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Suicide Ideation in Nursing and Emergency medical Students: Prevalence and Contributing Factors

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Abstract

Background and Aim: Nursing and emergency medical students face significant academic stress that may increase the risk of Suicide Ideation (SI). This study aimed to investigate the prevalence of SI and its contributing factors among nursing and emergency medical students at Alborz University of Medical Sciences.

Materials and Methods: This descriptive cross-sectional study, conducted as a census on 348 nursing and emergency medical students at Alborz University of Medical Sciences, Iran in 2024, utilized a demographic questionnaire and the Beck scale for suicidal ideation (BSSI). Data were analyzed using descriptive statistics (mean, standard deviation) and inferential tests (Mann-Whitney, Kruskal-Wallis), with multiple linear regression employed to examine variable relationships.

Results: The study found that 82.8% of participants had low risk for SI (SI), 14.9% had moderate risk, and 2.3% had high risk. Mean SI scores varied across academic programs, with the highest in continuous emergency medical technician bachelor's (3.6 ± 6.52) and lowest in nursing master's (1.8 ± 3.57). Over 30% reported tobacco use and 2.3% reported drug abuse, both significantly associated with higher SI scores ($P<0.001$). Marital status, gender, and year of study did not show significant associations with SI scores. A multiple linear regression model explained 36.1% of the variance in SI severity ($R^2 = 0.361$, $P < 0.001$), with history of SI, tobacco/substance use, mental disorders, recent stressful events, and economic status being significant predictors.

Conclusion: History of substance abuse, history of mental disorders, recent stress, poor economic status, and single-parent family structure were emphasized as factors influencing SI. An effective university-based prevention program should be based on combined psychological, social, and economic supports.

Keywords: Suicide Ideation, nursing, paramedicine, students.

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Introduction

Suicide Ideation(SI) is a significant concern in the field of public health, characterized by self-destructive behavior and suicidal thoughts. It is the main predictor of suicide attempts and occur across a spectrum of suicidal behaviors, ranging from fleeting thoughts to detailed planning[1, 2]. A significant comparison is to regard SI as the larger and often unnoticed portion of an iceberg, while suicidal behaviors represent the visible tip. This viewpoint highlights the importance of early detection and focused intervention for people experiencing SI to prevent the development toward actual suicide attempts[3].

Suicide is a significant and concerning behavior related to the health of students and is considered the second leading cause of death among this population group. Young people are highly vulnerable to suicide[4]. Emergency medical technicians and students are prone to post-traumatic stress disorder and SI due to their exposure to traumatic events, workload, and chronic stress[5]. Studies show that nursing students are more exposed to SI compared to students in other fields[6]. Nursing students, as future healthcare providers, face a unique combination of stressors that may increase their risk of mental health challenges, including SI. The demanding nature of nursing education, combined with exposure to human suffering and death, can create a high-pressure environment[7]. A study conducted in Taiwan found that 11.2% of nursing students seriously considered suicide as a coping mechanism for distress[8].

Furthermore, according to studies, being a non-native student, living in dormitories, and the resulting stress from the dormitory environment and separation from family are among the most significant factors affecting students' mental health[9]. Other studies also confirm that students are at high risk of depression and SI[10]. Factors such as academic workload, lack of sleep, financial pressures, and concerns about future career prospects can all contribute to psychological distress among nursing students[11, 12]. Furthermore, the prevalence of depression, anxiety, and stress among nursing students is a global concern that plays a role in SI[13]. In a systematic review conducted in Iran, the prevalence of SI among students was estimated to range from 6.2% to 42.7%, and suicide attempts ranged from 1.8% to 3.5% across different studies[14].

While studies have examined the prevalence of SI among students in various fields, there remains a need for research specifically focused on nursing and emergency medical students [15]. Data on SI and suicide among emergency medical students in Iran are very scarce. Nursing and emergency medical students face distinct challenges related to their curriculum, clinical experiences, and future professional roles. Therefore, understanding the specific factors involved in SI among nursing and emergency medical students is essential for developing targeted interventions and support services to promote the mental health and well-being of these students and ultimately reduce the risk of suicide in this vulnerable population. This study was conducted to investigate the prevalence of SI and the factors affecting it among nursing and emergency medical students.

Methods:

The present study is a descriptive cross-sectional study, in which 348 undergraduate

and graduate students from the nursing and emergency medical fields were examined in 2024 at Alborz University of Medical Sciences in Iran. Data collection was conducted through a census. Inclusion criteria for the study included being enrolled in one of the nursing or emergency medical programs and consenting to participate in the research. Exclusion criteria included withdrawal from participation and incomplete responses to the questions.

The data collection tool included a questionnaire on demographic information such as age, gender, academic semester, field of study, overall Grade Point Average (GPA), place of residence, positive history of SI and suicide attempt, history of tobacco and substance abuse, marital status, economic status, family type (nuclear, extended, single parent), and positive history of mental disorders. In addition, the Beck scale for suicidal ideation (BSSI) was used to assess the severity of suicidal ideation. This scale is a 19-item self-assessment instrument designed to reveal and measure the intensity of attitudes, behaviors, and planning related to suicide attempts in the past month. Each item is scored based on an ordinal scale from 0 to 2, with a total score varying from 0 to 38. The first 5 questions serve as a screening component, where the responses indicate the presence or absence of suicidal intent. If the respondent selects zero for question number 5, there is no need to continue answering; otherwise, the remaining 14 questions must be completed. The overall score interpretation is as follows: a score of 0–5 indicates low risk of SI, 6–19 indicates moderate risk of SI, and 20–38 indicates high risk of SI [16]. The test duration is 10 minutes. This scale has been translated into Persian and psychometrically tested in the general population [16]. Also, in Iran, the validity of the questionnaire was determined to be 0.76 through the concurrent criterion validity method and its reliability was determined to be 0.95 using the internal consistency method (Cronbach's alpha) [17]. In this study, the reliability of the questionnaire using Cronbach's alpha was 0.83.

To collect data, the researcher, after obtaining the necessary permissions from the university and preparing a list of students from the faculty officials, proceeded with data collection. The research objectives were explained to the participants. Additionally, participants were assured about the confidentiality of their information, and to gain further trust for providing truthful information, students were reassured that the findings would be presented in aggregate form and there was no need to write their first and last names. Then, written consent forms, demographic questionnaires, and the BSSI were distributed among the participants. Students at high risk of SI were referred to the university counseling office. This study also has an ethics code from Alborz University of Medical Sciences with the registration number IR.ABZUMS.REC.1403.028.

In this cross-sectional study, qualitative variables were reported as numbers and percentages, and quantitative variables were reported as mean ± standard deviation. The Kruskal-Wallis test was used to determine the relationship between SI scores and economic status and family type. Additionally, the relationship between SI scores and gender, marital status, positive history of SI, positive history of substance abuse, history of mental disorders, and positive history of recent stressful events was assessed using the Mann-Whitney test. Furthermore, simple and multiple linear

regression were utilized to identify factors associated with SI. The significance level in this study was considered less than 0.05. Data were analyzed using SPSS software version 22.

Results

In this study, 348 students from nursing and emergency medical fields at various academic levels participated. The mean age of the participating students was 21 years (IQR: 20–23), and Their average GPA in previous semesters was 16.8 (±1.59) out of 20. The frequency distribution of the participants' gender shows that 179 individuals (51.1%) were male. The demographic characteristics of the participants are presented in Table 1.

Table 1: Demographic characteristics of participants

variables		frequency	(%)
Gender	F	169	48.3
	M	179	51.7
Marital status	Single	317	90.6
	Married	27	7.7
Economic status	Poor	40	11.5
	Average	264	75.8
	Good	44	12.7
Family type	Nuclear	312	89.1
	Extended	17	4.9
	Single-parent	19	5.4
Academic year	1st	123	35.5
	2nd	102	29.4
	3rd	75	21.6
	4th	46	13.3
Field of study	B.S. Nursing	249	71.1
	M.S. Nursing	18	5.1
	B.S. CEMT	61	17.4
	B.S. NCEMT	20	5.7
Suicide attempt history		20	5.7
Suicide ideation history		125	35.7
Tobacco history		107	30.6
Substance abuse history		8	2.3
Mental disorder history		55	15.7
Mental disorder	Mood disorder	27	7.7
	Anxiety	10	2.8
	OCD	9	2.6
	other	9	2.6

B.S: Bachelor of science
M.S: Master of science
CEMT: Continuous Emergency Medical Technician
NCEMT:Non-continuous Emergency Medical Technician
OCD: Obsessive Compulsive Disorder

The frequency distribution of participants in the study based on the BSSI scores shows that 82.8% (288 individuals) had low risk, 14.9% (52 individuals) had moderate risk, and 2.3%

(8 individuals) had high risk of SI. The mean (standard deviation) scores of SI among students in the nursing bachelor's, nursing master's, continuous emergency medical technician bachelor's, and non-continuous emergency medical technician bachelor's programs were 2.9 (5.3), 1.8 (3.57), 3.6 (6.52), and 2.5 (4.07), respectively. This indicates that the highest mean was for continuous emergency medical students.

More than 30% of the participants reported a history of tobacco use, and 2.3% also reported a history of drug abuse. The results of the Mann-Whitney test indicate a significant difference in the mean score of SI between individuals with a history of tobacco use and substance abuse and those without such a history (P<0.001). Additionally, the results of this test show a significant difference in the mean score of SI between individuals with a history of mental disorders and those without such a history, as well as between individuals who experienced a stressful event in the past month and those who did not (P<0.001)(Table 2).

Table 1: Association Between SI and Demographic/Psychosocial Variables

Independent Variable	**Statistical Test Used**	**Test Statistic**	**p-value**
Gender	Mann–Whitney U	U = 16998.00	0.034
Marital status	Mann–Whitney U	U = 4377.500	0.428
Economic Status	Kruskal–Wallis	H = 16.150	<0.001
Family Type	Kruskal–Wallis	H = 9.448	0.009
History of SI	Mann–Whitney U	U = 5175.500	<0.001
History of Mental Disorders	Mann–Whitney U	U = 4359.500	<0.001
History of Substance Abuse	Mann–Whitney U	U = 8721.00	<0.001
Recently experienced a stressful event	Mann–Whitney U	U=10342	0.005

The Kruskal-Wallis test showed that there is a statistically significant difference in SI scores based on economic status (P<0.001, df=2, H=16.15), such that the mean score of SI was higher in individuals who reported poor economic status compared to those who reported average or good economic status (Table 3).

Table 2: Distribution of frequency of SI according to economic status

Sample 1- Sample 2	Test Statistic	Std. Error	Std.	Sig.	Adj. Sig.[a]
Good- Average	30.981	15.369	2.016	.044	.131
Good - Poor	81.685	20.615	3.962	**.000**	**.000**
Average - Poor	50.704	16.014	3.166	**.002**	**.005**

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

The results also showed a significant difference in SI scores based on family type (P<0.05, df=2, k=9.44), with the mean SI score of 5.05 (±5.8) being higher in single-parent families compared to nuclear and extended families. Additionally, the results indicated that there was no significant difference in the mean SI scores based on marital status (p=0.177), gender (p=0.11), and students' years of study (P=0.14).

The multiple linear regression analysis indicated that the model explained approximately 36.1% of the variance in the severity of SI ($R^2 = 0.361$). The overall model was statistically significant ($p < 0.001$). The Durbin-Watson statistic (1.730) indicated no autocorrelation, and variance inflation factors (VIFs < 2) suggested minimal multicollinearity. Among the predictors, history of SI, history of tobacco and substance abuse, history of mental disorders, recent stressful events within the past month, and economic status (both average and good) were significantly associated with the severity of SI ($p < 0.05$). The findings also indicated that individuals with good and average economic statuses were 14% and 17.9% less likely to report SI compared to those with poor economic status, respectively (Table 4). Other variables did not show significant effects.

Table 3: Summary Statistics of Regression Model Predicting SI

Predictor	B	Beta	t	p-value
History of SI	4.984	0.438	9.113	<0.001
History of tobacco use	1.682	0.142	3.111	0.002
History of substance abuse	1.342	0.121	2.661	0.008
History of Mental disorders	2.166	0.146	3.149	0.002
Recent stressful event (past month)	1.242	0.105	2.350	0.019
Economic status (average)	-2.283	-0.179	-3.009	0.003
Economic status (good)	-2.315	-0.140	-2.324	0.021

Discussion

The present study examined the prevalence of SI and their related factors among nursing students. The findings indicate that while the majority of participants (82.8%) were at low risk for SI, a significant minority had moderate (14.9%) and high (2.3%) risk levels. Additionally, 35.7% reported a history of SI, and 5.7% mentioned a previous suicide attempt. The mean SI score was higher among continuous emergency medical technician undergraduate students compared to other fields and higher degree levels. The multiple linear regression model accounted for 36.1% of the variance in SI severity among nursing and emergency medical students ($R^2 = 0.361$), with significant contributions from prior SI, tobacco and substance abuse, preexisting mental disorders, recent stressful life events, and economic status. Notably, students reporting average and good economic status were 17.9% and 14% less likely, respectively, to

endorse SI than those in poor financial circumstances. These results are consistent with previous research showing that although most individuals in general populations report low levels of SI, a significant minority remain at higher risk[18, 19]. Moraes et al. (2021) found in a study conducted in Brazil that 53.3% of nursing students were at risk of suicide, of which 20.7% were at high risk. In addition, 22.67% reported a previous suicide attempt [19]. The results of a study conducted in Ghana in 2019 showed that the prevalence of suicidal ideation among nursing and midwifery students was 21.3%[20]. Shadnezhad et al. (2025) reported a prevalence of suicidal ideation among medical students in Urmia, Iran, of 17.7%. They concluded that specifically, 14.5% of students had experienced suicidal ideation, while 3.2% had been prepared to commit suicide [21]. Sadeghian et al. (2021) reported a prevalence of suicidal ideation among students at Tehran University of Medical Sciences of about 16% [22]. These results indicate that the prevalence of suicidal ideation varies according to time, place, and demographic conditions of students.

A key finding of this study is the significant association between SI and several risk factors, including a history of smoking and substance abuse, a history of mental disorders, and recent exposure to stressful events. These results align with previous studies that show substance use and mental disorders are among the strongest predictors of SI and behaviors[23,24]. The results of the study by Zinchuk et al. (2021) showed that a lifetime history of tobacco use is strongly associated with an increased risk of both suicidal and non-suicidal self-harming behaviors. Furthermore, it was found that tobacco use plays a role in the transition from SI to suicide attempts, and smoking may increase the risk of suicide through biological pathways such as reduced activity of the hippocampal serotonergic system, decreased brain serotonin function, and activation of the hypothalamic-pituitary-adrenal (HPA) axis. Therefore, nicotine may be able to trigger a poor HPA axis response to psychological stress [25]. The results of a study by Joulaei et al. (2024) in Iran showed that a history of mental disorders and high levels of stress and anxiety among medical students were factors associated with suicidal ideation[13]. Studies on the relationship between stressful events and increased SI also support the suicide stress-diathesis model, which assumes that acute stressors can trigger suicidal crises in vulnerable individuals[26]. Findings from a systematic review and meta-analysis showed that stressful life events were associated with a 37% greater likelihood of reporting future suicidal ideation and behaviors. These results suggest that the experience of stressful life events should be included in suicide risk screening, and suggest that suicide interventions could consist of developing resilience and adaptive coping to stressful life events [27].

Economic status emerged as another important factor, with individuals reporting poor economic conditions showing higher average scores of SI compared to those with moderate or good economic status. This finding is supported by existing literature that highlights the impact of economic hardships on mental health and suicide risk[28]. Poor economic situation may contribute to feelings of hopelessness and perceived burdensomeness, both of which are central concepts in contemporary suicide theories[29-30].

Family structure also played an important role, as individuals from single-parent

families exhibited higher levels of SI compared to those from nuclear or extended families. This observation aligns with studies showing that family disruption and lack of social support are associated with an increased risk of suicide, especially among adolescents and young adults [31]. The results of a recent study showed that individuals who were raised in single-parent families reported higher levels of anxiety and depression, which are major factors in SI [32]. This study found no significant differences in SI based on marital status or gender. The results of a recent study conducted in the city of Urmia among medical students confirm our findings [21], while some research has shown gender differences in SI and behaviors[33]. The absence of such differences in the present study may reflect the characteristics of the sample or cultural and contextual factors. Similarly, the lack of association with marital status suggests that other social or individual factors may play a greater role in this population. Years of education also did not have a significant impact on the development of SI. A recent study conducted in the Netherlands also showed that students' years of education were not significantly related to their SI [34].

Conclusion

This study illustrates the multiplicity of factors for SI and specifically the significance of substance abuse, mental health problems, recent distressing events, economic status, and family structure as important correlates. The results indicate that prevention and intervention should focus on these risk factors, particularly among students of poorer economic status and living in single-parent families. It is suggested that multilevel targeted interventions be designed at: 1. Designing screening programs to identify students with a history of substance abuse, mental health problems, or recent stressful experiences; 2. Social support: creating support networks for low-income economic status students or those with problematic family structures; and 3. Preventative education: creating personalised stress management and psychological resilience programs for high-risk groups at universities. Future studies should examine the mechanisms for these associations and identify protective factors that may mitigate risk. Second, it is important to investigate potential mediators of these relationships, including social support and coping mechanisms. Such relationships may inform tailored interventions to decrease suicide risk in medical students. Considering the cross-sectional study design, no causality can be drawn, and longitudinal studies are needed.

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Conflict of Interest:

The authors declare no conflict of interests.

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