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Review

Prevalence of depression among nursing students: A systematic review and meta-analysis

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ABSTRACT

Objectives: To examine the global prevalence of depression among nursing students and the variation in depression rates influenced by demographic and educational factors.

Background: Depression affects approximately 350 million people worldwide and is the world's leading cause of disability. Nursing students struggle to cope with not only stressors common in higher education institutions but also anxiety towards clinical placements. Evidence has suggested high prevalence of depression among them, but no reviews have been conducted to report a consolidated prevalence.

Design: Systematic review and meta-analysis.

Review Methods and Data Sources: A search was conducted from November 2015 to January 2016 on CINAHL, EMBASE, Medline OVID, Medline ProQuest, PsycINFO, PubMed, ScienceDirect, and SCOPUS, using a combination of keywords “depression”, “nursing students”, “mood disorder”, “affective disorder”, ‘undergraduate nursing’, “nursing education”, “nursing undergraduate”, and “nursing diploma”.

Results: A total of 27 cross-sectional studies were included. The sample comprised 8918 nursing students and the mean age ranged from 17.4 to 28.4 years. Among these studies, the proportion of female students ranged from 79.0% to 100.0%.

A high pooled prevalence of depression of 34.0% was reported among nursing students. Significant differences in depression prevalence were noted for different subgroups of age, with a higher prevalence noted in younger students (41.0%), and for different geographical regions, with Asian nursing students experiencing a higher prevalence of depression (43.0%). No significant difference was noted between nursing and non-nursing students.

Conclusion: The findings suggest a high prevalence of depression among nursing students. This serves as an impetus for educational reforms in nursing schools and proposes for further research to aid prospective nurses in safeguarding their psychological wellbeing. In the long run, it is imperative that competent nurses be nurtured to improve the standards of healthcare and patients' quality of life.

1. Introduction

Depression is a common mental disorder which affects people of all ages worldwide. Approximately 350 million people globally are affected by the disorder, and the World Health Organization (WHO, 2015a) has declared it to be the world's leading cause of disability. One population with risk factors to both depression and suicide – being of the female gender and aged between 15 and 29 years (Van de Velde et al., 2010; WHO, 2015b) – is nursing students.

Nursing students in higher education institutions are subjected to stressors no different from those of their counterparts in other courses (Shikai et al., 2007), but they do encounter additional stressors unique to their nursing curriculum. Studies examining depression among them have identified clinical placement as a major cause of anxiety and stress which could lead to depression (Gibbons, 2010; Jimenez et al., 2010; Melo et al., 2010; Pulido-Martos et al., 2012). Moreover, studies have reported that professions which involve consistent close human contact and emotional engagement, such as medicine, psychology and nursing, are susceptible to stress and burnout which could manifest as early as before employment (Moreira and Furegato, 2013; Rudman and

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Gustavsson, 2012). Consequently, these could jeopardise the students' prospective work life and their clinical performances.

As there could be repercussions to patient care, it is crucial to consolidate these findings so as to understand the severity of global prevalence of depression among nursing students, as well as its associated factors.

The primary aim of this systematic review and meta-analysis is to investigate the global prevalence of depression among nursing students. In addition, this review intends to compare and examine the effect of demographic and educational factors on prevalence of depression among them. This review aims to answer the following questions: (1) What is the global prevalence of depression among nursing students?, (2) What are the significant factors that influence the prevalence of depression among nursing students? and (3) Is a higher prevalence of depression observed among nursing students than among students in other courses?

2. Methods

2.1. Search Strategy

Prior to performing the systemic search on selected online databases, initial searches were conducted with Google Scholar, Ovid MEDLINE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Medical Subject Headings (MeSH) to identify suitable keywords related to the research problem. In view of the two key concepts of 'depression' and 'nursing students', related terms and synonyms – 'mood disorder' and 'affective disorder'; 'undergraduate nurs*', 'nursing education', 'nursing undergraduate' and 'nursing diploma' – were identified and cross-checked with a second reviewer for their adequacy and coverage of the topic. The search was then conducted from November 2015 to January 2016 on CINAHL, EMBASE, Medline OVID, Medline ProQuest, PsycINFO, PubMed, ScienceDirect, and SCOPUS. To ensure retrieval of all relevant articles, no limitations to date or language was applied during the search and Boolean terms were used to maximise the search results.

2.2. Inclusion and Exclusion Criteria

Included in the review were quantitative cross-sectional studies which had 1) analysed the prevalence of depression among nursing students; 2) presented the prevalence in percentages, or provided sufficient data for percentages to be calculated; 3) utilised standardised validated instruments for assessing the prevalence; 4) presented sufficient data for a meta-analysis of the prevalence for the selected group of nursing students; 5) involved nursing students as a group of their participants; and 6) recruited nursing students undertaking nursing educational programmes offered by hospitals, junior colleges, universities or other tertiary education institutions.

Studies were excluded if they: 1) were unpublished studies; 2) did not provide sufficient data for aggregate prevalence of depression to be calculated; 3) had involved medical, pharmacy, dentistry or other allied healthcare students as part of student group, unless the different groups were clearly defined and the specific aggregate prevalence of depression in solely nursing students could be retrieved; 4) could not be subjected to a full review due to the inaccessibility of their full texts; 5) had full texts written in languages other than English and were untranslatable by any of the present reviewers; and 6) were interventional studies, cohort studies, case-control studies, case reports, case series, newspaper articles, magazine articles, conference papers or commentaries.

2.3. Study Selection

This procedure was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Flow Diagram (Moher et al., 2009). Results returned from the electronic searches were downloaded into Endnote X7.0.2. Duplicates were removed electronically and manually. The remaining articles were subsequently screened for their relevance based on their titles and abstracts. This was conducted by two authors independently (YJT and KL) and the screening results were compared. Discrepancies were discussed and resolved through discussion with the last author (WT). After excluding irrelevant studies, the inclusion and exclusion criteria were applied to remove ineligible articles.

Subsequently, full texts were retrieved for eligible articles and the full review was conducted independently by two authors (YJT and KL). The results were collated by the last author (WT) and reviewed for discrepancies. Discrepancies were resolved through discussion among the reviewers.

2.4. Data Extraction and Methodological Appraisal

Data extraction was conducted independently by the first author and reviewed by both the second and last authors. Data extracted were documented on a standardised form to include the following: first author's last name; year of publication; geographical location; study design; sample population type; number of nursing students (n) (and non-nursing students, if applicable); mean age of nursing students; percentage of female students; measurement tools utilised to assess depression and cut-off scores used therein; overall prevalence of depression among nursing students (p) (and non-nursing students, if applicable); prevalence of depression in selected subgroups (e.g. year of study); and type of publication.

The final included articles were appraised for their methodological quality using the National Institutes of Health Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (NIH-QAT; National Institutes of Health, 2014). The tool assesses the studies for their clarity of research objectives, adequacy of study population description, appropriateness of sample selection, presence of sample size justification, exposure and outcome measurement, sufficiency of study timeframe, presence of follow-ups, and adequacy of statistical analyses. The quality assessment was conducted by the first and second authors independently, whereas the last author compared and collated the results. Discrepancies were discussed and resolved between the authors.

2.5. Data Synthesis

2.5.1. Statistical Analyses

The data extracted was utilised to compute the standard error of the prevalence of depression (SE) for each included study, using the below equation (Collett, 2003), number of nursing students (n) and prevalence of depression in nursing students (p). This was conducted for the overall prevalence and for the prevalence among the subgroups identified.

$$SE = \sqrt{\frac{p \times (1 - p)}{n}}$$

All statistical analyses for this review were conducted using the Review Manager (Version 5.3)(RevMan, 2014). Additional statistical analysis for significance testing on subgroup differences was done with the IBM SPSS Statistics (Version 23.0) (2015). A meta-analysis was conducted to perform comparisons across all studies with dichotomous outcomes (absence of symptoms of depression vs. presence of such symptoms). The prevalence was computed for each study in this review to derive a pooled effect estimate with the inverse variance method, which involved calculating the weighted average using standard errors (Polit and Beck, 2014), as aforementioned.

The results were combined using the random-effects model. This model was adopted as it considers not only the sampling errors and possible heterogeneity across the studies, but also the true effect sizes of individual studies (DerSimonian and Kacker, 2007). In this review,