Prediction of suicidal ideations based on socioeconomic status and mental health among University of Tabriz students

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Abstract

Introduction: The purpose of this study was to investigate the association of socioeconomic status and dimensions of mental health with suicidal tendency among students of the University of Tabriz, Iran.

Methods: The present descriptive and correlational study was conducted on 900 students of the University of Tabriz in the academic year of 2016-2017. The study tools included the Beck Scale for Suicidal Ideation (BSSI), Symptom Checklist-90-Revised (SCL-90-R), and Socio-Economic Status Questionnaire (SESQ) of Ghodratnama et al.

Results: Correlation results showed that depression (r = 0.514, P < 0.01), psychoticism (r = 0.478, P < 0.01), and obsessive-compulsive disorder (OCD) (r = 0.463, P < 0.01), respectively, had the highest correlation with suicidal ideations. Somatization was also correlated with suicidal ideations (r = 0.231, P < 0.05). Of the components of socioeconomic status, income (r = -0.401, P < 0.01), and the economic class component (r = -0.321, P < 0.05) had the highest correlation coefficients, respectively. Results of regression analysis indicated that the mental health variable predicted suicide in merely 58.6% of people. Moreover, with the addition of the socioeconomic status variable to the equation, both variables predicted an average of 71.6% of the overall suicidal ideations among individuals.

Conclusion: Results indicated that mental health difficulties and socioeconomic problems might have a negative impact on the development of suicidal thoughts. Therefore, it is highly recommended that students' mental health and social/financial problems be taken into consideration by educational managers responsible in universities, a mission that would be included in curriculum plans.

Introduction

Suicide can be defined as a deliberate action for self-destruction, with such goals as seeking attentions and eliminating mental strains, which may lead to death or recovery.[1,2] Suicidal ideations are defined as self-reported thoughts on suicide ranging from death wishes to a complete suicide plan.[3,4]

Suicide is considered as a major problem in most countries and imposes heavy costs on societies.[5,6] The incidence, patterns, and causes of suicide vary greatly from country to country; the success rate of suicide varies from less than 0.4 per 100000 people in Nigeria to more than 7.22 per 100000 in Switzerland.[7]

Studies have shown that one of the causes of suicide in developing countries is stressful social events.[8] Suicidal behavior can be considered as the result of a complex interaction of psychosocial and familial

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factors. Social changes that may have a relationship with suicide include family instability, marital conflicts, divorce, poverty, and unemployment.

Studies have shown that the causes of suicide attempts are different and can be classified into three areas of mental illnesses, social issues, and physical issues.[9] Family and economic problems, academic failure, marital discords, and romantic relationships between the youth could play a pivotal role in the development of suicidal thoughts.[10,11]

More than 40000 people in the world commit suicide annually, but it seems that this number does not include all the cases and due to the prevailing social, cultural, and religious attitudes in the countries, a high percentage of suicides are not reported.[8] Thus, suicide is a superior subject in mental health for the World Health Organization (WHO), and this priority is felt more in particular community groups due to their special conditions.[12]

University students are at the risk of developing mental disorders such as depression with suicidal thoughts. They are in the most active period of their lives seeking more gratifications, but facing barriers like separation from belongings, losing family supports, living in a dormitory, experiencing economic problems, being forced to achieve autonomy, having learning problems, and uncertain work future may make them feel unhappy.[13]

Mental disorders will increase the total burden of diseases up to 15% by 2020. It has been revealed that mental illnesses are not merely of biopsychological origin, but at the same time, have a social dimension in nature.[14,15] People undoubtedly have biological differences in terms of vulnerability to mental illnesses, but the issue is the extent of these differences which may be impacted by social determinants, and even more importantly, the individuals' perception of social situations.[16,17]

High socioeconomic status is associated with better health and longer life. In general, it can be stated that there is a direct relationship between the economic and social situations, and the health status of an individual in industrial societies.[18] University students are the potential human resources of a country by whom the future of a society will be constructed in the modern era. More healthy students will more likely have achievements.

Therefore, the purpose of the study was to investigate the prediction of suicidal ideations based on socioeconomic status and mental health among University of Tabriz students.

Methods

This was a descriptive and analytic study. The target population included about 20000 students of the University of Tabriz in the academic year of 2016-2017. Based on the Morgan table (n = 20000, S = 377) and considering a potential dropout rate, 900 students were chosen through a convenience sampling method. The participants signed an informed consent form and had the right to leave the study at any time. The study tools consisted of the Symptom Checklist-90-Revised (SCL-90-R), Socio-Economic Status Questionnaire (SESQ), and Beck Scale for Suicidal Ideation (BSSI).

SCL-90-R: The SCL-90-R is a screening tool for discriminating individuals with mental problems from healthy individuals. The SCL-90-R was developed by Derogatis et al., who reported the internal validity as a Cronbach's alpha coefficient of 0.77 and its reliability as 0.80-0.90 using the test-retest method.[19] In Iran, Anisi et al.[20] also reported a Cronbach's alpha of 0.75-0.92 for the subscales of the checklist and 0.98 for the general index. The SCL-90-R consists of 90 items which screen 9 symptoms including somatization, obsessive-compulsive disorder (OCD), interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. In the Discomfort Index (Single Disorder Marking), the total score obtained from the questions related to each disorder is divided by the number of questions related to the same disorder. In this way, the average score for each disorder is obtained. An average score of more than

2.5 for each disorder indicates that the person with a disorder has a significant problem. An average score of 3 or higher indicates that the problem is serious in relation to that disorder. In the General Symptom or General Indicator Symptom, all the scores derived from the respondents' answers to all the questions of the above list are grouped together, divided by the total number of questions, and multiplied by 100. An average score of 90-200 is indicative of a significant problem. An average score of more than 200 indicates that the individual has a serious psychological problem.

SESQ: The SESQ has 10 questions and includes 4 components (income level, economic class, housing situation, and education). It was developed by Ghodratnama at al.[21] The face validity of the questionnaire was assessed by 12 faculty members of Shahid Chamran University, Ahvaz, Iran, and its validity was calculated using factor analysis [Kaiser-Meyer-Olkin (KMO) coefficient = 0.752]. The reliability of the questionnaire was calculated using Cronbach's alpha (α = 0.72) during the preliminary study. This questionnaire is scores on a 5-point Likert scale ranging from 1 (very low) to 5 (very high).

BSSI: The BSSI is a 19-item self-assessment tool that is designed to measure attitudes, thoughts, and planning for suicide. It is a reliable and stable tool for measuring suicidal thoughts. Beck et al. reported a Cronbach's alpha of 0.90 for this scale.[22] In Iran, Anisi et al. reported the simultaneous validity of this scale with the general health scale as 0.76, and its validity as 0.95 using Cronbach's alpha.[23] The first five questions measure the desire of the subject to live or die, and include questions such as interest in life, desire to die or live, desire to save one's own life in dangerous situations, and the intensity of suicidal tendencies. Questions 6-9 deal with passive suicide, including questions such as the duration, frequency, acceptance, and control of suicidal thoughts. Questions 10-19 measure active suicide that has questions such as the basic cause of suicide, special suicidal plans, suicide methods or opportunities, the degree of certainty in committing suicide, the ability to commit suicide, the preparation process, planning events and issues after suicide, and informing others of the intention to commit suicide. Each question is scored on a 3-point scale ranging from 0 to 2 (0 = not at all, 1 = to a certain extent, and 2 = to a high degree).

The range of the total scores for the subscales of desire to die with 5 questions, passive suicide with 4 questions, and active suicide with 10 questions is 0-10, 0-8, and 0-20, respectively. The overall score of a person is based on the sum of subscale scores and ranges from 0 to 38; higher scores illustrate higher risk of suicide.

In order to analyze the research data, descriptive (dispersion indexes) and inferential (correlation method and multiple regression method) statistical methods were used If the purpose is to predict a criterion variable by multiple variables, a multiple regression model must be used.

Results
Subjects' characteristics: The present study participants were 900 students, including 506 women (56%) and 394 men (44%), with an average age was 24 ± 3.6 and the age range of 18-30 years (minimum of 18 years and maximum of 35). Of the completed questionnaires, 37 were dropped due to defects and incompleteness.

Moreover, 508 (57%), 286 (32%), and 105 (12%) students were in a bachelor's, master's, and PhD. program, respectively.

Moreover, 502 (56%) students assessed their socioeconomic status as low, 301(33%) as moderate, and 97 (11%) as high.

Descriptive statistics [Mean and Standard deviation (SD)] in suicide, mental health, and socioeconomic status in subjects: The descriptive statistics indexes (mean ± SD) related to suicide, mental health, and socioeconomic status were 66.5 ± 9.2, 53.10 ± 10.70, and 32.8 ± 7.5, respectively.

Table 1. Association between the Symptom Checklist-90-R (SCL-90-R) and Socio-Economic Status Questionnaire (SESQ) and suicidal ideations

SCL-90-R	R	P	SCL-90-R	R	P	SCL-90-R	R	P	SESQ	R	P
Somatization	0.231**	0.05	Depression	0.514*	0.01	Phobic anxiety	0.110	0.90	Income	-0.401*	0.01
OCD	0.463*	0.01	Anxiety	0.117	0.09	Paranoid ideation	0.98	0.14	Economic class	-0.321**	0.05
Interpersonal sensitivity	0.950	0.13	Hostility	0.109	0.11	Psychoticism	0.478*	0.01	Housing	-0.119	0.07

SCL-90-R: Symptom Checklist-90-Revised; SESQ: Socio-Economic Status Questionnaire; OCD: Obsessive-compulsive disorder
*It is significant at the level of 0.01. **It is significant at the level of 0.05.

Association between SCL-90-R component and SES component and suicidal ideations: Table 1 shows that among the related subscales, depression (r = 0.514, P < 0.01), psychoticism (r = 0.478, P < 0.01), and OCD (r = 0.463, P < 0.01) had the highest correlation with suicidal ideations, respectively. Somatization was also correlated with suicidal ideations (r = 0.231, P < 0.05).

Among the components of socioeconomic status, income (r = -0.401, P < 0.01) and economic class (r = -0.321, P < 0.05), respectively, had the highest correlation coefficients. That is, suicidal thoughts may increase in lower socioeconomic status.

Summary of regression model: According to the regression model summary presented in table 2, it can be said that in the first model, with the entry of the mental health variable in the regression equation, this variable alone predicts suicide in 58.6% of people. In the second model, the addition of socioeconomics in the equation of both variables predicts an average of 71.6% of the total suicide rate in individuals. Of the 71.6% of the variance, the share of mental health and socioeconomic status variables are estimated to be 58.6% and 13.0%, respectively, which were statistically significant (P = 0.01). In other words, the regression model is R Square = 71.6%. Mental health as one of the predictor variables in this research explains 58.6% of the dependent variable (suicidal ideations). Moreover, socioeconomic status as another predictor variable in this research explains 13.0% of the share of the dependent variable (suicidal ideations). In total, the two variables account for 71.6% of the share of the dependent variable. Accordingly, the regression model is suitable because in the regression model the observed values are closer to the fitted line that plot shows.

ANOVA: The results presented in table 3 show that the regression model can predict the changes of the dependent variable in a meaningful way, because the calculated F (57.7) value is statistically significant at P < 0.01.

Multiple regression between suicidal tendency and mental health and socioeconomic status: Table 4 shows the contribution of each of the independent variables in the prediction of the dependent variable. The results presented in table 4 show that mental health alone has a coefficient of 0.686 and with the entry of the second variable in the second stage, the share of mental health was 0.617, and socioeconomics has a coefficient of 0.522.

All independent variables of the research had a significant contribution of 99% confidence (P ≤ 0.01) in the prediction of the dependent variable.

Table 2. Summary of the regression model

Model		R	R Square	Adjusted R Square	Std. Error of Estimate	P
1	Mental health	0.654	0.586	0.561	9.91	0.01
2	Mental health and socioeconomic status	0.775	0.716	0.695	8.21	0.01

Dependent variable: Suicidal ideations

Table 3. ANOVA test

Model	Sum of Squares	df	Mean Square	F	P
Regression	4.418	1	4.418	57.7	0.01
Residual	1.377	18	765238.393		
Total	5.796	19	-		

df: Degree of freedom
Predictors: Mental health and socioeconomic status
Dependent variable: Suicidal ideations

Multiple linear assumptions were also studied in the column of variance inflation factor (VIF) and tolerance, and as a result, multiple linear correlations were not found between independent variables (tolerance values of 0.01 or less and VIF values of more than 10 indicate multiple linear correlations).
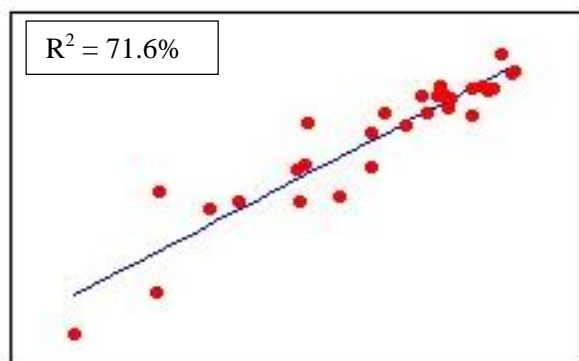

$R^2 = 71.6\%$

Observed responses

Figure 1. Plot of observed response versus fitted responses for regression model

Discussion

The purpose of the current study was to investigate the prediction of suicidal ideations based on socioeconomic status and mental health among University of Tabriz students. The results showed that mental health and socioeconomic status have a significant relationship with suicidal tendency. In addition, among the subcomponents of mental health, depression, psychosis, OCD, and physical component had the highest correlation with suicidal tendency, which were significant ($P < 0.01$).

Moreover, somatization had a significant correlation with suicidal tendency ($P < 0.05$). Furthermore, among the subcomponents of socioeconomic status, income ($P < 0.01$) and economic class ($P < 0.05$) had the highest significant correlation with suicidal tendency. On the other hand, regression coefficients show that mental health with a coefficient of 0.68 and socioeconomic status with a coefficient of 0.52 predict suicidal tendency, which were significant ($P < 0.01$). Moreover, in the first model of the regression model summary, with the entry of the mental health variable in the regression equation, this variable alone predicts suicide in 58.6% of people. In the second model, with the addition of socioeconomics in the equation, both variables predict an average of 71.6% of the total suicide in individuals. Of this 71.6%, the share of the mental health and socioeconomic status variables were estimated to be 58.6% and 13.0%, respectively, which were statistically significant for both variables ($P = 0.01$).

In this regard, the results of Zare et al. showed that depression, hypochondriasis, schizophrenia, and antisocial personality had the highest frequency in the case group.[24] They also found that physical diseases with the lowest percentages of 7.17% were among the 10 factors related to suicidal tendency, and other factors such as depression with 5.57% and marital status with 8.47% have higher percentages, which is in agreement with the results of this study.[24]

Table 4. Standardized and non-standardized regression coefficients of model variables

Model	Variables	Standardized B	Standard error B	B	P	Tolerance	VIF
1	Mental health	0.686	0.061	0.591	0.001	1	1
2	Mental health	0.617	0.056	0.532	0.001	0.973	0.028
	Socioeconomic status	0.522	0.069	0.363	0.001	0.973	0.028

VIF: variance inflation factor
Dependent variable: Suicidal ideations

In other words, the results of the research by Zare et al.[24] indicate that mental disorders are predictors of committing suicide.

In addition, the simultaneous presence of more than 10 suicidal factors, such as marital status, depression, use of drugs, and adolescence, is associated with high seriousness of suicidal attempts.

The results of the survey by Shafiee-Kandjani et al. showed that most attempted suicides were among individuals who were single and young, and had a under the diploma education and high school diploma, and, based on Millon's test-III, 79.7% of the individuals who attempt suicide suffered from at least one personality disorder among which depression is the first sign of an incompatible personality disorder in suicidal attempts in Iran.[25] The four incompatible personality disorders include major depressive disorder (MDD), histrionic personality disorder (HPD), clinical anxiety syndrome, and Depressive personality disorder, which are among the predictors of suicidal attempts.

Moreover, Chaudhary et al. showed that OCD is associated with high risk for suicidal behavior, and depression and despair have significant correlations with suicidal behaviors; this means a precise risk assessment for suicide risk and depression should be conducted for OCD patients.[26] The results of this study are consistent with the results of the present study which showed that OCD has a high and meaningful correlation with suicide tendency. Furthermore, Kim et al. found that 9.3% of individuals with suicidal thoughts had committed suicide.[27] After classification by age and sex, their results showed significantly higher rates of suicide attempts among unemployed young men and women with low education.[27] Moreover, the lowest income level was significantly related with suicide attempts in young women. This is consistent with the results of this study because in the current study the income and education level had a significant relationship with suicidal tendency,

and socioeconomic status significantly predicted it.

In addition, the results of the research by Rehkopf and Buka showed that societies with high socioeconomic status had the lowest suicide rates.[28] Poverty and deprivation in the environment (living area) are likely to be related to high rates of suicide. On the other hand, the relation of an average income and suicide rates are not significant. Suicide has an equal and inverse relationship with unemployment, education, and occupation, which is consistent with the results of this study.

In this regard, for explaining the results of this study, it can be said that, based on new behavioral theories, mental disorders lead to avoidance of participation in important individual and social activities, which lead to intensified passive behaviors and increased symptoms of mental disorders such as negative obsessive rumination, difficulty in thinking or concentrating and making decisions, feeling isolated and lonely, loss of pleasure, and lack of participation in enjoyable activities. These conditions also lead to self-criticism, a decrease in self-esteem, and an increase in negative emotions, and consequently, increased suicidal thoughts and suicide attempts. It should also be noted that the biological and neurological issues that underlie mental disorders in people are of the most important areas in the field of suicide-related abnormalities. For example, in mood disorders and schizophrenia spectrum disorders in which biological issues have high contribution rates, a high percentage of affected people commit suicide. It can be said that the major impact of these disorders is on the emotions, since they unbalance the emotional level, and therefore, lead to an increase in avoidance behaviors, anhedonia, high-risk behaviors, suicidal thoughts, and suicide attempts. In this process, suicidal behavior is a kind of maladaptive coping style to relieve the distress of diseases and environmental pressures of individuals with mental disorders.

Inadequate socioeconomic status reduces quality of life (QOL) indicators such as good physical function, general health, life and vitality, suitable social function, and mental health.[29,30] This leads to the occurrence mental disorders, because most mental disorders and their related symptoms have an inverse relationship with QOL indicators. Furthermore, it should be noted that students living with their families or in their homelands have fewer suicidal thoughts than students living in dormitories, who per se have fewer suicidal thoughts than those living alone.[31,32]

Limitations: The limitations of the study were the utilizing self-report tools for data collection and lack of use of clinical interviews. In addition, because the research population consisted of students, generalization of results should be done with caution.

Suggestions: Despite the complexity of suicide etiology, the prevention, recognition, and treatment of psychiatric disorders still play a key role in suicide prevention. This category should be prioritized by university authorities and the following necessary measures should be taken for prevention and treatment:

Implementation of native policy in universities that could be effective in reducing suicide rates among students

Improving the quality of university management and enhancing amenities at student dormitories

Providing necessary conditions to prevent, recognize, and treat mental disorders among students

At macro level, revision of economic policies and attention to job creation and specialization for university graduates in the country.

Conclusion

The results of this study indicated that mental health difficulties and socioeconomic problems may have a negative impact on developing suicidal thoughts. Therefore, it is highly recommended that educational managers responsible in the universities take into consideration students' mental health and social/financial problems, a mission that would be included in curriculum plans.

Conflict of Interest

Authors have no conflict of interest.

Ethical Approval

The study was approved by the regional ethics committee under the code number of IR. TBZMED. REC. 1396. 1260.

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