ORIGINAL ARTICLE

PATTERN OF SUICIDE DEATHS: A RETROSPECTIVE 5-YEAR AUTOPSY SAMPLE ANALYSIS IN PAKISTAN

NAZISH IMRAN[1], FAREEHA TARIQ[2], IZWA BHATTI[3], SUMMAIYA SYED TARIQ[4], RIASAT ALI[5], HAFSAH EHSAN ULLAH[6]

[1,3]Department of Child and Family Psychiatry, King Edward Medical University, Lahore, Punjab, Pakistan
[2,6]Department of Forensic Medicine, King Edward Medical University, Lahore, Punjab, Pakistan
[4]Office of Police Surgeon Karachi, Sindh, Pakistan
[5]Office of Registrar, King Edward Medical University

CORRESPONDENCE: **DR. NAZISH IMRAN** E-mail: nazishimrandr@gmail.com

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ABSTRACT

OBJECTIVE
Suicide is a global public and mental health problem. In this study, we evaluated autopsy reports of suicidal deaths for 5 years to study the demographic distribution of the suicide victims and methods of suicides.

DESIGN OF STUDY
It is a descriptive cross-sectional study of suicide autopsies.

PLACE AND DURATION
The study was conducted at the mortuaries of two large Forensic departments in Punjab and Sindh (King Edward Medical University/Mayo hospital, Lahore, and Jinnah Postgraduate Medical Centre Karachi) for 5 years, between January 2017 and December 2021.

SUBJECTS AND METHOD
Data were collected on pre-designed proforma and statistically analysed using SPSS 26.

RESULTS
Between 2017 and 2021, 98 cases of suicide were examined in the two study centres (67 males, 68.4% and 31 females, 31.6 %). Fifty-six suicides (57%) were in age group under 30 years old. The most frequently used methods for suicide were hanging (41, 41.8%), use of firearms (23, 23.5%), Self-poisoning (11, 11.2%), and jumping from heights (6, 6.1%). Significant differences were noted regarding the method of suicide among gender and different age groups as well as different study centres (p value <.05). Firearms were used solely by males, and all deaths due to jumping from heights were in Karachi.

CONCLUSION
Due to local cultural and religious beliefs, the autopsy rate in suicide seems too low. There was a male preponderance amongst suicidal death autopsies in our study sample. Hanging, Firearms and self-poisoning were the most frequent suicidal methods. Provision of psychological and social support along with restriction to easy access to firearms and poisons should be considered by policy making and healthcare authorities to tackle this preventable public health problem.

KEYWORDS
Autopsy, Firearms, Poisons, Policy Making, Suicidal Ideation, Suicide.

INTRODUCTION
Suicide is defined as a deliberate taking of one's own life. It is a grave, major global public health problem, with an estimated 703,000 people a year taking their life around the world. More than one in every 100 deaths in 2019 was the result of suicide.[1] The World Health Organization (WHO) South-East Asia region has the highest suicide rates (13.4 per 100,000) compared to other WHO regions.[1]

Like many developing countries, Pakistan is struggling with various health-related issues and has one of the poorest mental health indicators. Mental health in Pakistan is complicated by a plethora of economic, sociocultural, and religious factors, and it is further marred by a limited workforce. Higher rates of mental illnesses lead to a higher risk of completed suicides. Suicide is an understudied subject in Pakistan, which does not have a national suicide registry, neither are the suicide data reported to WHO. This lack of national statistics, along with punitive laws, religious disapproval, and the associated social stigma, makes it difficult to obtain representative data.[2]

In Pakistan, when a suicide takes place, it is recorded in the local police station. The police are required to conduct an enquiry including an autopsy and histopathological and chemical examination of viscera and body fluids in local forensic medicine departments/Medicolegal centres for determining the exact cause of death. Autopsies or post-mortem examinations although are a common practice in the Western healthcare system for confirming the cause of death, but families in Pakistani context due to religious and cultural beliefs and norms around death rituals, do not accept the concept of autopsy of deceased readily in clinical as well as medicolegal cases.[3] Therefore, in practice, in most cases of suicide deaths, only an inquiry into circumstances of the act (which may comprise interviews of family members) is done. On the basis of the gathered evidence, the cause of death is labeled as suicide.

Research into the methods of suicide and effective interventions has shown promising results.4 However, as suicide is considered a shameful act due to various religious and sociocultural beliefs, it is often concealed and is not reported to police due to stigma faced by the families.

Consequently, number of autopsies carried out in suicide cases in Forensic departments/Medicolegal centres are gross underestimation to the actual number of deaths occurring due to suicide. Various studies in developed and developing

countries around the world have focused on postmortem audits of forensic suicides over extensive periods. In a retrospective 7-Year Forensic-Based Study in Iran, 181 cases of suicide deaths with 74% male death were investigated. Hanging followed by self-poisoning were the most often used methods. Aluminium phosphide was the most common poison detected.[5] An analysis of suicide autopsies (1654) conducted in Geneva University during twenty years period (1971-1990) noted male to female ratio of 1.5:1.6 The most common means of suicide chosen by men in the study were the use of firearms (28%) and hanging (21%) whilst women died by falling from a height (26%), poisoning (24%) or drowning (22%).

World Health Organisation emphasises countries to monitor suicide and use disaggregated rates by sex, age, and method. We conducted a study to analyse the suicide autopsies done during five years (2017-2021) in two large forensic medicine departments in two provinces of Pakistan to understand the demographics pattern and methods of suicide. To our knowledge, it has not been studied previously. This data provides some essential information for understanding the scope of the problem so that interventions for suicide prevention can be tailored to meet the needs of specific populations and can be adjusted to local trends.

SUBJECTS AND METHOD

This is a descriptive study of 98 fatal suspected suicide cases, brought for post-mortem examination at two large Forensic departments/Medicolegal centres in Punjab and Sindh (Forensic Medicine department, King Edward Medical University (KEMU)/Mayo hospital, Lahore, and Medicolegal section, Jinnah Postgraduate Medical Centre under Police Surgeon Karachi) for 5 years, from January 2017-December 2021. Following Institutional review Board approval from KEMU, demographic data (age, gender, residential location), method used, possible underlying factors for suicide (if available), and post-mortem toxicological findings were extracted from forensic reports available and were entered into a pre-designed questionnaire based on previous studies.[5,6] Toxicological analyses according to available reports were performed using gas chromatography equipped with nitrogen phosphorus detector, gas chromatography/mass spectrometry, ELISA and calorimetric techniques alongside histopathological examination of viscera, however only few reports were available. Statistical analysis was done by SPSS version 26. The frequency and percentages were calculated for all categorical variables. Chi -square test was used to assess any statistically significant differences in methods of suicide among genders and different age groups as well as both study sites in 2 provinces. P value <.05 was considered as significant.

RESULTS

A total of 6510 cases were autopsied in 5 years (3825 at the KEMU/Mayo hospital mortuary and 2685 in JPMC). Of these 98 (1.5%) autopsy cases were due to suspected suicide. Yearly distribution of suicide autopsies was 19 in 2017, 22 in 2018, 10 in 2021, while 28 and 19 autopsies were conducted in 2019 and 2020, respectively.

Among them, the majority (67, 68.3%) were male and belonged to urban areas (91, 92.9%). Mean age of persons who died by suicide in current study was 30.63 (SD=13.10). Among the suicide deaths, the youngest was 14 years, and the oldest was 79 years. Fifty-seven percent of suicides were under the age of 30. Possible motives for suicides were mentioned only in 44 reports. These include poverty (15), domestic problems (8), Parental refusal to marry a person of choice (5), failure in love affairs (5), failure in exams (5), mental illness (5) and unemployment (1).

The most often used suicide method was hanging (41,41.8%) followed by use of firearms (23, 23.5%). Self-poisoning was the method used in 11 (11.2%) deaths. Six people died by jumping from heights, 4 persons used sharp instrument to cut their throat, whereas 3 people each died from suicide by self-immolation, jumping in front of moving train and jumping in rivers, respectively. Aluminium phosphide (present in the wheat pill) was detected in six self-poisoning cases and Pheniramine (antihistamine) in one case. Significant differences were noted regarding the method of suicide among gender and different age groups as well as different study centres (Table).

Table
Comparison of Suicide of Suicide Methods among Genders, Age groups and Study centres (N=98)

Method of suicide	Gender N (%)			Age Groups N (%)			Study Centers N (%)		
	Male (n=65)	Female (33)	P-Value	Upto 30 years (56)	>30 years old (42)	P-Value	Lahore, Punjab (51)	Karachi, Sindh (47)	P-Value
Hanging	26(39.9)	15(45.4)		22(39.2)	19(45.2)		30(58.8)	11(23.4)	
Firearms	23(34.8)	0(0.0)		5(8.9)	18(42.8)		11(21.6)	12(25.5)	
Ingestion of poisonous substances	5(7.6)	6(18.4)	.004*	10(17.9)	1(2.4)	.035*	4(7.8)	7(14.9)	.001**
Self-immolation	2(3.0)	1(3.0)		2(3.6)	1(2.3)		3(5.9)	0(0.0)	
Jumping from Heights	4(6.1)	2(6.0)		3(5.4)	3(7.1)		0(0.0)	6(12.7)	
Others (Jumping in front of moving train, drowning in river, Use of sharp knife, unclear documentations)	5(9.1)	7(22.6)		9(16.1)	5(11.9)		4(5.9)	11(23.4)	

Note: p value >.05*, p value >.001**

DISCUSSION

To our knowledge, this is the first autopsy-based study in Pakistan analysing the suicidal deaths. While analysing the results, it is important to bear in mind that information provided in the autopsy reports was certainly limited and far from satisfactory. Despite these shortcomings, the study highlights important findings.

Ninety-eight suicide autopsy cases over 5 years (2017-2021) in two large forensic medicine departments/ Medicolegal centres in capital cities of two provinces have been analysed in this study. The low autopsy rate does not accurately depict the actual burden of death by suicide in our country. This low rate can be attributed to Pakistan's social and cultural norms and the commonly held religious ideas.[3,7] In Pakistan, when the cause of death has been ascertained, often the families do not file the First Information Report (FIR) and avoid court proceedings. Even hospitals sidestep reporting such incidents to the local police, fearing lengthy legal proceedings. Many people in Pakistan refrain from post-mortem examination and prefer early burial because of their religious belief. As it is considered disrespectful culturally as well as religiously, the compliance level of getting females autopsied is even lower.[7]

Our study's sample showed that the suicide deaths were significantly more in males (68.3%). Difference in suicide death incidence between genders is comparable to international data, which describes a gender paradox in suicide in which males have been found to have a disproportionately lower rate of suicide attempts, but an excessively higher rate of suicides compared to females.[8]

Globally, the age-standardised suicide rate is noted by WHO to be 2.3 times higher in males than in females.[1] In our culture, where gender roles and social conditioning don't allow men to open up about mental issues, the male population is perhaps at greater risk of not getting the help when needed. Furthermore, large families often have single breadwinners, which can be very draining for the person responsible.[9] All these factors may make the male faction particularly vulnerable to mental illness and choosing suicide as a resort. Suicides are under-reported in Pakistan and the ones that are reported rarely make it to autopsy unless there is a high likelihood of foul play. This attitude is amplified at the rural level, which could be one of the contributing factors to the urban-rural disparity seen in our study.

Study results indicated that most victims (57%) were below 30 years of age. This finding is similar to the findings of previously conducted studies in Pakistan showing higher prevalence of suicidal behaviours in individuals below 30 years of age.[10,11,12] Suicide among youth is a major concern, especially in Low- and middle-income countries, where most of the world's population lives.[1] Suicide in young people is estimated to contribute 6% to global mortality.[13] Thus, it is important to address possible underling factors like parental conflicts, academic stress, abuse, bullying, etc. and design suicide prevention strategies focusing on youth in our setup.

The most common method of suicide in the current study sample was hanging, followed by firearms and poisoning. This is well in line with the existing literature from Pakistan reporting hanging, poisoning and firearms, accounting for the most common means of suicidal behaviours.[10,14] However, in comparison to earlier studies,[15] there has been a significant increase in the use of firearms, which reflects the fast-growing problem of firearms availability in Pakistan over the past few years. Firearm ownership is associated with a greatly elevated risk of suicide by firearm.[16] We noted that in six out of 7 poisoning cases, where chemical analysis reports were available, aluminium phosphide (pesticide) was detected. This is well in line with the existing literature that Pesticides self-poisoning account for up to 20% of global suicides.[17] It is one of the most commonly used means for suicidal behaviours especially in LMIC due to easy accessibility for agriculture farming.[17] According to WHO, pesticide ingestion accounted for over 60% of suicides in China and South East Asia in 2001.[18] The study findings about methods of suicide are important for suicide prevention strategies by controlling the access to the means of fatal and non-fatal suicides.

According to previous studies, different regions and countries have different popular suicidal methods. Trends in these methods may change with time as new methods of suicide emerge and the accessibility of some becomes difficult.[19] The selection of suicide method is known to be affected by various factors, both at the compositional (e.g., age and gender) and the contextual level.[10,20,21] High accessibility, such as specific drug use, firearm ownership, and occupational drug use, also acts as predictive factors for suicide methods. Regardless of gender, hanging was the most commonly used method in our study's sample (52.6% in males and 69% in females). This figure is concerning since this method isn't particularly amenable to restricted-access prevention approaches, given that hanging materials are widely available. Prototypes of ceiling fans having weight-bearing limits are underway, but it will take time for their development, replacement of classic fans, and finally seeing their statistical impact on suicide.[22]

We noted statistically significant differences method of suicide among gender in our study. There was no death by firearms in women, and hanging was significantly higher in males. The degree of suicidal intent can govern the choice of a violent method instead of a non-violent method of suicide. Men are more inclined to use methods that take them to the point of no return, such as use of firearms or jumping from a height. Females in comparison usually go for non-violent methods like poisoning in which intervention may be able to revive them. There has been a wide range of explanations for this behaviour, including the stronger intent to die, being less avoidant of disfiguring wounds, and biological factors such as lower brain serotonin levels.[23] Research has linked old age with the use of highly lethal methods, which was noted in our sample too with the use of firearms predominantly by age group> 30 years.[24]

Although very few reports mentioned possible immediate proximal factors to suicide, but it appears that poverty, family conflicts, difficulties in relationships, interpersonal and academic stress, and mental illness may all be important factors that lead to suicide as reported in previous studies in Pakistan.[12,14] However, it is important to emphasise that there is usually not a mono-causal explanation for suicide and depression and other mental illnesses, one of the highest risk factors for suicide, often remains underdiagnosed in LMICs.

As our research is the first of its kind in Pakistan, the results must be viewed keeping in mind certain limitations. Data were extracted from retrospective autopsy records with inherent limitations, such as incomplete records, poor documentation, and inability to establish any causal effect. Data also lacked information about the socio-demographic and psychosocial details of the victims as well as the history of any contact with mental health services. Data is from two centres with a small sample size and findings may not be generalisable to rural areas.

Despite the shortcomings, study has various strengths. We obtained data from two major forensic medicine department/ medicolegal centres in the capital cities of two provinces, giving insight into differences in pattern and methods used in different cities. Efforts were made to gather information from official autopsy and Pakistan forensic science agency (PFSA) reports, both highly credible sources.

Our study has important implications for suicide prevention in Pakistan. Depression, the leading cause of suicides, is a treatable illness, and tangible steps are required to address stigma and access to care. Although awareness of mental health issues is increasing, it is a concern, that greater part of the community always seems to be in the denial mode and fail to understand that common mental illness like depression and anxiety constitute a substantial proportion of the global burden of disease. Suicide preventive strategies need to be designed to restrict access to lethal means of suicides like banning the highly toxic pesticides.[25] It is important for policymakers to remain vigilant to the changing trends of suicidal methods and the emergence of new ones. Given higher suicides in young people, life skills trainings for young people in educational institutions, development of screening tools to identify at risk population with psychosocial interventions, use of social media in suicide prevention campaigns may help.

Mental health problems and interpersonal relationships are some of the major factors leading to suicide. Setting up helplines, promoting supportive and rehabilitation facilities for people undergoing suicidal thoughts can help prevent suicides. This would require stigmatisation regarding getting professional psychological and psychiatric help. Health care professionals, especially the ones in emergency services, should be trained to identify suicide risk cases and proactively collaborate with mental health services. Responsible media reporting of suicides with the aim of reducing imitation suicides and developing preventive practices and better attitudes related to suicide has been an endorsed suicide prevention strategy at the population level.[26] All these strategies need to be implemented locally, provincially and nationally so that in the future we can not only fill the gaps in data regarding suicides but also reduce the rate of suicidal attempts and suicide.

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