TRENDS AND PATTERNS OF SUICIDE IN PEOPLE OF CHITRAL, KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

OBJECTIVE: To examine suicide trends and patterns among people of Chitral District, Northern Pakistan; and to explore causes for suicide in this population.

METHODS: This cross-sectional study was based on information obtained from District Chitral, Khyber Pakhtunkhwa, Pakistan, regarding suicide deaths in this region which took place from 2007 to 2011. Data on 168 suicide victims was taken from 6 Tehsils in Chitral District, Pakistan, using the Cluster sampling technique. Primary data was collected from a pre-designed questionnaire and interviews of victims' families and other knowledgeable parties. The data was analyzed using SPSS version 16.0.

RESULTS: A total of 168 suicide cases were evaluated, that included 104(62%) women and 64(38%) men. Suicides rates were found to be more common in individuals aged 20-24 years. The main reasons behind the suicides were found to be family disputes (54%; n=90); lack of confidence and impatience (32%; n=54); mental health problems (14%; n=23); and failure in exams (11%; n=18). Lack of family support and care (8%; n=14) was also a common contributing factor. Drowning was the most common method of suicide among all victims (52%; n=87), followed by hanging (26%; n=43) and others.

CONCLUSION: In district Chitral, Pakistan, women had almost double the rate of suicide than men. Suicide was associated with family and marital issues, and the most common methods of suicide included were drowning and hanging.

KEY WORDS: Suicide (MeSH), suicide trend (Non-MeSH), patterns of suicide (Non-MeSH), Pakistan (MeSH).

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INTRODUCTION

Suicide is a major public health problem worldwide, responsible for many premature deaths. Over the last 45 years, the annual rate of suicide has increased by 60%. In some European countries and in China, suicide is the second-leading cause of death among 10-24 year-olds, and the third-leading cause of death among 15-44 year-olds. Suicide is also the 10th leading cause of death worldwide.[1] According to the World Health Organization (WHO), it is estimated that the low and middle income countries contribute to 85% of suicidal deaths in the world. However, less than 10% of the published research comes from these countries.[2]

In Pakistan, no official statistics about incidence of suicide are available and variable rates of suicide (0.43/100,000 in Peshawar to 2.86/100,000 in Rawalpindi) reported by Khan MM, is probably underestimates of original figures.[3] According to WHO estimates in 2013, age-adjusted rate of suicide in Pakistan is 9.3/100,000 population.[4]

Mir S, et al published research on depression and found that the prevalence of depression among pregnant women in one hospital in District Chitral, Pakistan, was 34%.[5] It was also determined that various factors were independently associated with depression in this population. Mumford et al, completed a study about two decades ago in which they screened and conducted psychiatric interviews on individuals living in two mountain villages in Chitral. They found that 46% of woman and 15% of men suffered from anxiety and depressive disorders.[6]

In order to build on such limited knowledge, we pursued the following in our research: First, we chose to study suicide instead of depression, as suicide is the ultimate and final symbolization of depression. Second, we expanded the sample population from just one hospital or two mountain villages to the entire District of Chitral to obtain a more comprehensive understanding about the pattern of suicide. Finally, in addition to determining the prevalence of suicide, we searched for trends associated with suicide, including reasons for committing suicide and methods used. The objectives of this study were two-fold: First, to examine suicide trends and patterns among people of Chitral District in Northern Pakistan; and second, to explore different causes responsible for suicide among the

people. Our study will allow the mental health community to increase its knowledge of the epidemiology of suicide in Chitral and thereby help formulate policy and develop strategies to prevent suicidal deaths.

METHODS

This was a community based cross-sectional study in the entire District Chitral, Khyber Pakhtunkhwa, Pakistan. 168 cases were taken out of 300 suicidal cases through a software "SAMPLE SIZE CACULATOR" function with a 95% Confidence Interval and a 5% coefficient.

Ethical approval for the study was obtained from Research and Developmental Department, Office of Institute of Management Science (R&DD Office of IMS), in Peshawar, Pakistan, in order to get permission from the local authorities for data collection. Consent forms were signed from participants before the interview was conducted.

All cases of suicide from 2007 to 2011 of individuals between the ages of 10 and 50 years which took place within the geographical boundaries of Chitral were included in the study.

Chitral is the largest district and it is divided into 6 (six) sub-districts. It has a population of 450,0005 and it covers an area of 14,850 km^2.[7]

It was not possible to study the whole population of Chitral due to resource constraints like limitations on time and money. Therefore; the cluster sampling technique was used for a random selection of cases. Fifty four villages were randomly selected out of 523 villages from eighteen (18) valleys in the region. Samples of 28 cases were taken from each of six Sub-Tehsils, including both urban and rural areas in Chitral district, making a total sample of 168 suicide cases in Chitral District.

Primary data was obtained through pre-designed and pre-tested questionnaires. Questions were asked of participants in their local language. Questions were asked from relatives of the victims, hospital staff, police officers and local NGO members. Because of limited resources and difficult terrain, it was not possible to approach each relative of the deceased victim. Therefore; 80% of the information obtained was taken by survey from relatives of the deceased, and the remaining 20% of the data of unapproachable areas were taken from the other sources as indicated. Secondary data was collected through literature reviews using the following databases: Cochrane library, PubMed, CDC and WHO website. The information was validated by reviewing various information sources available in the community.

Collected data were analyzed using SPSS version 16.0.

RESULTS

The following results were obtained regarding the suicide victims' personal health status. Of the 168 cases evaluated, about 62% (n=104) of the cases were women and 38% (n=64) were men. Women were more likely to commit suicide between the ages of 10-24 (70%; n=73), whereas men were more likely to commit suicide past the age of 24 (55%; n=35); Relative Risk 0.536 (95% CI 0.36-0.81; p=0.001). 67% of the suicide cases (n=113) were generally healthy, 30% (n=50) suffered some type of mental illness, and 3% (n=5) suffered from physical conditions. Only 9% (n=15) of victims' families indicated that there was a family history of suicides. Illegal drugs were reported in 24% (n=41) of victims.

Regarding personal demeanor, it was found that 28% (n=47) of the victims were aggressive in nature, 22% (n=37) were emotional, 21% (n=36) were sensitive, 21% (n=36) were calm, and 7% (n=12) were socially isolated. The evidence showed impatience and an aggressive nature contributed to higher rates of suicide among men than women (i.e. 41% vs 20%).

In terms of educational background and occupation, the following data were obtained. The suicide rate among educated individuals (primary and above) was only slightly higher than that among individuals who never went to school

TABLE I: METHOD OF SUICIDE USED BY THE DECEASED BY AGE

Age (years)	Method of suicide used by the deceased					Total
	Hanging (%)	Poison (%)	Drowning (%)	Gunshot (%)	Others (%)	
10-14	2 (22)	0	4 (44)	3 (33)	0	9
15-19	6 (15)	5 (12)	26 (63)	4 (10)	0	41
20-24	16 (31)	2 (4)	28 (54)	6 (12)	0	52
25-29	12 (52)	1 (4)	4 (17)	6 (26)	0	23
30-34	6 (55)	0	4 (36)	1 (9)	0	11
35-39	1 (17)	0	4 (67)	1 (17)	0	6
40-44	0	1 (8)	6 (50)	4 (33)	1 (8)	12
45-50	0	0	11 (79)	3 (21)	0	14
Total	43 (26)	9 (5)	87 (52)	28 (17)	1 (1)	168

TABLE II: REASONS FOR COMMITTING SUICIDE

Reasons of suicide	Frequency (n =168)#	Percentage (%)
Family disputes	90	54
Lack of confidence and tolerance	55	32
Mental health problems	23	14
Failure in exams	18	11
Lack of support and care	13	8

(48% vs 42%, respectively). However, the suicide rate among illiterate women was significantly higher than the rate among uneducated men (51% vs 27%, respectively); Relative Risk 0.51 (95% CI 0.30-0.81; p=0.002). The current study reveals that students and housewives have the highest rates of suicide (36% & 34%, respectively). Almost half of the suicide victims (48%; n=80) actively participated in daily activities, while only 6% (n=10) did not take interest in daily activities. About 62% (n=105) of the suicide victims were laborers, 20% (n=33) were officer workers, 9% (n=15) were unemployed, and 5% (n=9) lived overseas. Poor socio-economic status was not found as a risk factor. Most victims (55%) belonged to middle class families, 39% came from low socio-economic status, and 6% came from the upper class.

Regarding parental support and involvement, the data revealed the following: Among the suicide victims, at the time of suicide, 61% had both parents alive, 13% had only their father alive, 7% had only their mother alive, 13% did not have either parent alive, and 6% had only their stepmother alive. The absence of parents and/or a stepmother was found to be a factor that caused some individuals to attempt suicide. 60% (n=101) of the suicide victims had both parents illiterate. In 55% of the cases, the parents were either aggressive or ignorant of the problems of the victim, instead of supporting them.

The marriage status and related variables associated with marriage affected suicides thusly. Suicide was equally common among single and married individuals (45% vs 48%, respectively). A total of 59 victims were married: 75% (n=44) had arranged marriages, 22% (n=13) had forced marriages and 3% (n=2) married by choice. About 58% (n=34) of the married victims were under 18 years of age at the time of marriage. Almost 87% of the victims lived in joint family homes. Among the close family members of married victims, the following had the most negative attitudes to the victim: mother-in-law (58%; n=34); husband (46%; n=27); brother or sister in-law (42%; n=25); and father-in-law (37%; n=22).

The method of committing suicide differed depending on age and gender (Table I). Drowning was the most common method of suicide in all age groups except 24-35 years, where hanging was more common. Women were more likely to use outdoor methods to commit suicide as opposed to indoor methods (61% vs 39%, respectively), whereas no such difference was found among men.

Family disputes (54%) and lack of confidence and tolerance (32%) were the most common reasons for committing suicide (Table II).

Common suggestions given by the study participants for preventing suicide include guidance and support by the families (37%; n=62), awareness programs in the community (26%; n=43), counseling and treatment of mental issues (18%; n=31), and proper investigation of suicide cases by the authorities (11%; n=19). 5.4% of the participants recommended stopping forced marriages. And 1.8% suggested future research on suicide in the Chitral area.

These are valuable suggestions and are not impractical and we recommend they be pursued.

DISCUSSION

Our results indicate that females had a higher rate of completed suicide than males. We found the male-to-female suicide ratio to be 0.6:1. This result is in contrast to the ratio generally found in Western countries, where the completed male-to-female suicide ratio is frequently greater than 2:1, and commonly greater than 3:1.8 The majority of studies from different countries show higher rates of attempted suicide among females than males. Data from Asian countries like China, India and Asian Islands shows lower male-to-female completed suicide rates of 0•81, 1•10, and 1•48, respectively.[9]

Our results were generally different from results found in Pakistan and/or surrounding regions. In contrast to our results, a study on suicides in Karachi found that 83% of suicides were completed by men, while 17% were completed by women, yielding a 4.9:1 male: female ratio.[10] Our results were also different than the results published by the World Health Organization (WHO) in their "Disease and Injury Regional Estimates, 2000-2011," where the male: female suicide ratio in the Eastern Mediterranean Region (which includes Pakistan and Afghanistan) was found to be 1.42:1.[11] Recently published scoping review showed that that more men commit suicide than women in South Asian countries. However, this trend was different in Bangladesh, which had a male: female ratio of 0.43:1.[12] As such, the results of our study coincide with the results found in Bangladesh. Our results were also unlike those found from a study of suicides in Pakistan from 1985-1999, where the male: female suicide ratio was 2.5:1 (1,842 males: 725 females).[13]

Our results indicate that the 20-24 year old age range was the most susceptible to suicide. These results agree

with those from a study of suicide in six Pakistani cities, which found that 20-40 years was the age group with the majority of suicides.[3]

The present study findings are comparable to the others studies that Asian females (62%) higher rate of completed suicide than males and aged 20-24 years are higher rate of suicide (31%) follows 15 to 19 years (24.4%) among all other age groups.

The age range we observed in Chitral for women most susceptible to suicide overlaps with that found in a study which synthesized suicide data from six South Asian countries.[12] In the South Asian study, researchers found that women in the 15-29 year age group were particularly affected by suicide.

67% of the suicide cases (n=113) in our study were generally healthy, 30% (n=50) suffered some type of mental illness, and 3% (n=5) suffered from physical conditions. In comparison, in the Khan et al study, 96 of 100 suicide victims were assigned an ICD-10 principle diagnosis, while only 6 of 100 controls were given the same diagnosis (McNemar test, $P < 0.001$).[10]

In our study, 9% (n=15) of victims' families indicated that there was a family history of suicides. This statistic was more than double that found in the study by Khan et al in which 4% of both the suicide and control group members (out of a sample of 100 individuals each) had a family history of psychopathology.[10]

Our study found that the suicide rate among educated individuals (primary and above) was only slightly higher than that among individuals who never went to school (48% vs 42%, respectively). In contrast, in the Karachi study, 21% of suicides vs 4% of controls had no formal education; 44% of suicides vs 51% of controls had completed 6-12 grades; 10% of suicides vs 32% of controls had graduate level or higher education.[10]

In our study, 9% (n=15) of the suicide victims were unemployed. In the case-control study in Karachi, 39% of the suicide victims had been unemployed, with only 10% of the control subjects being unemployed.[10] As such, more than four times as many suicide victims were unemployed in the Karachi study as opposed to our study.

In our study, we found that single and married individuals committed suicide at a similar rate (45% vs 48%, respectively). In contrast, in the Karachi case study, 24% of the suicide victims were married, while 11% of the controls were married. And 51% of the suicide victims were single, while 73% of the controls were single.[10]

Nearly 87% of the suicide victims in our study lived in joint/extended family homes. The Karachi study found that there was a greater proportion of individuals who lived in joint/extended families in the control group (66%) as opposed to the suicide victim group (62%).[10]

High suicide rate and marital conflicts are closely interrelated, especially in developing countries. In Pakistan, the wife is under the burden of the family's honor; she has to perform various roles; and she has to endure difficult situations, including physical violence.[14] Under these situations the married women's position becomes helpless which leads to suicide mortality and psychiatric morbidity.[15]

This study found that the suicide rate in married women was quite high (55%). Many of the wives were married before they were 18 years old, and 21.4% were forced into marriages. This pattern takes place because parents traditionally feel it is their responsibility to marry off their daughters as soon as possible. The girls are unhappy with their marriage partners, and therefore; they have difficulty maintaining a balance between personal and in-law responsibilities (56.7%), which leads to marital disharmony (37%) and family disputes (50%). The girl's parents do not support their daughter, and so the marital disharmony continues. Ultimately, the wife becomes helpless and hopeless. Her parents do not allow her to take a divorce, and she chooses suicide as her only option out of the unsolvable stressful situation.

In our study, drowning was the most common method of suicide among all victims 52% (n=87), followed by hanging (26%; n=43) and shooting with a gun (17%; n=28). Poisoning was used as a method of suicide in 5% (n=9) of all cases.

Although hanging was one of the most common methods of suicide in our study as well as in Karachi study (n=40; 40% of cases), drowning was not indicated as a method of suicide in the later, while in Chitral drowning was the most common method of suicide.[10]

In the study that examined suicides across South Asia, as well as in another study conducted only in Pakistan, poisoning and hanging were found to be the two primary methods used, albeit with variations in context.[12,16] Comparatively, in our Chitral study, hanging was also a common method of committing suicide; however, poisoning was one of the least common methods of committing suicide.

In our study, firearms were used in 17% (n=28) of the cases. This result is comparable to that found in another study in which 15% of suicides were committed by using firearms.[10]

Our study found that family disputes (54%), lack of confidence and tolerance (32%) and mental health problems (14%) were the most common reasons for committing suicide. In Pakistan, generally, the causes of suicide are relationship problems, domestic disputes, and financial problems.[17-19] Our Chitral study results agree with the results from Pakistan in general, but financial problems were not identified as a cause by any significant proportion of Chitral residents.

An interesting example of how the same social construct can have different psychological effects in different cultures is that of marriage. Marital issues were a significant cause of suicide in Chitral, as

well as in other suicide studies in Pakistan. On the other hand, marriage is generally a protective social construct in the West. In Pakistan, marriage – for women, especially – seems to be a significant source of stress, which results in high psychological morbidity and suicidal behavior.[20]

In our study, mental health problems were the reason for suicide in only 14% of cases. It is common for suicide studies in Pakistan to similarly have low rates of suicide for mental health reasons.[8] However, when researchers conduct psychological autopsy studies on suicide victims, they generally find that 80-100% of their sample had mental disorders, with depression being the most common primary diagnosis.[21-23] Therefore; it is important to be aware of the possible underestimation of distal factors of suicide at the expense of proximal factors. In low- and middle-income countries such as Pakistan, the reductionist model places the responsibility of suicide on the individual. Personal disappointments are seen as the reason why individuals attempt suicide.

This reductionist model focuses more on immediate proximal factors as the cause of suicidal deaths, while downplaying intermediate and distal factors, which may predispose an individual to attempt suicide when faced with proximal factors.[24] An example of an immediate proximal factor is a marital argument; an intermediate factor may be depression; a distal factor could be adverse social circumstances.

There are three reasons why psychological factors and psychiatric illnesses are not identified by researchers who study suicide. First, quite a few of the reports are formulated from data obtained from police or forensic medicine, and these data do not examine psychological factors in suicides.[10] Second, there is a significant stigma associated with mental illness. Third, adequate treatment resources are limited.[25]

Preventive strategies can minimize the risk of suicidal behavior and mortality. In addition to the recommendations, that were suggested by the relatives of victims, our own recommendations for preventive strategies to minimize the risk of suicidal behavior and mortality in Chitral include the following: Develop national mental health programmes. After 1978, the Italian Government started community-level mental health services and mental illnesses decreased by 33%.[26] Furthermore; tackle poverty, provide social support, increase employment and job security. These strategies reduced suicide rates in the Eastern Mediterranean region.[27] Further research must be conducted to identify risk factors associated with suicidal behavior and deaths and to obtain information for the development of preventive strategies.[28]

Programmes should be developed to increase the awareness of depression, domestic violence and early marriages among the community. Preventive measures such as psycho-education and community-based organizations have been found to be more effective than efforts at restricting access to means of committing suicide.[29]

The first and main constraint was the unavailability of information in the area. This is because the issue of suicide is given a low priority in District Chitral, and because suicide cases are not reported officially. Second, there were limited resources such as money, time and personnel constraints. Therefore; it was not possible to access areas with difficult terrain, and as a result it was not possible to collect all the data from the entire district. Third, it is likely that our questionnaire did not accurately capture the distal factors of suicide. In our study, our primary data (questionnaire and interview data) was obtained from victims' family members, hospital staff, police officers, and NGO members. The victim's families or the investigating agencies are not knowledgeable in psychological and proximal factors that lead to suicide.[30] Therefore; it is likely that our results underestimate other factors that result in suicide. As our study has shown, marital issues, including early marriage age for girls and marital disharmony, are a significant proximal cause of suicide for girls/women. As such, there is a strong need to address the risk factors of marital issues and the stress that women experience in their lives.[29] In addition, further research should be conducted in order to capture the proximal and distal factors associated with suicide in Chitral more accurately, and therefore; possible methods of prevention of suicides therein.

CONCLUSION

The current study shows that women had almost double the rate of suicide than men in Chitral District. Suicide was associated with family and marital issues, and the methods of suicide included drowning and hanging. Suicide causes a large number of premature deaths in Chitral District, especially during the young and productive age groups. It is therefore; extremely important to pursue further research studies on suicide deaths as well as develop preventive interventions. Following these and other recommendations mentioned in our study will allow us all to decrease this serious public health issue.

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CONFLICT OF INTEREST

Authors declared no conflict of interest

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

ZA: Concept & study design, acquisition of data, final approval of the version to be published

QN & AWY: Acquisition, analysis/interpretaion of data, Drafting the manuscript, final approval of the version to be published

SK: Critical revision, final approval of the version to be published

JC: Drafting the manuscript, final approval of the version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.