



Mean Scores of Depression, Anxiety and Stress in Iranian University Students Based on DASS-21: A Systematic Review and Meta-analysis

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Abstract

Background and aims: Depression is the most common psychiatric disorder, and students are more predisposed to depression than other populations. This meta-analysis was conducted to estimate the mean depression score in Iranian students based on DASS-21.

Methods: The search was carried out using keywords Depression, Student, DASS-21 and Iran in domestic databases, including SID, Medlib, IranMedex, Irandoc, and Magiran. Data were analyzed using a meta-analysis (random effects model). The heterogeneity of studies was studied using the I² index. Data were analyzed using the Stata software version 11. DASS-21 had been used in all reviewed studies.

Results: The sample size was 3229 people included in 17 studies. The mean depression score in Iranian students based on DASS-21 was 9.30 (95% CI: 12.57-6.03), 8.90 in female students (95% CI: 4.50-13.29) and 8.45 in male students (95% CI: 4.03-12.86). The mean scores of anxiety and stress in students were 8.58 (95% CI: 5.95-12.86) and 9.91 (95% CI: 11.28-8.54), respectively.

Conclusion: The mean depression score is higher in female students than in male students, and the mean score of stress is slightly higher than those of anxiety and depression.

Keywords: Depression, Anxiety, Stress, Student University, DASS-21, Iran

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Received: 26 June 2018
Accepted: 5 January 2019
ePublished: 24 January 2019



Introduction

Depression, anxiety and stress of modern life cause severe damage to human's body and spirit and lead to physical illnesses.¹ Various studies indicate the high incidence of these disorders among students.² About 30% of students experience some degree of depression when they enter university.³

Students are susceptible to mental illnesses due to special circumstances of studying at the university, including being away from the family, entering a large and stressful complex, having economic problems and insufficient income, taking large volumes of courses, and participating in strenuous academic competitions.^{4,5} Studies have also shown that students all over the world are predisposed to depression,⁶ with the prevalence which seems to be rising.⁷

The incidence rate of mental disorders in Iran is not much different from global figures, and depression and anxiety are the most important psychological disorders in Iran.⁸ Since students make up a significant proportion

of the population of Iran that is also on rise on an annual basis, the importance of students' health becomes more and more evident.⁹

Depression may lead to low self-esteem, addiction, disturbance in academic, occupational, familial, and social functions of the individual as well as stupendous costs on society.^{6,7} In addition, high exposure to stress may have negative effects on clinical education and students' health and cause physical and psychological problems.¹⁰ If anxiety is severe or delayed, it is harmful and plays an important role in the onset of psychosomatic diseases and mental disorders such as depression.¹¹

Unmodifiable risk factors and demographic characteristics, such as age, gender,¹² and race¹³ can contribute to the development of such disorders. Inflammation, smoking, strenuous physical activity, inappropriate nutrition and alcohol consumption are some risk factors that can be modified.¹⁴

According to the above-cited studies, the prevalence rates of depression, stress and anxiety are varied in

different countries. A study was conducted on students at the Aga Khan University in Pakistan and showed that 39% of them suffered from depression.¹⁵ Moreover, the prevalence rates of depression among students in the Medical School and Pharmacy School in Alexandria, Egypt, were 57.9% and 51.1%, respectively.¹⁶ The results of a research by Eisenberg et al. on students in Michigan State University, the United States, indicated that 15% of students experienced some degree of depression.¹⁷

Kim reported that 30% and 48% of Korean students experience anxiety and depression in their everyday lives, respectively.¹⁸ Martin reported that 67.9% of nursing students in Scotland experienced stress.¹⁹ A study in the United States showed that approximately 15% of students experience anxiety every year.²⁰ In a study in Malaysian students, 42% of them were found to have anxiety.²¹

The prevalence rate of depression in American students was 65%, and in female students of Kentucky universities 35%. It was reported to range from 1.6% to 22% in Iran from 1975 to 1992.²² In a study conducted in students in Denizli, Turkey, the prevalence rate of depression among students was 26.6%.²³ Considering that adverse effects of depression, such as academic failure, are among of the most important educational problems in developing countries and Iran,²⁴ that there are no accurate and comprehensive statistics on the incidence rate of depression in Iranian students based on the DASS-21 scale (The Depression Anxiety Stress Scales—21), and that various studies have reported various mean scores for depression among Iranian students, this review was conducted to provide a precise estimate of the mean scores of depression, anxiety, and stress in Iranian students using the DASS-21.

Methods

Search Strategy

The present study is a meta-analysis that investigates the status of depression, anxiety, stress in Iranian students by using the DASS-21. It was carried out using keywords depression, student, DASS-21 and Iran in domestic databases, including SID, Medlib, IranMedex, Irandoc, and Magiran. Since these databases are not sensitive to search operators (i.e., OR, AND, NOT), they were not used.

The DASS-21: This scale was developed by Lovibond and Lovibond, which is a set of three self-report scales to assess the adverse emotional states of anxiety, depression and stress. Each of the subscales includes 7 items.²⁵ The scale consists of 21 questions, which are scored from 0 to 3 (*Never, To some extent, medium and high*). Score 0 represents the lowest level of the problem in question and score 3 represents the highest level of the problem; higher scores represent the higher severity of the disease. Minimum and maximum possible attainable scores on the scale are 21 and 83, respectively.²⁶

Selection of Articles

First, a list of titles and abstracts of all the articles searched in the studied databases was prepared. This was done independently by two researchers. Then, the articles with duplicate titles were removed. Subsequently, the abstracts of articles were reviewed to include eligible studies. Inclusion criterion was studying depression status in Iranian students based on the DASS-21. Exclusion criteria were unrelated design and research subject, lack of providing sufficient information, and low-quality of the research work. The STROBE checklist²⁷ was used to select the articles.

This checklist includes 22 sections that cover different parts of an article. Each section was assigned one point, and some more important sections were assigned higher points.

Data Extraction

To reduce reporting bias and error in data collection, two researchers independently performed data extraction from articles using a standard, pre-prepared data collection form. This form was initially designed by the research team and included the following items: name(s) of the author(s), title, year of publication, city of study, mean (\pm standard deviation) depression, anxiety, and stress scores, total number of samples, and the number of male and female students.

Statistical Analysis

Considering the fact that the mean scores of depression, anxiety, stress and their subgroups were low, the mean (\pm standard deviation) values of these indices were drawn from each study, with their the variances calculated using normal distribution. The results of the studies were combined using the random effects model (constant), considering the sample size, mean and standard deviation of each study. To investigate the heterogeneity of the studies, I^2 index was used. All statistical analyses were performed by the Stata software version 11 using Metan commands. Meta-regression was used to investigate the relationship between the mean depression score of Iranian students according to the DASS-21 and the sample size and years of study.

Meta-regression was also used to investigate the relationship between depression in students and the sample size and year(s) of conducting study. Egger test was used to investigate the statistical significance of the publication bias.

Results

The total number of participants included in 17 reviewed studies is 3229. The specifications of the reviewed articles are listed in Table 1 and the stages of the selection of the studies for the meta-analysis process are presented in Figure 1.

Table 1. Characteristics of Reviewed Articles

First Author	Year	City of Study	Age Mean	Sample Size	Depression		Anxiety		Stress	
					Mean	SD	Mean	SD	Mean	SD
Mohammedian ²⁸	2008	Tehran	-	29	19.71	9.71	-	-	-	-
Rahiminejad ²⁹	2010	Tehran	-	150	4.04	3.52	5.89	4.87	5.28	7.51
Zare ³⁰	2012	Kermanshah	-	235	6.32	4.76	5.92	3.11	9.05	3.069
Rezaei Aderyani ²	2005	Tehran	-	223	5.43	4.5	4.41	4	7.94	4.84
Vafaie ³¹	2010	Tehran	-	300	7.3	5.01	5.93	3.78	10.19	4.21
Prov ³²	2011	Tehran	-	46	6.28	4.865	-	-	-	-
Safari ³³	2013	Kermanshah	-	356	1.76	0.48	-	-	-	-
Najafi Kalyani ³⁴	2009	Fasa	-	179	5.89	4.28	5.56	4.23	6.59	5.09
Kheirabadi ³⁵	2012-13	Esfahan	-	68	8.71	8.41	6.88	6.03	13.29	8.24
Saberipour ³⁶	2015	Shooshtar	21.102 (2.24)	215	13.46	9.81	8.18	6.65	13.64	9.12
Alizadehesar ³⁷	2013-14	Kerman	21.97 (3.95)	407	6.62	5.05	5.46	4.4	8.03	4.85
Nasirzadeh ³⁸	2005-06	Shiraz	-	251	15.69	6.18	20.96	5.58	-	-
Heidari ³⁹	2012	Babol	-	20	12.6	1.85	13.7	2.69	-	-
Hasani ⁴⁰	2013-14	Tehran	23.14 (3.41)	22	3.63	3.4	11.68	3.56	16.59	4
Shokri ⁴¹	2014	Tehran	-	60	5.07	3.9	-	-	-	-
Hemmati Sabet ⁴²	2015-16	Hamedan	-	30	23.2	1.53	-	-	-	-
Samani ⁴³	2007	Shiraz	21.9 (3.6)	638	13	-	-	-	-	-

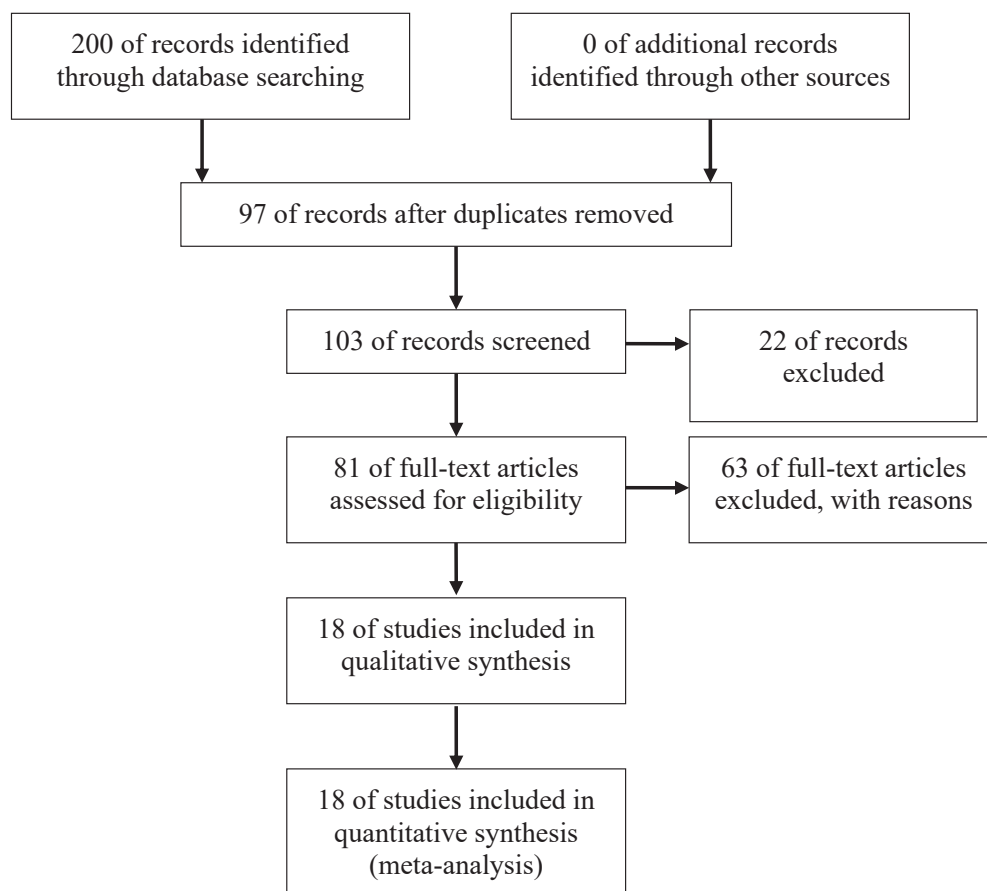


Figure 1. Flowchart of Studies Selected for the Systematic Review and Meta-Analysis.

Table 2. The Results of Meta-analysis on Depression in Iranian Students Based on DASS-21

Subgroups	Number of Study	Mean	Lower Limit	Upper Limit	P Value	I ² (%)
Depression in total	17	9.30	6.03	12.57	0.001	99.9
Depression in girls	7	8.90	4.50	13.29	0.001	99.7
Depression in boys	7	8.45	4.03	12.86	0.001	99.9
Anxiety	11	8.58	5.95	11.22	0.001	99.5
Stress	9	9.91	8.54	11.28	0.001	97.2

The mean depression score in Iranian students based on DASS-21 was 9.30 (95% CI: 12.57-6.03); It was 8.90 in female students (95% CI: 4.50-13.29) and 8.45 in male students (95% CI: 4.03-12.86). The mean depression score in students for the studied subgroups is presented in Table 2.

Figure 2 illustrates the mean score of Iranian students using DASS-21. As the figure shows, the means ranged 1.76 to 23.20. According to the reported studies the overall mean score is 9.30.

According to Figure 3, there is no significant relationship between the mean depression score of Iranian students based on the DASS-21 and the number of study samples ($P=0.590$). As Figure 4 illustrates, there is also no significant relationship between the mean depression score of Iranian students based on the DASS-21 and the year of publication ($P=0.827$).

Discussion

The sample size was 3229 people in 17 studies. The mean depression score in Iranian University students was 9.30;

It was 8.90 in female students and 8.45 in male ones. The mean scores of anxiety in students were 8.58 and 9.91, respectively. The mean depression score in female students is higher than that in male ones. In his study on Japanese students, Watanabe reported the levels of depression to be higher among female students,⁴⁴ which is consistent with our study. In the study of Safari et al, anxiety, stress and depression levels in male students were higher than those in female ones. Similar results were also obtained by Rezaei Aderyani et al.² Grant and Watanabe, in their study, reported stress, anxiety and depression levels in female students to be higher than those in male ones.^{44,45}

In Figure 3, the sizes of the circles show the magnitude of the sample size. There is no significant relationship between the mean depression score in Iranian students and the sample size ($P=0.590$). With increasing the sample size, the mean depression score in Iranian students decreased based on the DASS-21, but it was not statistically significant. In Figure 4, the meta-analysis showed that there was no significant relationship between

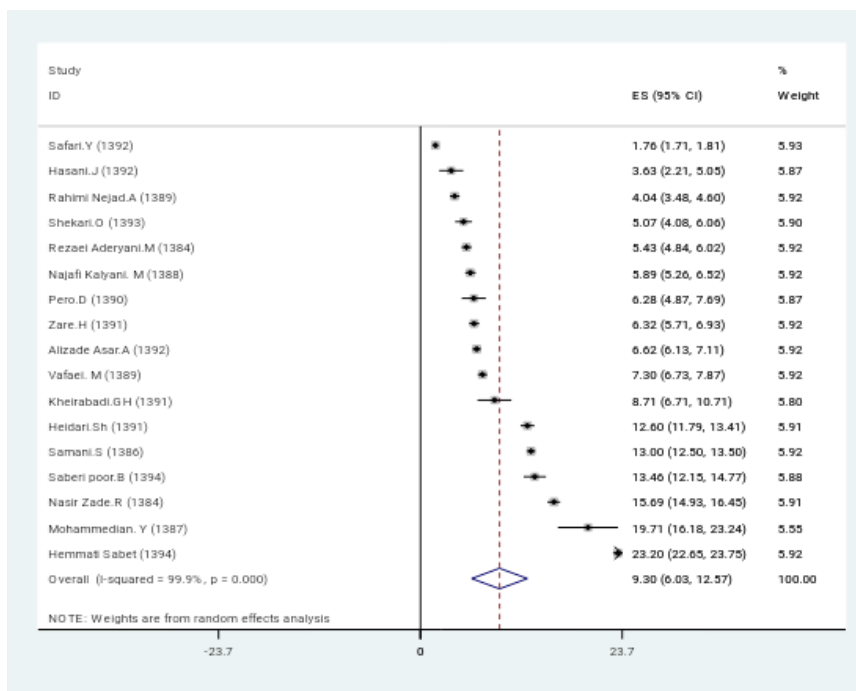


Figure 2. The Mean Depression Score in Iranian Students Using DASS-21 With 95% CI Based on the Authors' Name and Year of Publication, According to Random Effects Model. The middle point of each section reveals the average score of depression obtained in each study, and the lozenge shape shows the mean depression score in Iranian students for all studies.

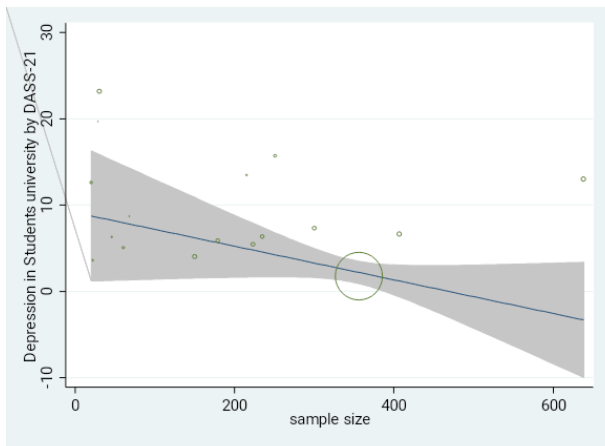


Figure 3. Relationship Between Mean Depression Score in Iranian Students Based on DASS-21 and the Number of Study Samples Using Meta-regression.

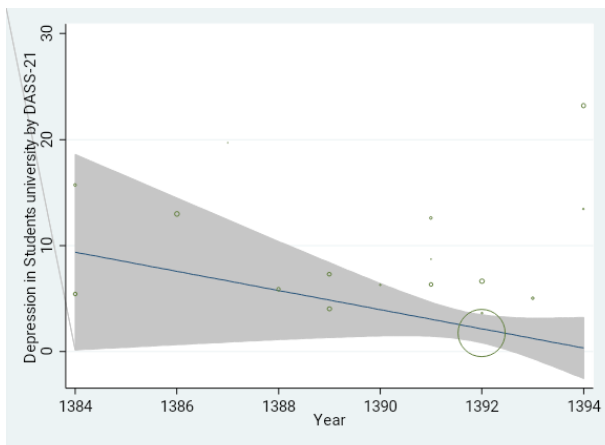


Figure 4. Relationship Between Mean Depression Scores in Iranian Students Based on the DASS-21 and Year of Publication Using Meta-regression.

mean depression score in Iranian students based on DASS-21 and year of publication ($P=0.827$). During the studied years, the mean depression score in Iranian students, calculated by the DASS-21, did not decrease significantly.

The mean scores of anxiety and stress in Iranian students according to the DASS-21 were 8.58 and 9.91, respectively. In 2013, Shamsudin et al in Malaysia evaluated 506 students (226 boys and 280 girls) and reported the average scores of the students to be 11.04 ± 7.48 for depression, 11.77 ± 6.99 for anxiety and 13.85 ± 7.27 for stress according to the DASS-21. The mean scores of depression, anxiety and stress were higher in girls than those in boys,⁴⁶ which is consistent with our study results.

In the study of Day et al in Canada (2010), 66 students (7 boys and 59 girls) were examined by the DASS-21, where the results showed the mean scores of depression, anxiety and stress were 19.97 ± 10.69 , 13.76 ± 7.97 and 21.82 ± 7.76 , respectively.⁴⁷ In a study in Spain by Bados et al on 365 students (68 boys and 297 girls) aged

20-25 years, the mean scores of depression and anxiety were 16.50 ± 8.66 and 13.57 ± 8.65 , respectively.⁴⁸ In the above studies, the levels of depression, anxiety and stress were reported to be higher in Malaysian, Canadian and Spanish students than those in Iranian ones. In a study by Kulsoom et al in Saudi Arabia, 575 students were evaluated with the DASS-21, and their mean depression, stress and anxiety scores were obtained 6.65 ± 5.39 , 8.79 ± 5.20 and 6.87 ± 4.69 , respectively.⁴⁹ In the United Kingdom, Van Gordon et al conducted a study using the DASS-21 and reported a mean score of 8.18 ± 6.62 for depression among 11 students.⁵⁰ Furthermore, Lovell et al in Australia evaluated 751 students using the DASS-21 and reported a mean score of 4.75 ± 5.03 for depression, 3.95 ± 3.81 for anxiety, and 7.01 ± 4.61 for stress.⁵¹ According to these studies, the levels of depression, anxiety and stress were lower in Saudi, British and Australian students than those in Iranian ones.

Conclusion

The mean scores of depression, anxiety and stress among Iranian students, according to the DASS-21, were higher than those reported from other countries. In addition, the severity of depression was higher in female students than that in male ones. According to these results, measures should be taken to control depression, anxiety and stress in Iranian students to reduce their negative impacts.

Based on the meta-regression model, the severity of depression in Iranian students, according to the DASS-21, has not decreased in recent years, which is a serious alarm for the authorities and researchers to consider more than ever.

It is also suggested that the mean scores of depression, anxiety and stress of Iranian students be evaluated using other instruments so that the results obtained using various questionnaires can be compared and more detailed results can be provided.

Ethical Approval

The study protocol was approved by the committee of Ilam university of medical sciences.

Conflict of Interest Disclosures

None.

Funding/Support

None.

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How to cite the article: Mohammadzadeh J, Mami S, Omidi K. Mean scores of depression, anxiety and stress in Iranian university students based on DASS-21: a systematic review and meta-analysis. *Int J Epidemiol Res*. 2019;6(1):42-48. doi: 10.15171/ijer.2019.08.