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Investigating the Characteristics of Suicide And its Relationship with Family History of Suicide

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Abstract

Background: Several factors contribute to suicide attempts. To the best our knowledge, there is no study has been conducted to investigate the impact of a family history of suicide on suicide attempts.
Objectives: This study aims to examine the characteristics of suicide and its association with a family history of suicide.
Materials and Methods: This historical cohort study was carried out on individuals admitted to Shahid Beheshti Hospital in Taft and Shah Wali Hospital in Yazd for suicide attempts between 2018 and 2019. The study examined 73 individuals with a family history of suicide and 332 without such a history. It recorded demographic details, methods of suicide attempts, and family histories concerning the patients' mothers, fathers, and siblings. Data were collected and subsequently analyzed using ndependent *t*-tests, Mann-Whitney tests, chi-square and Fisher's exact test. A significance level of $P < 0.05$ was considered.
Results: The average age of the subjects was 28.02 ± 10.8 years, with 295 (72.8%) of the participants being women. There were no significant differences in mean income (P = 0.99), marital status (P = 0.06), gender (P = 0.35), place of residence (P = 0.06), and education level (P = 0.37) between individuals with and without a family history of suicide. Furthermore, our results indicated that the prevalence of mental illness was significantly higher in individuals with a family history of suicide ($P < 0.001$). The average number of suicide attempts was 1.05 ± 1.90 for those with a family history and 1.21 ± 0.50 for those without, a difference that was statistically significant (P = 0.002). The timing, method, and reasons for suicide attempts were not associated with a family history of suicide.
Conclusions: A family history of suicide was associated with an increased number of suicide attempts. There was no correlation between family history and gender, occupation, place of residence, number of children, timing of suicide, method of suicide, reason for suicide, and educational status of the patients. However, a significant relationship was found between a family history of suicide and a history of mental illness among the patients, indicating a higher prevalence of mental illness in the group with a family history compared to those without.

Keywords: Suicide, Family History, Suicide Methods, Risk Factors, Sociodemographic Factors, Psychology

1. Background

Today, deep social and cultural changes and transformations in the context of societies, on the one hand, and on the other hand, the relative level of differences in the educational and educational practices of families towards their children in recent decades have caused mental and emotional challenges for those people. Despite these changes and the pressures stemming from adverse upbringing conditions, many struggle to achieve their inner aspirations for a better life. This internal conflict particularly affects the younger generation, exacerbated by coercive familial dynamics, potentially leading to high-risk behaviors such as suicidal ideation and self-harm (1). Notably, suicide ranks as the third leading cause of death among adolescents in the United States (2), and globally, it is among the top eight causes of mortality, claiming the lives of nine individuals per 100,000 annually (3). Suicide is a multifaceted phenomenon influenced by various factors (4). Evidence

underscores its persistence as a leading cause of death among youth, with rates on the rise (5). Recognizing its significance, the World Health Organization (WHO) identifies suicide and self-harm as paramount concerns for mental and social health.

Various studies conducted in developed and developing countries have highlighted adolescent suicidal behavior as a significant public health concern. Individuals who contemplate suicide often perceive a lack of fulfillment in their life goals and desires, viewing death as preferable to continued existence. The research underscores the varying role of family dynamics in suicide, with parental suicidal ideation or history of suicide being strong predictors of suicidal behavior in offspring. Both genetic and environmental factors contribute to the transmission of familial suicidal tendencies, underscoring the importance of identifying such patterns in individuals who attempt suicide to facilitate appropriate therapeutic interventions aimed at preventing future occurrences (6). Evidence suggests a heightened risk of suicide among individuals exposed to parental suicide before the age of 17. Specifically, studies indicate that the death of a same-sex parent due to suicide elevates the risk of suicide in teenage children, with a notable association between paternal suicide and suicide in male adolescents was significantly associated with the history of father's death due to suicide, and on the contrary suicide in female adolescents was significantly associated with the history of mother's suicide (7). Moreover, a family history of suicide has been shown to increase the likelihood of suicidal ideation in individuals (8). Investigations in Iran reveal an upward trend in suicide rates over recent decades. A comprehensive study analyzing Iranian forensic medical data from 2016 to 2018, encompassing 9021 suicide cases, identified gender, marital status, and age as significant factors influencing suicide (9).

Despite the abundance of research on the factors contributing to suicide in Iran, our findings indicate a gap in the literature regarding the impact of family history of suicide on individual suicide in Iran.

2. Objectives

This study aims to compare suicide dimensions among individuals with a positive family history of suicide to those with a negative history.

3. Materials and Methods

3.1. Settings

Patients admitted to Shahid Beheshti hospitals in Taft and Shah Wali hospitals in Yazd between 2018 and 2019 due to suicide were included in the study. This study received approval from the Yazd University of Medical Sciences ethics committee (ethics committee code: IR.IAU.YAZD.REC.1399.053).

3.2. Study Design

This study utilized an analytical, historical cohort method. After explaining the study's objectives, all patients were requested to provide written informed consent to participate. Patients who declined participation were excluded. Seventy-three patients with a family history of suicide (exposure) and 332 patients without such history were included as the non-exposed group, based on the maximum available facilities.

3.3. Data Collection

A researcher-designed questionnaire was employed for data collection, encompassing demographic details (age, gender, occupation, marital status, education, income, place of residence, number of children), psychiatric history, suicide-related information (timing, method, and motive), and familial suicide history among first-degree relatives (mother, father, siblings, aunts, and uncles). Data were obtained from patients' medical records or through direct interviews. Questionnaires were completed by the study researcher at Taft Hospital.

3.4. Statistical Analysis

Following data collection, analysis was performed using the Statistical Package for the Social Sciences (SPSS) software version 16. Descriptive statistics, including central and dispersion tables and indices, were utilized. Qualitative data were presented as frequency and percentage. The normality distribution of quantitative data was assessed using the Kolmogorov-Smirnov test. Normally distributed quantitative data were expressed as mean and standard deviation (SD), while non-normally distributed data were presented as median and interquartile range. Independent *t*-tests and Mann-Whitney tests were employed for normally and non-normally distributed data comparisons, respectively. Chi-square or Fisher's exact test was utilized to compare qualitative findings between the two groups. A significance level of $P < 0.05$ was considered.

4. Results

Among the 405 individuals participating in the study, 73 had a family history of suicide, while 332 had no such history. The mean age of those with a family history was 26.78 ± 10.63 years, and for those without, it was 28.28 ±

10.79 years (P = 0.28). Of the study participants, 110 (27.2%) were male, and 295 (72.8%) were female. There were no significant differences in mean income (P = 0.99), marital status (P = 0.06), gender (P = 0.35), place of residence (P = 0.06), and education (P = 0.37) between individuals with and without a family history. Additionally, our findings revealed a significantly higher prevalence of mental illness among individuals with a family history of suicide ($P < 0.001$) (Table 1).

The mean number of suicides in people with a family history was 1.05 ± 1.90, and in people without a family history, it was 1.21 ± 0.50, which difference was statistically significant (P = 0.002). Time, method, and reason of suicide had no relationship with family history of suicide ($P > 0.05$) (Table 2).

5. Discussion

Our study revealed that among the variables examined, the prevalence of mental illness was significantly higher among individuals with a family history of suicide. Additionally, the incidence of attempted suicides was significantly greater in individuals with a family history of suicide compared to those without (1.05 ± 1.90 vs 1.21 ± 0.50, respectively).

Suicide and attempted suicide are significant public health issues and manifestations of antisocial behavior in both developed and developing countries. Apart from causing personal and familial harm, these phenomena pose social challenges. Suicide can be conceptualized as a deliberate act of self-harm with potentially fatal consequences (10). Statistics indicate that approximately one million deaths worldwide occur annually due to suicide. The motivations behind suicide vary among individuals and may include factors such as feelings of hopelessness, inappropriate mental and emotional states, substance abuse, financial difficulties, family conflicts—particularly extramarital affairs—and cultural factors (11). In this study, we aimed to compare suicide dimensions among individuals with positive and negative family histories.

Our findings demonstrated disparities in the incidence of suicide between the two groups studied, with a higher prevalence observed among individuals with a family history of suicide. Several factors may account for this discrepancy. Firstly, genetic factors may play a role in individuals with a family history of suicide (12). Secondly, it is possible that children from families with a history of suicide possess diminished problem-solving abilities and struggle to cope with challenges (13, 14). Moreover, such families may exhibit increased impulsivity and aggression, potentially contributing to elevated suicide rates among family members (14).

In our study, family history showed no significant association with gender, educational status, occupation, place of residence, number of children, time of suicide, method of suicide, or reason for suicide among patients. However, a notable relationship was observed between the family history of suicide and the psychiatric history of patients, with a higher prevalence of psychiatric history noted in the group with such a family history compared to those without. This finding aligns with the study conducted by Rostami et al. in 2017, which investigated the epidemiology of suicide in Khuzestan, Iran, from 2011 to 2014. Among the 11,180 recorded suicides, 60% were women, and 40% were men, consistent with our findings (15). Conversely, the study by Monsef Kasmaie et al. in 2012, aimed at analyzing the demographics of suicide methods in patients treated at the Gilan emergency room, reported that 57% of cases were men and 43% were women, showing inconsistency with our results (16). Additionally, contrary to our findings, some studies have indicated a higher prevalence of suicide in men compared to women (17).

A 2002 study demonstrated that a family history of suicide and psychiatric disorders significantly and independently increased the risk of suicide. It found that while a family history of psychiatric illness elevated the risk of suicide solely in individuals without a psychiatric history, a family history of suicide increased suicide risk for individuals both with and without a psychiatric history, irrespective of psychiatric illness (18). These findings were consistent with our study, where family history of suicide showed a significant association with patient's psychiatric history, with a higher prevalence in those with a psychiatric history compared to those without. Trémeau et al. proposed psychiatric diseases' history as a significant contributor to suicide, advocating for its special consideration in prevention and treatment efforts, a viewpoint consistent with our study (19).

Another study highlighted that, overall, a family history of suicide was linked to a heightened risk of suicide, increased mortality rates, repeated suicide attempts, and a greater number of attempts. It found that a positive family history of suicide was a risk factor for various characteristics of suicide independent of psychiatric diagnosis (20). However, these results differed from our study, where a family history of suicide demonstrated a significant association with a patient's psychiatric history, being more prevalent in those with a psychiatric history than those without.

Regarding the relationship between gender and suicide, Monsef Kasmaie et al.'s 2012 study revealed a correlation between gender and the method of drug

Table 1. Background Findings of the Studied Subjects by Having a Family History of Suicide

Variables: Study Group	Positive Family History of Suicide (73 Subjects)	Without a Family History of Suicide (332 Subjects)	P-Value
Age (y) [a]	26.78 ± 10.63	28.28 ± 10.79	0.28 [d]
Gender (men) [b]	23 (31.5)	87 (26.3)	0.35 [e]
Income mean (million tomans) [a]	1.07 ± 2.31	1.06 ± 4.31	0.99 [d]
Marital status [c]			0.06 [f]
Single	36 (49.3)	125 (37.7)	
Married	37 (50.7)	207 (62.3)	
Place of residence [c]			0.06 [f]
City	72 (98.6)	321 (96.7)	
Village	1 (1.4)	11 (3.3)	
Number of children [c]			0.37 [f]
First	25 (34.2)	96 (28.9)	
Second or more	48 (65.8)	236 (71.1)	
Positive history of mental illness [c]	48 (65.8)	130 (39.2)	< 0.001 [f, g]
Education [c]			0.37 [f]
Illiterate	2 (2.7)	14 (4.2)	
Elementary	19 (26)	73 (22)	
High school	48 (65.8)	201 (60.5)	
Bachelor's degree	3 (4.1)	38 (11.4)	
Masters-PhD	1 (1.4)	6 (1.8)	
Job [c]			0.21 [f]
Employee	4 (5.5)	13 (3.9)	
Manual worker	5 (6.8)	12 (3.6)	
Freelance	15 (20.5)	69 (20.8)	
Retired	0	4 (1.2)	
Jobless	20 (27.4)	58 (17.5)	
Housewife	17 (23.3)	116 (34.9)	
Student	12 (16.4)	60 (18.1)	

[a] Values are expressed as mean ± SD.
[b] Values are expressed as median (IQR).
[c] Values are expressed as No. (%).
[d] Independent sample *t*-test was used for the comparison.
[e] Mann-Whitney test was used for the comparison.
[f] Chi-square test was used for the comparison.
[g] Significant difference.

poisoning, with drug ingestion being the most common method, particularly among men (16). Additionally, research from New Zealand indicated that women tend to use drugs, particularly acetaminophen and antidepressants, more frequently than men in suicide attempts (21). These findings suggest that gender may influence the choice of suicide method, as individuals may gravitate towards certain substances or methods based on gender norms. For example, men may be more inclined towards drug ingestion or self-mutilation as a means of suicide due to gender-specific factors. Our study's findings were consistent with these results, as both groups—those with and without a family history of suicide—most commonly used drugs and poisons as methods of suicide.

Mivehyan 2016 study demonstrated a higher rate of suicide attempts among individuals with education levels below high school diploma, as well as among those with parents having educational backgrounds below diploma level, compared to those with diploma-level education or

Table 2. Comparison of the Frequency, Time, Method, and Reason of Suicide in People with and Without a Family History of Suicide [a]

Variables: Study Group	Positive Family History of Suicide (73 Subjects)	Without Family History of Suicide (332 Subjects)	P-Value
Suicide attempt frequency	1.05 ± 1.90	1.21 ± 0.50	0.002 [b]
Time of suicide			0.06 [c]
Day	24 (32.9)	149 (44.9)	
The night	49 (67.1)	183 (55.1)	
Suicide method			< 0.99 [c]
Jumping from height	0 (0)	1 (0.3)	
Drug poisoning	73 (100)	329 (99.1)	
Other	0 (0)	2 (0.6)	
Reason of suicide			0.09 [c]
Mental health problems	31 (42.5)	123 (37)	
Family disputes	53 (72.6)	208 (62.6)	
Financial problems	13 (17.8)	39 (11.7)	

[a] Values are expressed as mean ± SD or No. (%).
[b] Independent *t*-test.
[c] Chi-square test Fisher's exact test.

higher (22). This finding aligned with previous studies by Taziki et al., who reported a decrease in suicide rates among individuals with education levels beyond a diploma (23), and findings from Shiraz (24). However, our study's results were inconsistent with these findings, as the majority of patients in both groups—those with and without a family history of suicide—possessed a high school diploma.

Regarding the relationship between occupation and suicide, Mivehyan found that approximately 88% of suicide cases involved individuals who were unemployed or housewives (22). Similarly, studies by Azizpour and Sanei, as well as Akhtar Fasdoz, indicated a higher suicide rate among unemployed women (25), whereas research by Mousavi (25), Ahmadi (26), and Taziki et al. (23) suggested that housewives had a higher suicide rate compared to other occupational groups. In our study, the majority of patients in both groups—those with and without a family history of suicide—were housewives and freelancers, respectively.

5.1. Limitations and Suggestions

This study encountered several limitations. Firstly, not all patients consented to participate, potentially introducing selection bias. Secondly, the COVID-19 pandemic led to a reduction in hospital visits during the study period, resulting in a decrease in the number of suicide cases. Lastly, the study did not encompass all suicide cases within the designated period, and data from some clinics were not included, thereby limiting the generalizability of the findings. Future studies should aim to address these limitations for more comprehensive insights.

5.2. Conclusions

Based on the study findings, the incidence of suicide differed between the two groups examined, with a higher rate observed in the group with a family history of suicide. Family history showed no significant association with gender, occupation, place of residence, number of children, time of suicide, method of suicide, reason for suicide, or educational status of patients. However, a notable relationship was observed between a family history of suicide and patients' psychiatric history, with a higher prevalence among those with a psychiatric history compared to those without. Furthermore, suicide rates were higher among women than men. These findings provide valuable insights for policymakers in developing targeted strategies for suicide prevention. Implementing interventions aimed at youth, women, and families affected by suicide may prove to be cost-effective. Additionally, enhancing preventive measures such as screening programs for identifying at-risk individuals, restricting access to lethal means, raising awareness through educational initiatives, and improving access to high-quality mental health services should be prioritized and expanded.

Footnotes

Authors' Contribution: Study concept and design: Hamid Owliaey and Zanireh Salimi; analysis and

interpretation of data: Zanireh Salimi and Reza Bidaki; drafting of the manuscript: Razie Salehabadi and Raheleh Kadivari; critical revision of the manuscript for important intellectual content: Zanireh Salimi, Reza Bidaki, and Razie Salehabadi.

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Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after publication. The data are not publicly available

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Informed Consent: As the study was conducted on archived data, no consent was obtained from the study subjects. However, data were recorded using codes to protect the identity of the subjects.

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