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

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ABSTRACT

Background: Depression is one of the most commonly occurring mental disorders globally and it is increasingly prevalent among university students. This systematic review and meta-analysis estimate the pooled prevalence of depression among university students in Ethiopia.

Method: The studies were identified from data base of PubMed, Google Scholar and reference lists of previous studies. All cross-sectional studies reporting the prevalence of depression among university students in Ethiopia was included. In order to transform the prevalence of extracted studies we have used Freeman-Tukey transformation (arcsine square root transformation and the pooled proportion was calculated using the back transformation of the weighted mean of the transformed proportions, using inverse arcsine variance weights for the fixed effects model and DerSimonian-Laird weights for the random effects model. The Cochrane Q test and I2 test statistic was used to test heterogeneity across studies. Meta regression was performed to explore source of heterogeneity between studies and evidence of publication bias was also be assessed.

Results: The analysis of thirteen studies, according to the Der Simonian-Laird random effects model, revealed that the pooled prevalence of depression among the Ethiopian university students was 34.0% (95% CI: 28.7%, 39.6%). The included articles exhibited high heterogeneity, that is I^2=94.58% and heterogeneity *chi-square*=221.46 (df=12) p-value<0.001. Accordingly, it is indicative to use random effect model. But the Egger weighted regression statistics (p=0.31) and Begg rank correlation statistics (p=0.18) indicated no evidence of publication bias.

Conclusion: In light of the results of the present review, future research on the prevalence of depression and associated factors among higher education students should be conducted.

Keywords: Prevalence; Depression; University students; Ethiopia

Abbreviations: 95% CI: 95% Confidence Interval; MeSH: Medical Subject Headings; PRISMA-P: Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols; WHO: World Health Organization

INTRODUCTION

Depression is one of the most commonly occurring mental disorders globally. For certain depressed mood or loss of pressure or interest to be diagnosed as depression, the duration matters and has to be manifested for a long period of time. Mere changes of mood and feelings in everyday life cannot be considered as depression. It also affects a wide range of a person's life which includes malfunctioned relationships with family, friends and the community at large. The resultant problems can also be extended to affecting one's activities at school and at work place among other things. Anyone can be

affected by depression in one way or the other. The factors that lead to depression, including abuse, severe losses or other stressful situations in one's life can play an important role in developing depression. With 50% more commonality, women are more prone to depression than men [1].

With the difficult transition from childhood to adulthood, university students are more vulnerable groups as they are going through this important stage of their life. This particular stage of transition found to be the most stressful time in a students' life. Among the factors that many students going through, including anxiety as they are trying to fit in, getting good grades, uncertainty of the future and being homesick make them more prone to the condition [2].

The results of numerous literature reviews and meta-analyses conducted around the world showed that university students frequently experience depression. The prevalence of depression among university students was determined to be 33% in a comprehensive review and meta-analysis of 35 published studies that involved 9743 study participants which carried out in Iran between 1995 and 2012. In another meta-analysis and comprehensive study involving 27 cross-sectional studies revealed that the prevalence of depression among nursing students was found to be 34%.

In a meta-analysis and systematic review on depression among university students in low and middle-income countries, involving 76,608 participants in 20 countries, the prevalence of depression was found to be about 24.4%.

With regard to predisposing factors, several studies have been conducted to explore the causes and resulting negative effects of depression among university students. The findings revealed that there are a wide variety of factors other than academic stressors, including the role of different bio-psychological stressors.

Living away from family, uncertainty about future employment, financial challenges, psychological factors such as poor resilience, academic related pressure, a competitive environment and interpersonal relationships have all been found to be predisposing factors for depression to be prevalent among university students. These are just some of the many factors that make university students vulnerable to depression. With regard to adverse consequences resulting from depression, early on-set of depression was found to be related with a variety of outcomes, such as academic dismissal, poor academic performance, severe role impairment and prospect of unemployment during adulthood [3].

As far as systematic reviews and meta-analyses examining the prevalence of depression among university students in Ethiopia concerned, no such studies have been conducted and published in the country. As such, in light of this important research gap, the objective of this particular systemic review and meta-analysis was to estimate the pooled prevalence of depression among university students in Ethiopia [4].

Data extraction/abstraction

MATERIALS AND METHODS

The report of this systemic review and meta-analysis protocol was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P). The review protocol has been registered in the International Prospective Register of Systematic Reviews (PROSPERO) [5].

Study design

Systematic review and meta-analysis was conducted to estimate the pooled prevalence of depression among university students in Ethiopia.

Data sources and search strategies

A systematic review and meta-analysis was conducted using published and unpublished articles on prevalence and associated factors of depression among university students in Ethiopia. The primary studies were found through internet searches using database of PubMed, Google scholar, EMBASE and reference lists of previous prevalence studies. The search comprises both Medical Subject Headings (MeSH) and free text words (title and abstract word searches). We have used the following search terms:

(("Prevalence" OR "magnitude OR incidence") AND ("depression" OR "depression disorder" OR "depression symptom") AND ("university student") AND (Ethiopia)") AND ("risk factor" OR "associated factor"). The limit for language was English and the limit for study category was be human. The reference lists of included studies were manually searched for additional eligible articles. The searching of articles will be carried out from Sep, 2023 to October, 2023 [6].

Eligibility criteria

Inclusion criteria: Cross-sectional study design. All articles published only in English language. All articles which were done in Ethiopia and reporting the prevalence of depression among university students were included. Having response rate of ≥ 80% (it is the proportion of study participants who gave appropriate response to the study among the sample).

Exclusion criteria: Articles without full text and data that is difficult to extract. Studies published in languages other than English. Studies other than cross-sectional studies like case reports, conference reports, national survey reports and expert opinions.

Selection of studies for inclusion in the review

The retrieved titles and abstracts of studies from each database search were managed in an endnote reference manager. Study title and abstracts was examined separately by two authors (STB and FW) and any discrepancies were resolved through discussion.

Data extraction/abstraction

Two researchers (STB, FW) were done data extraction using a standardized and pretested format. Data extraction included: Title, author, publication year, design of the study, study population, sample size, response rate and sampling methods. The overall prevalence rate and prevalence of depression by sex was also extracted. Disagreements on data extractions between the two investigators were solved by discussion and consensus.

Quality assessments

The quality assessment was conducted by three authors (STB, HB and FW) using the checklist of the JBI appraisal tool for cross-sectional, cohort and case-control studies. This tool is included different questions based on the study designs. Our studies were cross-sectional studies so we have used a tool with nine question items. The tools have 'Yes' and 'No' types of questions and scores were given 1 for 'Yes' and 0 for 'No' responses.

Scores was summed and converted into a percentage. Only studies that scored >50% was considered for both systematic review and meta-analysis. For any scoring disagreements, which might happen between the abstractors, the sources of discrepancy were investigated through revision. Disagreements were treated by calculating the average score of the reviewer.

Statistical analysis

In order to transform the prevalence of extracted studies we have used Freeman-Tukey transformation (arcsine square root transformation), which is appropriate for both the fixed and random effects model [7].

Using the back-transformation of the weighted mean of the transformed proportions the pooled proportion was calculated, DerSimonian-Laird weights were used for the random-effects model. Heterogeneity was assessed using the I^2 statistic, which can demonstrate the variation between studies with a percentage. Heterogeneities of 25%, 50% and 75% are considered as low, moderate and high-level heterogeneity, respectively. Due high heterogeneity, the DerSimonian and Laird random-effect model were used to calculate the summary prevalence. To explore the sources of heterogeneity meta regression was performed which attributed to sample size, year of publication [8].

Finally, the Egger weighted regression and Begg rank correlation test methods were used to assess publication bias. All statistical analyses will be performed using STATA14.

RESULTS

Study characteristics

A total of 72 articles were retrieved from databases and related sources. Out of these records and after being their titles and abstracts were inspected, 30 articles were found to be eligible for full text review, from which 13 studies which have been

published between 2015 and 2023 were found to be eligible and included in this meta-analysis (Figure 1). From the eligible articles included in this meta-analysis, a total of 5566 respondents were participated with the response rate of 90.17%-100%. Stratified random sampling technique was employed in the majority of studies to recruit the study participants. From the included studies, four (30.8%) and three (23%) of them used BDI questionnaire and PHQ questionnaire, respectively to assess depression among students [9].
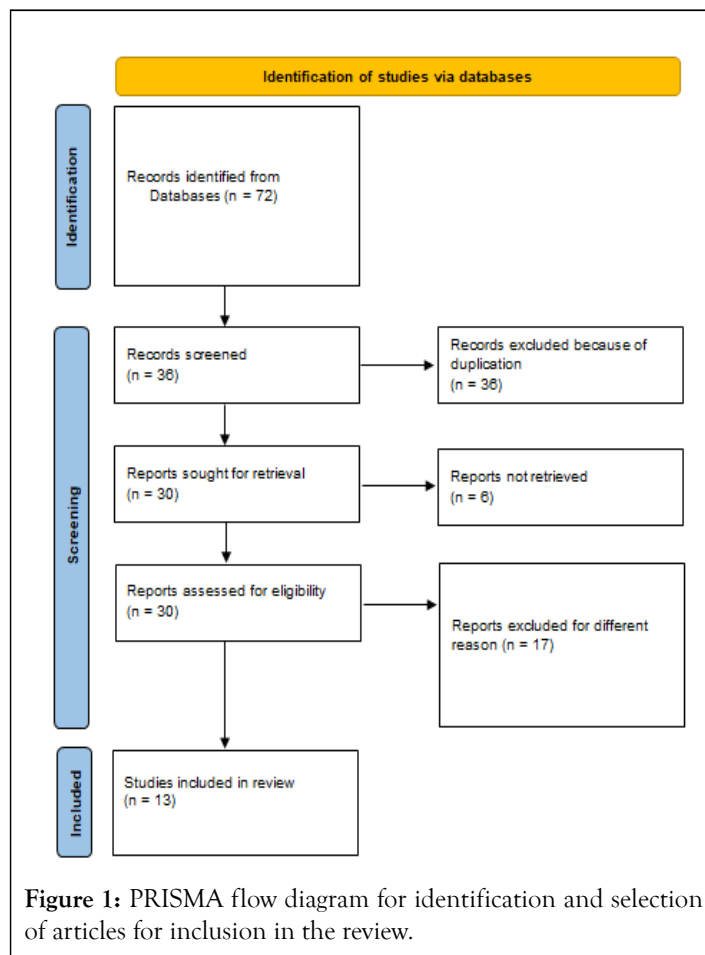

Figure 1: PRISMA flow diagram for identification and selection of articles for inclusion in the review.

Heterogeneity and publication bias

The articles included in this meta-analysis exhibited high heterogeneity, that is, I^2=94.58% and heterogeneity *chi-square*=221.46 (df=12) p-value<0.001. Accordingly, it is indicative to using random effect model. On the other hand, Egger weighted regression statistics (p=0.31) and Begg rank correlation statistics (p=0.18) indicated no evidence of publication bias. In an effort to detect the source of heterogeneity, we have conducted meta-regression on sample size of studies and year of publication, both showed no statistically significant relationship (P=0.45) and (P=0.78), respectively [10].

Prevalence of depression

According to the Der Simonian-Laird random-effects model, the analysis of the included thirteen studies revealed that the pooled prevalence of depression among the Ethiopian University students was found to be 34.0% (95% CI: 28.7%, 39.6%)

(Figure 2). This meta-analysis also revealed that prevalence of depression among males and female students was 31.8% (95% CI: 22.6, 41.8) and 40.8% (95% CI: 34.2, 47.6), respectively, which was estimated by using ten studies and the result showed that the prevalence among females was found to be higher than males' (Figures 3 and 4) [11].
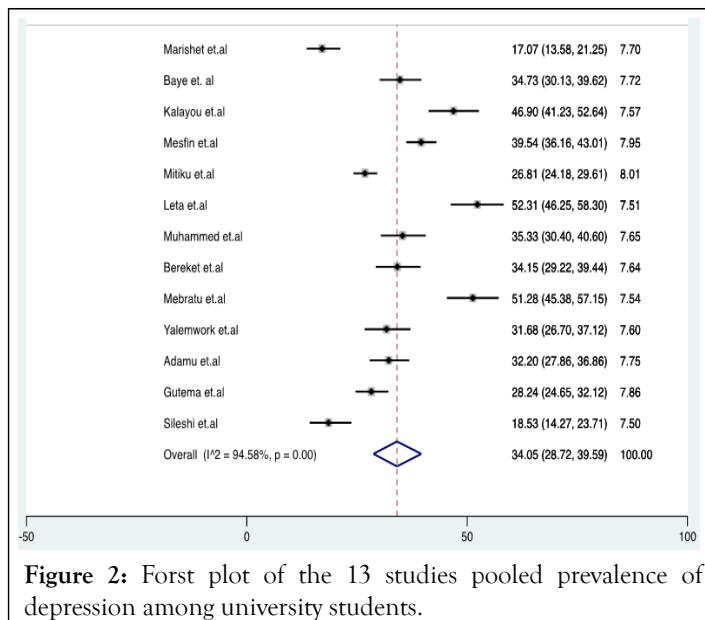

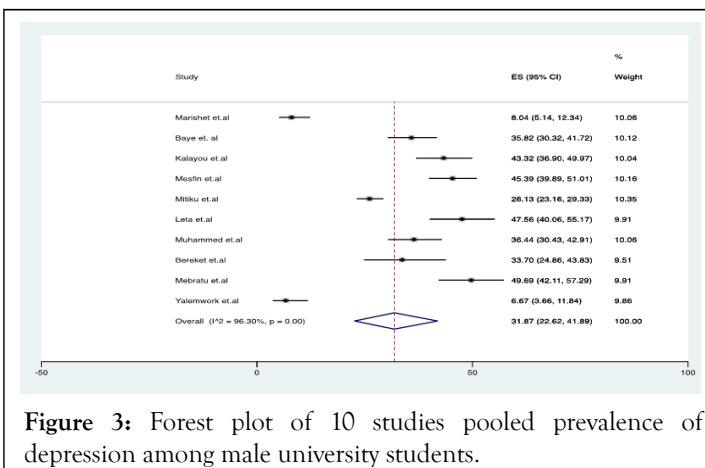**Figure 2:** Forst plot of the 13 studies pooled prevalence of depression among university students.

Figure 3: Forest plot of 10 studies pooled prevalence of depression among male university students.
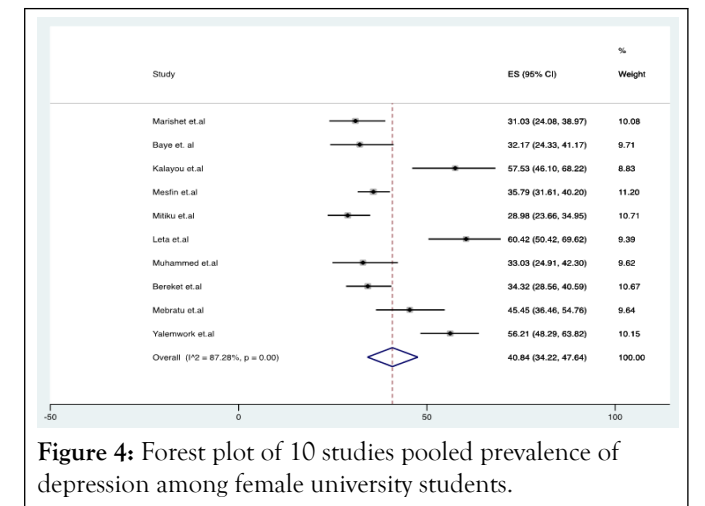

Figure 4: Forest plot of 10 studies pooled prevalence of depression among female university students.

DISCUSSION

This meta-analysis determined the pooled prevalence of depression among Ethiopian university students using thirteen cross-sectional studies. According to the results of this meta-analysis, the prevalence of depression among Ethiopian university was estimated to be 34.0% (95% CI: 28.7%, 39.6%)[12].

The result of this meta-analysis study is in line with the published results of other studies that reports, 33% in Iran, 30.6% in Egypt, 31% in medical students and 34% in nursing students [13].

On the other hand, our finding is inconsistent with previously conducted meta-analysis results. A study conducted in Pakistan university students which included 26 studies the prevalence of depression was estimated to be 42.6%. Those studies reported higher prevalence of depression than our findings. Similarly, a study in Nigeria that analyzed 18 studies, the pooled depression prevalence ranged from 10% to 85% with an overall prevalence of 26%. Another meta-analysis conducted to estimate the prevalence of depression among students in low and middle-income countries which include 37 studies from 20 countries, the result showed that the overall estimate was 24.4%. In addition, meta-analysis that includes 113 studies conducted to assess prevalence of depression among Chinese university students, the result showed that the overall estimate was 28.4%. This might be attributed to different factors for example, study design, the instrument used to assess depression, the number of participants and the nature of participants could be attributed [14].

University students are a unique group of people going through a crucial transition from adolescence to maturity. One of the most difficult times in a person's life is while they are a university student. This is because they have the potential to contribute to society and the nation [15].

University students struggle with a variety of issues, including independent living, academic stress, peer pressure and family issues, which puts them at risk for depression. They may engage in high-risk behaviors including increased smoking, increased drinking and drug use and increased self-harm due to these emotional and mental stresses. Additionally, because depression has been linked to suicidal thoughts, self-destructive behavior and acute infectious diseases, it may also have an impact on their physical and mental health which in turn affects their academic performance [16].

Many studies have found higher level of depression among female students than male students. Similarly, we found high prevalence of depression among female students than male. In the contrary, a meta-analysis conducted among Iranian college students regarding the prevalence depression using 89 studies, the result showed that the estimated overall prevalence of depression was 48% and depression among male was 51% and female 48.9%. This difference may be cultural [17].

There are some limitations to this study. Firstly, studies used difference assessment tools and all studies are observational in design, this could have an impact on the result. Secondly, it was based on limited studies, only 13 studies were included. Thirdly substantial heterogeneity was observed (Figure 5) [18-20].
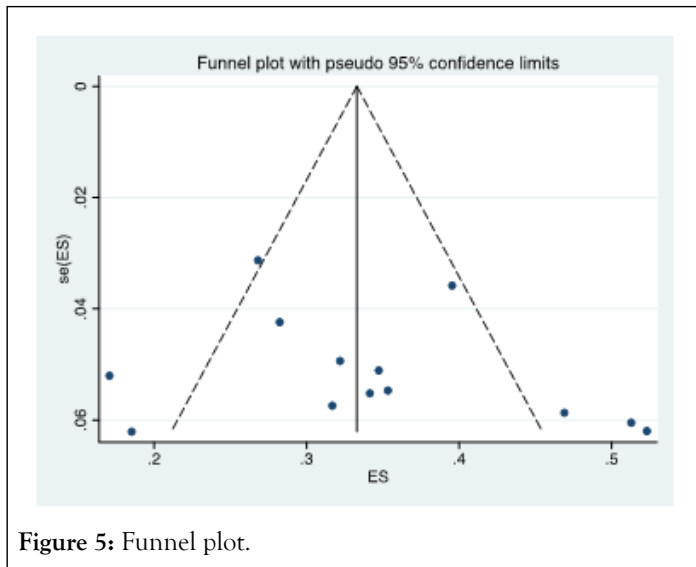

Figure 5: Funnel plot.

CONCLUSION

In summary, we found that depression is common in Ethiopian university students. High prevalence is observed among female students. Our findings point out importance of screening of this vulnerable population and taking appropriate intervention.

In light of the results of the present review, future research on the prevalence of depression and associated factors among higher education students should be conducted.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

AVAILABILITY OF DATA AND MATERIALS

Not applicable.

COMPETING INTERESTS

The authors declare that they have no competing interests.

AUTHORS' CONTRIBUTIONS

STB conceived the study and wrote the initial draft manuscript. HBH, AFA, AFD and FW review and editing the manuscript. STB finalized the manuscript. All authors approved the final manuscript.

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