively address and prevent suicide attempts and fatalities. In order to effectively prevent suicidal behaviour, it is imperative for EDs to implement strong interventions, thus establishing themselves as a vital component of the suicide prevention continuum [8]. Severe suicide

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attempts, marked by either high lethality or acute medical urgency, require specific attention owing to their increased likelihood of unfavorable consequences [9]. In severe suicide attempts, prevalent risk factors include mental health disorders such as depression (60-70%), substance abuse (30-40% alcohol, 20-30% drugs), previous suicide attempts (20-40%), psychosocial stressors like relationship difficulties (40-50%), and access to means such as firearms (50-60%) [10]. Despite the critical importance of identifying and addressing risk factors associated with severe suicide attempts, limited research has focused specifically on this population within the ED setting.

This study sought to address this gap by systematically evaluating the risk factors associated with severe attempts of suicide in persons presenting at the ED. This study contributed novel insights into the risk factors for severe suicide attempts among Emergency Department patients, addressing a dearth of literature on this topic. This study aimed to fill a critical gap in research within the context of Pakistan, offering context-specific findings to inform targeted interventions and suicide prevention efforts in the region.

METHODS

A cross-sectional study took place at the Department of Forensic Medicine, Makran Medical College, Turbat, Pakistan covering the period from 21 December 2023 to 21 March 2024. This study adhered to the principles set forth in the Declaration of Helsinki and obtained approval from the Institutional Review Board (Reference number: MMC/ERC/115/2023, dated: 20th December 2023). Patient confidentiality was strictly maintained throughout the study, and all data were anonymized prior to analysis. The sample size calculation was done using WHO calculator (www.openepi.com) and 90 sample size was determined using a 95% confidence level, 5% margin of error, and assuming a prevalence of severe suicide attempts of 17.2% [11]. The study included 90 patients presenting at the Emergency Department (ED) following a suicide attempt aged 18 years or individuals of advanced age who were admitted to the Emergency Department (ED) with a documented suicide attempt. Patients with incomplete medical records and patients presenting with accidental injuries or self-harm without suicidal intent were excluded. Data were collected using a standardized data collection form after informed consent from the patients. Variables of interest included demographic characteristics, clinical presentations, psychiatric diagnoses, substance use history, psychosocial stressors, and details of the suicide attempt. The primary outcome measure was the severity of the suicide attempt, classified as severe or non-severe based on criteria such as lethality of method, medical acuity, and need for intensive medical intervention. The data collected underwent processing and analysis using IBM SPSS, version 27.0. Categorical variables were depicted as frequency and percentage, while continuous variables were represented by mean and standard deviation (SD). Chi-square tests was conducted to explore the correlation between potential risk factors and severe suicide attempts.

RESULTS

The sociodemographic characteristics of 90 patients, who were admitted to the emergency department due to suicide attempts. The majority of participants were female 51 (56.7%), with a mean age of 31.01 ± 12.42 years. The age distribution revealed that 60% of participants fell within the age group of 21-40 years. Regarding marital status, 45.6% were single, 40.0% were married, and 14.4% were divorced. Educational status varied, with 24.4% having completed high school, 22.2% completing elementary school, and 10.0% attaining university education. Most participants resided in urban areas 64 (71.1%), and the majority identified as Muslim 83 (92.2%) (Table 1).

Table 1: Sociodemographic Characteristics of Study Participants (n = 90)

Parameters	n (%)
Gender	
Female	51 (56.7%)
Male	39 (43.3%)
Age Groups (Years)	
20 or Less	15 (16.7%)
21-40	54 (60.0%)
41-60	16 (17.8%)
More than 60	5 (5.6%)
Age (Years)	
Mean ± SD	31.01 ± 12.42
Marital Status	
Divorced	13 (14.4%)
Married	36 (40.0%)
Single	41 (45.6%)
Educational Status	
Illiterate	3 (3.3%)
Read and Write	4 (4.4%)
Elementary School	20 (22.2%)
Middle School	9 (10.0%)
High School	22 (24.4%)
University	9 (10.0%)
Unknown	23 (25.6%)
Region of District	
Rural	26 (28.9%)
Urban	64 (71.1%)
Religion	
Christian	6 (6.7%)
Hindu	1 (1.1%)
Muslim	83 (92.2%)

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The prevalence of clinical psychiatric conditions among suicide attempters presenting at the emergency department. Major depressive disorder was the most prevalent (33.3%), followed by anxiety disorder (18.9%). Other conditions included abuse of narcotics (6.7%), schizophrenia (4.4%), and a history of previous suicide attempts(1.1%)(Table 2).

Table 2: Prevalence of Clinical Psychiatric Conditions among Suicide Attempters Presenting at Emergency Department

Clinical Psychiatric Data	n (%)
Abuse Of Narcotic	6 (6.7%)
Anxiety Disorder	17 (18.9%)
Bipolar Disorder	1 (1.1%)
History Of Suicide Attempt	1 (1.1%)
Major Depressive Disorder	30 (33.3%)
Schizophrenia	4 (4.4%)
Unknown	31 (34.4%)

Drug poisoning was found to be the most common suicide method with 36 (40.0%) followed by pesticide poisoning 21 (23.3%), cutting/stabbing objects 13 (14.4%), hanging 8 (8.9%), jump from high place (7.8%), firearm (2.2%) and corrosive intake (2.2%)(Table 3).

Table 3: Methods Employed in Suicide Attempts among Study Participants

Methods Of Suicidal Attempt	n (%)
Corrosive Substance Drinking	2 (2.2%)
Cutting/Stabbing Object	13 (14.4%)
Drug Poisoning	36 (40.0%)
Firearm	2 (2.2%)
Hanging	8 (8.9%)
Jump From High Place	7 (7.8%)
Narcotic Poisoning	1 (1.1%)
Pesticide Poisoning	21 (23.3%)

Drug poisoning was found to be the most common suicide method with 36 (40.0%) followed by pesticide poisoning 21 (23.3%), cutting/stabbing objects 13 (14.4%), hanging 8 (8.9%), jump from high place (7.8%), firearm (2.2%) and corrosive intake (2.2%)(Table 3).

Table 4: Motivating Factors Behind Suicide Attempts among Study Participants

Reasons For Suicidal Attempt	n (%)
Family Problems	26 (28.9%)
Financial Problems	12 (13.3%)
Psychiatric Illnesses	28 (31.1%)
Romantic Relationship Issue	6 (6.7%)
Unknown	18 (20.0%)

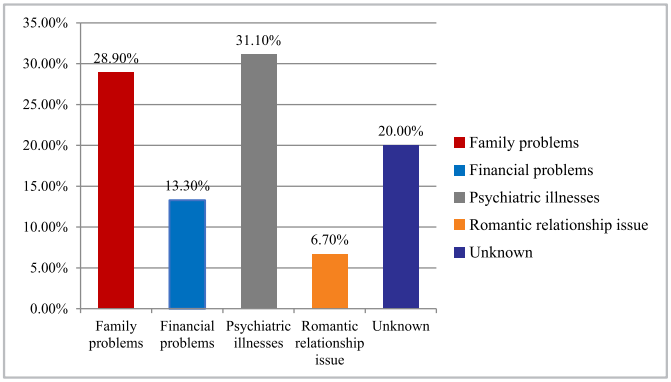

Figure 1: A Comparison between Males and Females was Conducted Based on the Reasons for Attempted Suicide

In the study cases, suicide attempts mostly occurred between 6 am to 12 pm (38.9%) and 12 pm to 6 pm (34.4%) (Table 5).

Table 5: The Temporal Distribution of the Time of Suicide Attempts was Examined

Time of Suicide Attempt	n (%)
6 am to Noon	35 (38.9%)
6 pm to Midnight	18 (20.0%)
Midnight to 6 am	6 (6.7%)
Noon to 6 pm	31 (34.4%)

Of the total cases, 13 (14.4%) resulted in death, while 22 (24.4%) were discharged from the emergency department. The majority, 55 (61.1%), were hospitalized (table 6).

Table 6: Clinical Outcomes of the Suicidal Attempters Presented to the Emergency Room

Clinical Outcome	n (%)
Death	13 (14.4%)
Discharged from Emergency	22 (24.4%)
Hospitalization	55 (61.1%)

DISCUSSION

Suicide entails intentionally ending one's own life, typically following a sequential progression of ideation, planning, and attempted execution [12]. This intricate phenomenon is characterized by its multifaceted nature, influenced by a myriad of contributing and facilitating factors. The interplay of neurobiological, familial, and environmental elements, alongside exposure to stressors within socio-cultural contexts, shapes the dynamics of suicidal behavior [13, 14]. Our study assessed the major risk factors associated with severe suicide attempts among individuals presenting to the ER. In terms of socio-demographic characteristics of the patients, mean age of the patients was (31.01 ± 12.42 years) with 60% of participants in the age group of 21-40 years. Around similar mean age (28.4 ± 11 years) were reported in India and a bit lower mean age (26.44 ± 8.1 years) was reported by Yaqoob *et al.*, in Pakistan [15]. Naveed *et al.*, reported age of the participants as 31.1% (10-20 years), 40.1% (21-30 years) and 14.8% (31-40 years).

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These discrepancies may stem from regional variations or differences in healthcare circumstances of these studies [16]. In terms of gender distribution, the study included 51 females (56.7%) and 39 males (43.3%). This aligns with findings reported by Alvi *et al.*, where females constituted 53% of the sample [17]. While other studies like Naveed *et al.*, reported male dominance as 61.8% and Imran *et al.*, reported male dominance as 51.5%. Regarding marital status, 45.6% were single, 40.0% were married, and 14.4% were divorced [16, 18]. Educational status varied, with 24.4% having completed high school, 22.2% completing elementary school, and 10.0% attaining university education. Most participants resided in urban areas (n=64, 71.1%), and the majority identified as Muslim (n=83, 92.2%). High prevalence among the single patients was reported by Khan *et al.*, which were around 40% and high incidence among the school students was reported by Imran *et al.*, which turned out to be 77.78% [18, 19]. Regarding the method of suicide, drug poisoning was found to be the most common suicide method (n=36, 40%), followed by pesticide poisoning (n=21, 23.3%), cutting/stabbing objects (n=13, 14.4%), hanging (n=8, 8.9%), jump from high place (7.8%), firearm (2.2%) and corrosive intake (2.2%). Similar methods of suicide were reported by Naveed *et al.*, with poisoning (43.69%) followed by hanging (30.6%) and firearms (13.57%) of completed suicides. Yaqoob *et al.*, documented a range of distinct self-harm methods, including medication overdose (35.9%), severing critical veins (26.4%), bodily cutting resulting in scars (19.5%), hanging (5.5%), burning (5%), jumping from elevated locations (3.2%), and firearm use (2.3%). The variations could be assumed considering the regional and cultural differences in the behaviors [15, 16]. The most frequently found reasons of suicide attempts were psychiatric illnesses (31.1%) and family problems (28.9%), followed by financial problems (13.3%) and romantic relationship issues (6.7%). Naveed *et al.*, stated the reasons like domestic conflicts (70.7%), financial reasons/poverty (14.1%), failure in marriage (6.2%), mental illness (3.3%) etc. Concerning the clinical psychiatric conditions, major depressive disorder (MDD) was the most prevalent (33.3%), followed by anxiety disorders (18.9%), abuse of narcotics (6.7%), schizophrenia (4.4%), a history of previous suicide attempts (1.1%) along with (34.4%) cases occurring due to unknown causes. Khan *et al.*, also stated high prevalence of depression (69%) in the cases [16, 19]. Regarding the time of the attempts, we found that most of the cases occurred during the day time (73.3%) which was contrary to what was found by Khan *et al.*, were (60%) of the cases occurred during the late night period. Moreover, majority of patients were hospitalized (61.1%), around (24.4%) of the patients were discharged and the mortality rate in our study was (14.4%). (92%) of the cases were discharged (including the ones on demand) and mortality rates were 8% [14, 19]. Shekhani *et al.*, and Wordefo *et al.*, also find similar results regarding the prevalence of major depressive disorder and drug poisoning as primary factors in suicide attempts [20, 21]. The main strengths of our study were that it provided meaningful insights into the critical risk factors associated with severe suicide attempts in the community. We aimed at a multifaceted approach addressing the identified socio-demographic, clinical and circumstantial factors regarding suicides in our population.

CONCLUSIONS

This study underscores the urgent need for targeted suicide prevention initiatives, with major depressive disorder identified in 33.3% and drug poisoning as prevalent in 40.0% of suicide attempts. With a mortality rate of 14.4% observed, there is a critical imperative for comprehensive mental health support services for individuals presenting with suicidal behaviors in Emergency Department settings.

Authors Contribution

Conceptualization: AAT
Methodology: IA, AAT, AR, NA
Formal analysis: F, AS
Writing-review and editing: AS, AR, NA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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