

# Predictive Factors for General Health Status in Iranian University Students; an Univariate and Multivariate Logistic Regression Analysis

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## Abstract

**Background:** Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Social, economic and cultural factors are main effective factors on person's health. As university students are the spiritual resources of each society and the future manufacturers of their own country, the present study aimed to determine the predictive factors for general health status in Iranian university students in 2014.

**Methods:** In a cross – sectional study, we assessed the predictive factors for general health status among 1066 university students in Ilam. A multi-stage sampling method were used. Data was collected by a two-part questionnaire. The first part of the questionnaire was included the personal characteristics. Second part of the questionnaire was General Health Questionnaire- 28 (GHQ-28). SPSS software Package 16 was used to analyze the data.

**Results:** The univariate logistic regression analysis shows that the variables such as age, gender, parental occupation, parental education, the family size, education field and education levels were different between the groups ( $P > 0.05$ ). With the multivariate logistic regression analysis age, gender, father's occupation and the family size were considered as independent predictive variables for university students' health status. The overall percentage of correct classification of the model is 65.7%.

**Conclusion:** The age, gender, father's occupation and the family size are main predictive factors for general health status in university students.

**Keywords:** General Health; Predictive factors; University students

## Introduction

Health is defined as a state of complete physical, mental and social well-being and not merely the absence of disease (1). However, this definition has been subject to controversy (2). Researchers believed that the human health is the ability of individuals or communities to adapt and self-manage in physical, mental or social challenges (3).

However, there are several dimensions of health including social, emotional, spiritual, environmental, occupational, intellectual and physical health (1), but also, almost different dimensions effect on each other. Reserchers believed that the mental and physical health are fundamentally associated with one another. Previous research reported multiple links between mental health and chronic physical conditions. On the other hand, poor mental health is a risk factor for chronic physical conditions, in addition, a chronic physical disability is a main risk factor for developing poor mental health (2).

Measures of general health status provide information on the health of a population. Evaluation of health status is a need to identify the main health problems.

University students are the spiritual resources of each society and the future manufacturers of their own country (4). Therefore, self-rated health status is considered in university students (5). Most behavioral traits are being created and established in student period. Therefore, student period has been considered as an important time (6).

It will know that entering the university created the new expectations for students. There are several factors affecting of university students' health including; not familiar with the university environment, being detached from family, disaffection with the accepted field of study, incompatible with other people in the live environment, inadequate welfare and economic facilities and the corresponding problems (5).

Several studies evaluated the health status in different parts of the worldwide (7-11). Based the results of a study, the ethnicity, study demands and gender are important factors on student psychological health (12). A descriptive-analytical study evaluated the students' mental health among 128 students during the academic year 2010-11 and reported the history of depression and mental disorders in 4.97 % of students before entering the university (5).

Considering that founding and resolving of the psychological, social and educational problems in the students is necessary, therefore, this study is conducted to identify the predictive factors for general health status in Iranian university students in order to provide better health services such as counseling, psychotherapy therapy and drug treatment and develop the students' health level of its consequences.

## Methods

In a Cross – Sectional Study, we assessed 1066 university students in medical and non-medical universities in Ilam in 2014. The samples were selected by a multi-stage sampling method. Data was collected by a two-part questionnaire. The first part of the questionnaire was included personal characteristics such as age, gender, the field and section of the study, parent's job and parents' education. Second part of the questionnaire was GHQ-28.

The GHQ-28 is a screening tool used in epidemiological studies. GHQ-28 has been developed by Goldberg in 1972 (13). The purpose of this questionnaire was to explore psychiatric disorders in different situations. The GHQ-28 has been translated into several languages and used internationally. Validity and reliability of GHQ-28 Test have been confirmed in previous study (14) and Iranian population (15,16).

GHQ-28 is contains 4 scale including; somatic symptoms (items 1–7), anxiety and insomnia (8–14), social dysfunction (15–21) and severe depression (22–28).

There are different scoring methods for GHQ-28. The traditional scoring method provided assigns a score of 0 for responses 1 and 2 (“not at all” and “no more than usual”) and a score of 1 for responses 3 and 4 (“rather more than usual” and “much more than usual”) (17). Another scoring option is a likert method to indicate symptom severity, which scores the item response between 0–3 (0–1–2–3, subscale range) (18).

We used the traditional scoring method and assign a score of 0 for responses 1 and 2 and a score of 1 for responses 3 and 4. Therefore a total score of 28 was considered as the highest score obtained from questions. Also we chose a cut-off point 6, as an Iranian study has confirmed this cut-off point. Participants who receive a score of 6 or less considered as healthy and participants who receive a score of 7 or higher considered as disorders (15).

In the present study, instrument validity obtained using content validity and viewpoints of the panel of experts. The reliability of the questionnaire was determined using Cronbach's alpha coefficient of 87%.

This study was undertaken with the approval of the Ethical Committee of the Ilam University of Medical Sciences. The aim of the study was described, then an informed consent obtained from all participants before the enrollment in the study. To enhance confidentiality, all questionnaires were completed anonymously and only required information was collected.

Results are expressed as Mean  $\pm$  Standard deviation. The Kolmogorov-Smirnov test was used to test the normality in continuing variables. The independent *t*-test was used to compare the mean age in two groups. Chi-square ( $\chi^2$ ) test was used to explore the relationship between gender, parents' education, parents' occupation and the number of children. Both univariate and multiple logistic regression analyses were used to indicate the association between the dependent (healthy vs. disorder) and independent variables. The forward logistic regression method was used to choose the best multivariate logistic regression model in independent variables such as between gender, parents' education, parents' occupation and the

number of children. The predicted probability for health status was computed using the multivariate logistic model. SPSS software package 16 was used to analyze the data of this project.

## Results

A total 1066 university students were studied. Overall, 62.8% students put into the health status. But 37.2% of all participants have disorder in one or more dimensions of their general health status. The Mean  $\pm$  SD age was  $25.36 \pm 6.28$  and  $26.27 \pm 5.752$  years in healthy status students and disorder status students, respectively ( $P = 0.019$ ).

The mean  $\pm$  SD overall score of general health was  $2.9 \pm 2.1$  in healthy status students and  $11.93 \pm 4.15$  in disorder status students. The difference in overall score of general health was statistically significant between healthy and disorder status students ( $P < 0.001$ ).

The univariate logistic regression analysis shows that the variables such as age, gender, father's occupation, parental education and the family size were different between the groups ( $P > 0.05$ ). The association between students' health status and other variables using univariate logistic regression analysis are presented in table 1.

**Table 1.** The association between university students' health status and other variables using univariate logistic regression analysis

Characteristics	B	SE	OR* (95% CI)	P-value
<b>Age</b>	0.024	0.010	1.02 (1-1.04)	0.019
<b>Gender</b>				0.007
Male	-0.352	0.129	0.70 (0.57 - 0.91)	
Female			1.0 (Ref)	
<b>Father's occupation</b>				0.003
Non-governmental	-0.402	0.135	0.67 (0.51-0.87)	
Governmental			1.0 (Ref)	
<b>Mother's occupation</b>				0.997
Non-governmental	20.721	4985.321	0 (0-0)	
Governmental			1.0 (Ref)	
<b>Father's education</b>				0.001
Illiterate	1.647	0.287	5.19 (2.96 -9.11)	
Primary	-0.301	0.213	0.74 (0.49-1.12)	
Secondary	0.405	0.228	1.5 (0.96-2.34)	
Diploma	0.791	0.179	2.20(1.55-3.13)	
Academic			1.0 (Ref)	
<b>Mother's education</b>				0.001
Illiterate	-21.236	12712.471	0.000	
Primary	-21.623	12712.471	0.000	
Secondary	-21.851	12712.471	0.000	
Diploma	-21.636	12712.471	0.000	
Academic			1.0 (Ref)	
<b>The family size</b>	-0.183	0.042	0.83 (0.77-0.90)	0.001

\*CI: Confidence Interval

By the multivariate logistic regression analysis, age, gender, father's occupation and the family size were considered as independent predictive variables for university students' health status. The association between university students' health status and other

variables using multivariate logistic regression analysis are presented in table 2.

The overall percentage of correct classification of the model is 65.7%. It means that, with knowing the age, gender, father's occupation and the family size the

ability of the model to predict the actual category of the cases is 65.7%.

**Table 2.** The association between university students' health status and other variables using multivariate logistic regression analysis

Characteristics	B	S.E.	Wald	OR* (95% CI)	P-value
Age	0.044	0.014	9.727	1.04 (1.02-1.07)	0.002
Gender	0.349	0.171	4.182	1.42(1.01-1.99)	0.041
Father's occupation	-0.300	0.148	4.098	0.741(0.55-0.99)	0.043
Family size	-.117	0.044	6.885	0.890 (0.82-0.97)	0.009

\*CI: Confidence Interval

## Discussion

In the present study investigated the predictive factors for general health status in Iranian university students in 2014 in Ilam, Western of Iran. About one third of all participants (37.2%) have disorder in one or more dimensions of their general health status.

The univariate logistic regression analysis showed the variables such as age, gender, father occupation, parental education, and family size as the main predictive factors of general health status in our population. The effect of age on different aspects of health has been studied widely (19-22). In confirm our results, other studies reported the relationship between age and psychosomatic complaints (23, 24). Based our results, the prevalence of health disorder was higher in female university student in comparison to male university students. A study reported that females are significantly more sedentary than males (11).

The results of the present study showed parental education as a main factor in university students' health status. The risk of health disorders was 5 times in student with illiterate father in comparison to healthy students. Currie and Moretti (2003) reported a significant improvement of health status in children of women attending College (25). In recent years, researchers has focused on the link between parental education and their children's health. Most people with higher education levels have better positions and more income in Iran. While a socioeconomic status (SES) is related with health when health care costs are increasing (26). On the other hand, increasing parental education levels lead to an improvement of dietary behaviours (27).

Family performance is higher in parents with high education level. There is a significant relationship between family function and general health of children. Family function and parents general health can be effective for the childhood depression and anxiety (24).

With the multivariate logistic regression analysis age, gender, father's occupation and the family size were considered as independent predictive variables for university students' health status. Based on the results the father's occupation was another predictive factor in university students' general health. So that students who their father has governmental occupation, the risk of health disorder increased higher in comparison who their father has non-governmental occupation. Today, researchers confirmed the causal impact of parental occupation or parental income on later outcome of their children (25). Another study confirmed the effect of family factors on the health status (13).

In view of the above findings, there are several risk factors for university students' general health disorder. The age, gender, father's occupation and the family size are main predictive factors for general health status in university students.

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## Conflict of Interest

The authors declare that they have no conflict of interests.

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