Education-based interventions for anxiety during the treatment and management of chronic disease: a systematic review protocol

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ABSTRACT

Objective: The objective of this systematic review is to evaluate the effectiveness of education-based interventions to decrease patient anxiety during the treatment and management of a chronic disease.

Introduction: Anxiety is a major contributor to poor patient outcomes in self-managed chronic disease. Health care manage anxiety prior or during education can adversely affect patient outcomes. By identifying interventions that effectively decrease anxiety, clinicians may be able to consider and implement strategies as standard practice within the education-based programs.

Inclusion criteria: The proposed systematic review will consider studies reporting the effectiveness of any intervention aimed at decreasing participant anxiety prior to a medical procedure or prior to undertaking an education-based program to address a technical aspect of self-management in a health care setting. It will consider studies whose participants are 18 years and older and who are diagnosed with a chronic disease.

Methods: The systematic review aims to find published and unpublished studies in English from 1972 onward. Databases to be searched included MEDLINE, CINAHL, Embase, ERIC, Mosby's index, Cochrane Library, and Scopus. Studies will be reviewed and data extracted by two independent reviewers. The data will include details about the interventions, populations, study methods, and outcomes of significance to the review objectives. Where possible, data will be pooled in a statistical meta-analysis.

Systematic review registration number: PROSPERO CRD42019142260

Keywords anxiety; chronic disease; education; self-management; training

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Introduction

Internationally, individuals with a chronic disease can present a substantial burden for health care systems. The World Health Organization (WHO) reported 40.5 million deaths worldwide due to non-communicable, chronic disease in 2016.[1] In the Australian population, chronic disease accounted for 80% of all deaths reported in 2016.[2] Chronic disease refers to a broad range of long-lasting and complex health conditions associated with progressive physical and cognitive deficits that contribute to decreased quality of life.[3] Conditions such as diabetes,[4] chronic kidney disease,[5] sleep apnea,[6] and chronic obstructive pulmonary disease[7] make up the vast majority of these cases while simultaneously requiring a high-level of autonomous care to manage the disease.

Successful self-management is highly dependent on the individual, and is influenced by several factors including health literacy, cognitive status, sleep disturbances, level of wellness, and the ability to learn and retain technical aspects of medical procedures while experiencing existential life changes.[6,8] Self-management is where an individual takes on the responsibility for their own chronic disease treatment/management.[6] The WHO recognizes self-management to be a necessary part of treatment.[3] Self-management can relate to learning self-administered treatments through the use of any medical devices or undergoing regular procedures, which may heighten an individual's anxiety level.[8] As a normal response to

chronic disease, many people experience anxiety, which contributes to deleterious effects on memory and concentration, which in turn adversely affects learning processes.[8,9] Consequently, interventions that support and improve the psychological well-being, particularly with regards to anxiety, of people acquiring these skills are necessary components in any chronic disease education/management program.

Anxiety is a major contributor to poor patient outcomes in self-managed chronic disease. Between 2014 and 2016 the prevalence of anxiety rose by 28% in the Australian population.[10] People with anxiety secondary to chronic disease may experience increased symptom burden, treatment complications, and decreased quality of life.[9] Anxiety is a multifaceted phenomenon and can be categorized dichotomously as being "state" anxiety or "trait" anxiety. These categories allow anxiety to be conceptualized in two ways: state anxiety is a temporary emotional state, while trait anxiety is an underlying and consistent personality attribute.[11] State anxiety describes the experience of unpleasant feelings associated with threatening demands or situations, such as having to learn a clinical technique to self-manage an aspect of chronic disease, which may result in an acute response to avoid the situation.[12] Conversely, trait anxiety describes a personality characteristic rather than a temporary emotion that varies in intensity, duration, and the range of stressful situations in which it occurs.[11]

Health care professionals are under increasing pressure to achieve improved patient outcomes with less time and fewer resources.[8] Enabling adequate time for preparation is a significant barrier in patient education.[8] Failing to recognize and manage anxiety prior to or during chronic disease education can adversely affect expected patient outcomes.[9] Elevated anxiety levels may negatively influence people's ability to understand the management of their chronic disease and may intensify for those who need to learn technical procedures to self-manage their condition.[9,13] Deyirmenjian et al.[14] used a quasi-experimental design to examine the effectiveness of preoperative patient education for anxiety levels and recovery in Lebanese patients undergoing open-cardiac surgery. Participants assigned to the experimental group (n = 57) received a special educational session on their admission day with a tour of the cardiac surgery unit. The participants assigned to the control group (n = 53) received the normal hospital

protocol routine, which did not include a tour or preoperative education. Results on preoperative and postoperative anxiety only showed a borderline statistical significance between the two groups ($P = 0.05$). The findings of this study did not support previous published studies[13,15] that have demonstrated the benefits of preoperative education. This may have been due, in part, to cultural factors but suggests that state anxiety interferes with learning, whereby patients may be too anxious to comprehend educational information received on the day of the procedure. This, in turn, does not allow sufficient time to process the information and relieve the associated anxiety. Due to decreased time preventing patients from processing information, the length of time patients spend undertaking an education-based intervention may need investigating.

Strategies that decrease anxiety need to be integrated within chronic disease education. Consequently, interventions that effectively decrease anxiety in individuals undergoing a medical procedure to manage their chronic disease or receiving education need to be identified and appraised. In doing so, clinicians may be able to consider and implement strategies as standard practice within the education-based programs.

A preliminary search in the *JBI Database of Systematic Reviews and Implementation Reports*, CINAHL, MEDLINE, PubMed, and PROSPERO identified no existing systematic reviews on the effectiveness of interventions to decrease patient anxiety during the treatment and management of chronic disease.

Review objectives

The primary objective of this systematic review is to identify, appraise, and synthesize the best available evidence regarding the effectiveness of education-based interventions to decrease patient anxiety during the treatment and management for chronic disease.

The secondary objective is to evaluate the length of time a patient spends completing an education-based intervention.

Inclusion criteria
Participants

This review will consider studies whose participants are 18 years and older, who have been diagnosed with a chronic disease, and are undergoing a medical procedure or undertaking an education-

based program regarding a technical aspect of self-management.

For the purpose of this review, chronic disease is defined as any chronic condition requiring treatment and management. Chronic disease is discussed in terms of four major disease groups: cardiovascular disease, cancer, chronic obstructive pulmonary disease, and diabetes.[3,8]

Medical procedure is defined as any invasive surgery used for chronic disease treatment that is performed by any medical professional.[6]

An education-based intervention is defined as any training used to provide patients with the acquisition of knowledge and skills to undertake and manage technical aspects of their chronic condition.[8,14] For example, patients learning to use continuous positive airway pressure devices in sleep apnea,[6] insulin pumps in diabetes,[4,13] or renal replacement therapy in end-stage kidney disease.[5]

Interventions

This review will consider studies that report the effectiveness of any education-based intervention aimed at decreasing participant anxiety prior to a medical procedure as part of their chronic disease treatment or prior to undertaking an education-based program to manage a technical aspect of self-management in a health care setting.

For the purpose of this review, education-based interventions can be any form of educational didactics, including face-to-face learning, e-learning, infographics, videos, and pamphlets.

Comparators

The review will consider studies that compare an intervention to another intervention.

Studies that use no comparator (ie, no intervention) will be excluded.

Outcomes

This review will consider studies that include the following outcome measures:

- Anxiety. Studies should measure this outcome using a validated instrument such as the State-Trait Anxiety Inventory (STAI).[16] If outcomes are assessed using non-validated instruments, outcomes will be synthesized narratively in the final report.
- Time taken to learn the education-based intervention. Studies should measure this outcome by

using a self-reported log or via a login/logout method (if education-based intervention is online) or by observation (if education-based intervention is face-to-face).

Types of studies

This review will consider both experimental and quasi-experimental study designs including randomized controlled trials, before and after studies, program evaluation, and multicenter studies.

Methods

The proposed systematic review will be conducted in accordance with the JBI methodology for systematic reviews of effectiveness.[17] The review has been registered in PROSPERO: CRD42019142260.

Search strategy

The search strategy will aim to find published and unpublished studies. A preliminary search of MEDLINE, PubMed, and CINAHL will be undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. Medical Subject Headings (MeSH) terms will be checked to ensure terms used are covered in the search. A full search strategy for Ovid MEDLINE is included in Appendix I, which will be tailored to each database. The search strategy has been devised in conjunction with a research librarian. The reference lists of all studies selected for critical appraisal will be manually screened for further studies.

The databases to be searched include CINAHL, Cochrane Reviews, Cochrane – Other Reviews, Cochrane Trials, Embase, ERIC, MEDLINE, Mosby's Index, and Scopus. Sources of unpublished studies and gray literature to be searched include Google Scholar, Virginia Henderson Library, MedNar, and ProQuest databases.

Studies published in English from 1972 onward will be considered for this review. This time frame was selected as it corresponded historically with one of the first self-management procedures reported in the literature.[18]

Study selection

Following the search, all identified citations will be collated and uploaded into EndNote X18/2018 (Clarivate Analytics, PA, USA) and duplicates removed. Titles and abstracts will then be screened

by two independent reviewers for assessment against the inclusion criteria for the review. Potentially relevant studies will be retrieved in full and their citation details imported into the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI; JBI, Adelaide, Australia). The full text of selected citations will be assessed in detail against the inclusion criteria by two independent reviewers. Reasons for exclusion of full-text studies that do not meet the inclusion criteria will be recorded and reported in the systematic review. Any disagreements that arise between the reviewers at each stage of the study selection process will be resolved through discussion or with a third reviewer. The results of the search will be reported in full in the final systematic review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.[19]

Assessment of methodological quality

Selected papers will be critically appraised by two independent reviewers for methodological quality using the standardized critical appraisal instruments from JBI SUMARI. For the following study types, a quality threshold will be established: randomized controlled trial criteria 6–11 and quasi-experimental criteria 6–8 are considered essential for methodological rigor of appropriate studies. In this context, only studies meeting these criteria will be considered. Any disagreement between reviewers will be resolved through discussion or with a third reviewer. Following critical appraisal, studies that do not meet the quality threshold will be excluded. The results of the critical appraisal will be reported in a narrative form and in a table.

Data extraction

Two reviewers will extract data independently from papers included in the review using the standardized data extraction tool from JBI SUMARI. The data extracted will include details about interventions, populations, study methods, and the outcomes of significance to the review question and primary objective (education-based interventions used to decrease patient anxiety during the treatment and management of chronic disease). Any disagreements between the reviewers will be resolved through discussion or with a third reviewer.

Data synthesis

Studies will, where possible, be pooled in statistical meta-analysis using JBI SUMARI. Effect sizes will be expressed as weighted mean differences with 95% confidence intervals. Heterogeneity will be assessed statistically using the standard χ^2 and I^2 tests. The choice of model (random or fixed effects) and method for meta-analysis will be based on guidance by Tufanaru et al.[20] Where statistical pooling is not possible, the findings will be presented in narrative form including tables and figures to aid in data presentation where appropriate. A funnel plot will be generated to assess publication bias if there are 10 or more studies included in a meta-analysis. Statistical tests for funnel plot asymmetry (Egger test, Begg test, Harbord test) will be performed where appropriate.

Assessing certainty in the findings

The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach for grading the certainty of evidence will be followed[21] and a Summary of Findings will be created using GRADEpro GDT 2015 (McMaster University, ON, Canada). The Summary of Findings will present the following information where appropriate: absolute risks for the treatment and control, estimates of relative risk, and a ranking of the quality of the evidence based on the risk of bias, directness, heterogeneity, precision, and risk of publication bias of the review results. The outcomes reported in the Summary of Findings will be the impact on participants' anxiety levels and the length of time a patient spends completing an education-based intervention.

References

1. World Health Organization. NCD mortality and morbidity [Internet]. 2018 [cited 2019 Feb 10]. Available from: https://www.who.int/gho/ncd/mortality_morbidity/en/.
2. Australian Bureau of Statistics. Causes of Death, Australia [Internet]. 2017 [cited 2019 Feb 10]. Available from: https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/3303.0~2017~Main%20Features~Australia's%20leading%20causes%20of%20death,%202017~2.
3. World Health Organization. Global status report on non-communicable diseases [Internet]. 2014 [cited 2019 Feb 10]. Available from: https://www.who.int/nmh/publications/ncd-status-report-2014/en/.
4. Wu S, Huang Y, Liang S, Wang T, Lee M, Tung H. Relationships among depression, anxiety, self-care behaviour and

diabetes education difficulties in patients with type-2 diabetes: a cross-sectional questionnaire survey. Int J Nurs Stud 2011;48(11):1376–83.

5. Cukor D, Ver Halen N, Fruchter Y. Anxiety and quality of life in ESRD. Semin Dial 2013;26(3):265–8.

6. Rezaeitalab F, Moharrari F, Saberi S, Asadpour H, Rezaeetalab F. The correlation of anxiety and depression with obstructive sleep apnea syndrome. J Res Med Sci 2014;19(3):205–10.

7. Pumar MI, Gray CR, Walsh JR, Yang IA, Rolls TA, Ward DL. Anxiety and depression – important psychological comorbidities of COPD. J Thorac Dis 2014;6(11):1615–31.

8. Beagley L. Educating patients: understanding barriers, learning styles, and teaching techniques. J Perianesth Nurs 2011;26(5):331–7.

9. DeJean M, Giacomini M, Vanstone M, Brundisini F. Patient experiences of depression and anxiety with chronic disease: a systematic review and qualitative meta-synthesis. Ont Health Thechnol Assess Ser 2013;13(16):1–33.

10. Beyond Blue. Chronic physical illness, anxiety and depression [Internet]. Beyondblue; 2017 [cited 2019 Mar 15]. Available from: https://das.bluestaronline.com.au/api/prism/document?token=BL/0124.

11. Dayılar H, Oyur G, Kamer E, Sarıçiçek A, Cengiz F, Hacıyanlı M. Evaluation of anxiety levels of patients before colon surgery. Turk J Colorectal Dis 2017;27(1):6–10.

12. Siekkinen M, Pyrhönen S, Ryhänen A, Vahlberg T, Leino-Kilpi H. Psychosocial outcomes of e-feedback of radiotherapy for breast cancer patients: a randomized controlled trial. Psychooncology 2015;24(5):515–22.

13. Chai S, Yao B, Xu L, Wang D, Sun J, Yuan N, et al. The effect of diabetes self-management education on psychological status and blood glucose in newly diagnosed patients with diabetes type 2. Patient Educ Couns 2018;101(8):1427–32.

14. Deyirmenjian M, Karam N, Salameh P. Preoperative patient education for open-heart patients: a source of anxiety? Patient Educ Couns 2006;62(1):111–7.

15. Guo P, East L, Arthur A. A preoperative education intervention to reduce anxiety and improve recovery among Chinese cardiac patients: a randomized controlled trial. Int J Nurs Stud 2012;49(2):129–37.

16. Spielberger CD, Gorsuch RL, Lushene R, Vagg PR, Jacobs GA. Manual for the State-Trait Anxiety Inventory. Palo Alto, CA: Consulting Psychologists Press; 1983.

17. Brewer TE, Caldwell FT, Patterson RM, Flanigan WJ. Indwelling peritoneal (Tenckhoff) dialysis catheter. Experience with 24 patients. JAMA 1972;219(8):1011–5.

18. Aromataris E, Munn Z, editors. JBI Reviewer's Manual [Internet]. Adelaide: JBI; 2017 [cited 2019 Jun 10]. Available from: https://reviewersmanual.joannabriggs.org/.

19. Moher D, Liberati A, Tetzlaff J, Altman DG; the PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS Med 2009; 6(7): e1000097.

20. Tufanaru C, Munn Z, Stephenson M, Aromataris E. Fixed or random effects meta-analysis? Common methodological issues in systematic reviews of effectiveness. Int J Evid Based Healthc 2015;13(3):196–207.

21. Schunemann H, Brożek J, Guyatt G, Oxman A, editors. Handbook for grading the quality of evidence and the strength of recommendations using the GRADE approach (updated October 2013): GRADE Working Group [Internet]. 2013 [cited 2018 Jul 20]. Available from: gdt.guidelinedevelopment.org/app/handbook/handbook.html.

Appendix I: Search strategy

Ovid MEDLINE(R) 1972 to October, Parameters, English; search conducted on October 25, 2019

1 Programmed Instruction as Topic/ 2484

2 Educational Technology/ 1418

3 Internet/ 67,646

4 (elearning or "e-learning").mp. 2492

5 ((web or internet or computer or virtual or online or distance or distributed or blended) adj2 (learning or course* or education or teaching or instruction or module* or course or curricul*)).mp. 21,055

6 ((web or internet or computer) adj (aided or assisted or supported of based or enhanced) adj2 (learning or course* or education or teaching or instruction or module* or course or curricul*)).mp 11,874

7 (webct or blackboard or learning management system*).mp. 496

8 1 or 2 or 3 or 4 or 5 or 6 or 7 87,554

9 exp health occupations/ or exp specialties, surgical/ 1,619,494

10 "internship and residency"/ or exp schools, health occupations/ 85,432

11 exp Students, Health Occupations/ 63,496

12 (health* professional* or health* personnel or physician* or nurs* or dental or student* or medical).tw,kw. 2,064,491

13 9 or 10 or 11 or 12 3,327,620

14 (efficien* or effective* or enhanced or improved or satisf*).mp. 4,028,916

15 (pretest or "pre test*" or "before and after").mp. 270,743

16 Clinical Trial/ 515,297

17 Randomized Controlled Trial/ 478,613

18 Comparative Study/ 1,825,094

19 Program Evaluation/ 58,934

20 Multicenter Study/ 247,430

21 (random* or trial or groups or comparative stud* or evaluative stud* or program evaluation or multicen* stud*).tw,kw. 2,950,063

22 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 7,791,122

23 8 and 13 and 22 16,956

24 limit 23 to yr = "2009 -Current" 10,575

25 Patient Education as Topic/ 81,582

26 24 not 25 9949