Prevalence of Depression among University Students: A Systematic Review and Meta-Analysis Study

Diana Sarokhani,1,2 Ali Delpisheh,3,4 Yousef Veisani,1,4 Mohamad Taher Sarokhani,1,5 Rohollah Esmaeli Manesh,6 and Kourosh Sayehmiri4,7

1 Student Research Committee, Ilam University of Medical Science, P.O. Box 69311-57793, Ilam, Iran
2 Department of Computer, Faculty of Engineering, Malayer University, P.O. Box 95863-65719, Hamadan, Iran
3 Department of Clinical Epidemiology, Ilam University of Medical Sciences, P.O. Box 69315-138, Ilam, Iran
4 Psychosocial Injuries Research Center, Ilam University of Medical Science, P.O. Box 69315-138, Ilam, Iran
5 Science and Research Branch, Islamic Azad University, Kermanshah, Iran
6 Eslamabad Payame Noor University, Kermanshah, Iran
7 Social Medicine Department, Medicine Faculty, Ilam University of Medical Sciences, P.O. Box 69315-138, Ilam, Iran

Correspondence should be addressed to Mohamad Taher Sarokhani; m_taher_sarokhani@yahoo.com

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Introduction. Depression is one of the four major diseases in the world and is the most common cause of disability from diseases. The aim of this study is to estimate the prevalence of depression among Iranian university students using meta-analysis method.

Materials and Methods. Keyword depression was searched in electronic databases such as PubMed, Scopus, MAGIran, Medlib, and SID. Data was analyzed using meta-analysis (random-effects model). Heterogeneity of studies was assessed using the $I^2$ index. Data was analyzed using STATA software Ver.10. Results. In 35 studies conducted in Iran from 1995 to 2012 with sample size of 9743, prevalence of depression in the university students was estimated to be 33% (95% CI: 32–34). The prevalence of depression among boys was estimated to be 28% (95% CI: 26–30), among girls 23% (95% CI: 22–24), single students 39% (95% CI: 37–41), and married students 20% (95% CI: 17–24). Metaregression model showed that the trend of depression among Iranian students was flat.

Conclusions. On the whole, depression is common in university students with no preponderance between males and females and in single students is higher than married ones.

1. Introduction

Depression among university students is extremely prevalent and widespread problem across the country [1–3]. University students are a special group of people that are enduring a critical transitory period in which they are going from adolescence to adulthood and can be one of the most stressful times in a person’s life. Trying to fit in, maintain good grades, plan for the future, and be away from home often causes anxiety for a lot of students [4]. As a reaction to this stress, some students get depressed. They find that they cannot get themselves together. They may cry all of the time, skip classes, or isolate themselves without realizing they are depressed. Previous studies reported that depression in university students is noted around the world [5–7] and the prevalence seems to be increasing [8].

The average age of onset is also on the decline, making depression a particularly salient problem area for university student populations [8]. Over two-thirds of young people do not talk about or seek help for mental health problems [9].

In Iran, preliminary studies on emotional distress have emerged in recent years including depression in Iranian university. Within the abovementioned background, the aim of this study is to estimate the prevalence of depression among university students using meta-analysis method.
2. Methods and Materials

2.1. Literature Search. Our search strategy, selection of publications, and the reporting of results for the review will be conducted in accordance with the PRISMA guidelines [10]. Literatures on the depression among student were acquired through searching Scientific Information Databases (SID), Global Medical Article Limberly (Medlib), Iranian Biomedical Journal (Iran Medex), Iranian Journal Database (Magiran), and international databases including PubMed/Medline, Scopus and ISI Web of Knowledge. The search strategy was limited to the Persian and/or English language and articles published up until February 2012 were considered. All publications with medical subject headings (MeSh) and keywords in title, abstract, and text for words including student depression were investigated. Iranian scientific databases were searched only using the keyword “student depression,” as these databases do not distinguish synonyms from each other and do not allow sensitive search operation using linking terms such as “AND,” “OR” or “NOT.” Consequently, this single keyword search was the most practical option.

2.2. Selection and Quality Assessment of Articles. All identified papers were critically appraised independently by two reviewers. Disagreements between reviewers were resolved by consensus. Appraisal was guided by a checklist assessing clarity of aims and research questions. The inclusion criteria were as follows: (1) studies in the mentioned databases with full text, despite the language of original text; (2) having a standardized assessment of depression (either self-report or observer-rated). Exclusion criteria were (1) studies upon student overlapping time intervals of sample collection from the same origin; (2) low-quality design (STROBE checklist score’s below 7.75 [11]); (3) inadequate reporting of results.

2.3. Data Extraction. Data were extracted using a standardized and prepiloted data extraction form. Data extraction will be undertaken by the first reviewer, and checked by a second reviewer although the process will be discussed and piloted by both reviewers. All identified papers will be critically appraised independently by both reviewers. Disagreements were resolved through discussion. Appraisal will be guided by a checklist assessing clarity of aims and research questions. Information was extracted from each included study (including author, title, year and setting of study, methods of sample selection, sample size, study type, age, STROBE score, and prevalence). These data abstraction forms were reviewed and eligible papers were entered into the meta-analysis.

2.4. Statistical Analysis. The random effects model was used for combining results of studies in meta-analysis. Variance for each study was calculated using the binomial distribution formula. The presence of heterogeneity was determined by the DerSimonian-Laird (DL) approach [12]. Significance level was <0.1 and $I^2$ statistic for estimates of inconsistency between studies. The $I^2$ statistic estimates the percent of observed between-study variability due to heterogeneity rather than to chance and ranges from 0 to 100 percent (values of 25%, 50% and 75% were considered representing low, medium and high heterogeneity, resp.). A value of 0% indicates no observed heterogeneity whilst 100% indicates significant heterogeneity. For this review, we determined that $I^2$ values above 75 percent were indicative of significant heterogeneity warranting analysis with a random effects model as opposed to the fixed effects model to adjust for the observed variability [13]. This heterogeneity was further explored through subgroup analyses and metaregression. Univariate and multivariate approach were employed to assess the causes of heterogeneity among the selected studies. Egger test was conducted to examine potential publication bias. Data manipulation and statistical analyses were done using STATA software, version 10. $P$ values < 0.05 were considered as statistically significant.

3. Results

According to the literature search strategies, 65 studies were identified, but 30 studies were excluded as they did not meet the inclusion criteria. Finally, 35 studies were published between 1995 and 2012 and included in meta-analysis (Table 1 and Figure 1).
Table 1: Feature and characteristic studies included in study.

| Study number/author(s)/no. of reference | Place              | Publication year | No. of population | Prevalence (%) | Instrument assessment | Cut point |
|----------------------------------------|--------------------|------------------|-------------------|----------------|-----------------------|-----------|
| (1) Bahrami Dashtaki [14]              | Tehran             | 2005             | 100               | —              | BDI                   | 15        |
| (2) Mohammadian [15]                  | Tehran             | 2010             | 302               | —              | BDI                   | 16        |
| (3) Alavi [16]                        | Mashhad            | 2011             | 20                | —              | BDI                   | 16        |
| (4) Hosseini [17]                     | Kermanshah         | 2002             | 162               | 23.5           | BDI                   | 15        |
| (5) Bahadori Khosroshahi [18]         | Zahedan            | 2010             | 200               | —              | BDI                   | 16        |
| (6) Biani [19]                        | Tabriz             | 2008             | 571               | —              | BDI                   | 16        |
| (7) Mohammad-Bigi et al. [20]         | Arak               | 2009             | 304               | 52.3           | BDI                   | 15        |
| (8) Amani et al. [21]                 | Ardabil            | 2004             | 324               | 54.7           | BDI                   | 16        |
| (9) Dadkhah [22]                      | Ardabil            | 2009             | 409               | 50.8           | BDI                   | 16        |
| (10) Pahlavan-Zadeh et al. [23]       | Isfahan            | 2010             | 50                | 38             | GHQ 28                | 22        |
| (11) Ranjbar-Kohan and Sajjadi Nejad [24] | Isfahan           | 2010             | 40                | —              | BDI                   | 16        |
| (12) Makvandi et al. [25]             | Ahvaz              | 2012             | 185               | —              | BDI                   | 17        |
| (13) Makvandi [26]                    | Ahvaz              | 2010             | 215               | —              | BDI                   | 16        |
| (14) Ahmadi [27]                      | Ahvaz              | 1995             | 200               | 45             | BDI                   | 16        |
| (15) Hasan Zadeh Taheri et al. [28]   | Birjand            | 2011             | 231               | 12.1           | BDI                   | 14        |
| (16) Moghareb et al. [29]             | Birjand            | 2009             | 400               | 45             | BDI                   | 16        |
| (17) Frohani [3]                      | Lar                | 2005             | 134               | 42.5           | BDI                   | 16        |
| (18) Najafipour and Yektatalab [30]   | Jahrom             | 2008             | 150               | 45.4           | BDI                   | 15        |
| (19) Ildar Abadi et al. [1]          | Zabol              | 2002             | 175               | 64.3           | BDI                   | 16        |
| (20) Ahmadi-Tehrani et al. [31]      | Qom                | 2009             | 250               | 62.8           | BDI                   | 16        |
| (21) Partoi-Nejad [32]                | Qom                | 2011             | 600               | 33.3           | GHQ 28                | 22        |
| (22) Karami [33]                      | Kashan             | 2009             | 208               | 48             | GHQ 28                | 22        |
| (23) Sooky et al. [34]                | Kashan             | 2010             | 307               | 35.8           | BDI                   | 16        |
| (24) Reina et al. [35]                | Kordestan          | 2010             | 400               | 37.5           | BDI                   | 17        |
| (25) Eslami et al. [36]               | Gorgan             | 2001             | 202               | 15.5           | BDI                   | 16        |
| (26) Abdollahi et al. [37]            | Golestan           | 2011             | 132               | —              | BDI                   | 16        |
| (27) Tavakoli et al. [38]             | Gonabad            | 2001             | 291               | 13.4           | BDI                   | 15        |
| (28) Ghashemi et al. [39]             | Mashhad            | 2009             | 780               | 28.6           | BDI                   | 15        |
| (29) Mohtashami-Poor et al. [40]      | Mashhad            | 2001             | 264               | 45.3           | BDI                   | 16        |
| (30) Abedini et al. [2]               | Bandaradas         | 2007             | 190               | 30.2           | BDI                   | 16        |
| (31) Hashemi et al. [41]              | Yasuj              | 2003             | 421               | 69.2           | BDI                   | 16        |
| (32) Hashemi et al. [42]              | Hormozgan          | 2004             | 452               | 62             | BDI                   | 14        |
| (33) Hashemi and Kamkar [43]          | Yasuj              | 2001             | 464               | 35.6           | BDI                   | 17        |
| (34) Baghian Moghadam and Ehrampoosh [44] | Yazd             | 2006             | 125               | 42.4           | BDI                   | 16        |
| (35) Baghian Moghadam et al. [45]     | Yazd               | 2011             | 185               | 30             | BDI                   | 15        |

The overall prevalence of depression among university students was 33% (CI 95%: 32–34) (Figure 2). Prevalence of depression among subgroup including male and female students and single and married students was 28% (CI 95%: 26–30), 23% (CI 95%: 22–24), 39% (CI 95%: 37–41), and 20% (CI 95%: 17–24) respectively (Figure 3).

The meta regression of the prevalence of student depression again sample size of studies showed no statistically significant relationship ($P = 0.66$) (Figure 4). Scatter plot year of study and the prevalence of student depression meta regression showed a negative and no statistically significant relationship ($P = 0.70$). Since 1995, the student depression showed a stable trend (Figure 5).

4. Discussion

In this systematic review, we have fully described our search strategy, study selection, data summary, and analysis to allow sensitivity analysis of any aspect of our approach. We have included every study that to our knowledge satisfies our inclusion criteria and employed techniques of estimation that allow integration of studies with high heterogeneity. In situations with high between-study heterogeneity (93.3%), the use of random-effects models is recommended as it produces study weights that primarily reflect the between-study variation and thus provides close-to-equal weighting [13].
In the current study, the Beck depression inventory (BDI) has been utilized to detect the prevalence of depression among university students. Although it is not designed for diagnostic purposes, its epidemiologic utility has been evaluated in several studies, which concluded that it is a reliable and valid instrument for detecting depressive disorders in nonclinical populations. Several studies support the BDI’s usefulness in measuring and predicting depression in university students in Iran.

The study showed that the prevalence of depression among university student was 33% (CI 95%: 32–34). Steptoe et al. showed that Asian countries had the highest level depressive symptoms [48], which was consistent with our result. The incidence of depression in our study was higher than in other studies, and as Bayram and Bilgel reported that depression were found in 27.1% of Turkish university students [49], Bostanci reported that out of all university students in Denizli, 26.2% had a BDI score of 17 or higher [50]. This variation has been explained to be due to cultural differences, different measurement tools, different methods, and different appraisal standards. University is an important transient life stage, with special academic, financial, and interpersonal pressures. Undergoing these transitions may lead to an increased risk of depression. However, the prevalence of depressive symptoms in the present study is a high incidence rate, more than that seen in average people. Most students who join university in Iran are leaving their homes for the first time. This might subject them to loss of the traditional social support and supervision, in addition to residing with other students and peer relationships. Moreover, there is a change in the style of learning from what the students are used to in school. These changes may act as risk factors to depression in university students in Iran.

We found no differences in depression between genders in our study. Similar to our results, some previous studies [49–51] showed that no differences in depression were observed among male and female students. This might originate from the fact that Iranian female university students have equal experience of the same pressure. However, some studies findings are contrary to our results and found higher levels of depression among female students [50–52].

We found that single students were susceptible to depression compared with married students. This may be because the single students face more stressful events than the married students, such as employment, economic, graduation, and marriage pressures. Contrary to our study, some studies showed that married students reported higher levels of depression [49].

One of the limitations of this study is that the difference in assessment tools and researchers varies in their choice of cut point according to the study location. Secondly, the more studies were observational and patients were not randomly chosen in addition our ability to assess study quality was limited by the fact that many studies failed to offer detailed information on selected subjects or valid data on important factors. Therefore selection bias and confounding...
5. Conclusion

In summary, we found that depression is common in university students with no preponderance between males and females and in single students is higher than married ones. Our findings point to importance of screening of this vulnerable population and taking appropriate interventional measures to prevent the complications of depression. Further research studying sociodemographic factors and the effect of depression on the academic performance is needed.

Conflict of Interests

The authors declare no conflict of interests.
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