Effectiveness of non-pharmacological interventions to manage anxiety in adolescents in the perioperative period: a systematic review protocol

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ABSTRACT

Objective: This review aims to evaluate the effectiveness of non-pharmacological interventions to manage anxiety in adolescents in the perioperative period.

Introduction: Adolescents undergoing surgery suffer considerable levels of anxiety and distress before surgery, which are maintained beyond the procedure. Although the benefit of non-pharmacological interventions in this area is significant, their efficacy is still under-studied.

Inclusion criteria: This review will consider studies that focus on adolescents aged 10 to 19 years, who have undergone a surgical procedure. All studies that focus on non-pharmacological interventions occurring in the perioperative period designed to reduce anxiety without restrictions on comparators, geography, or culture will be included.

Methods: An initial limited search of PubMed and CINAHL has been undertaken and will be followed by a second search for published and unpublished studies, without limitations of publication date, in major health care–related electronic databases. Studies in English, Spanish, and Portuguese will be included. After full-text studies are retrieved, methodological quality assessment and data extraction will be performed independently by two reviewers. A narrative synthesis will accompany the results and, if possible, a meta-analysis will be performed and a Grading of Recommendations, Assessment, Development and Evaluation (GRADE) Summary of Findings presented.

Systematic review registration number: PROSPERO (CRD42020184386)

Keywords: adolescent; anxiety; complementary therapy; non-pharmacological interventions; perioperative care


Introduction

In the United States of America (USA) there are about seven million adolescents who undergo surgery each year1 and up to 65% of them are estimated to experience considerable anxiety and distress before surgery.2 Even if the surgical procedure is well-known it can be a distressing and overwhelming experience for the adolescent.3

According to the World Health Organization, “adolescence” is the phase of life between childhood and adulthood, from ages 10 to 19.4 Adolescents experience rapid physical, cognitive, and psychosocial growth; however, their physical growth precedes their cognitive maturation.5 According to their developmental characteristics, adolescence is divided into three stages, specifically: early adolescence (10 to 14 years), medium adolescence (15 to 16 years) and late adolescence (17 to 19 years).6
“Anxiety” is defined as a vague and uncomfortable feeling of discomfort or fear, accompanied by an autonomic response and a feeling of apprehension caused by the anticipation of danger. Factors that increase anxiety levels in the perioperative period are fear of the unknown, perception of physical injuries, pain, loss of control, uncertainty of what is expected, and separation from family routines. Anxiety levels may also be higher when there is no preoperative preparation. Consequently, the higher the levels of anxiety, the greater the negative emotions in adolescents, and the more difficulty they may have in cooperating with health care professionals. An adolescent’s anxiety levels in the perioperative period are measured using several instruments, such as State-Trait Anxiety Inventory (STAI-Y), State-Trait Anxiety Inventory for Children (STAI-C), Visual Analogue Scale for Anxiety (VAS-A), modified Yale Preoperative Anxiety Scale (mYPAS), or a Zero to 10 numeric rating scale (NRS).

Non-pharmacological interventions, such as cognitive-behavioral techniques (eg, distraction, imagery, preparation information, positive reinforcement, relaxation, and breathing techniques), physical methods (eg, positioning and massage), and emotional support (eg, presence, touch, and comforting), can be used to reduce anxiety. Thus, the implementation of non-pharmacological interventions entails the application of any of these methods or techniques for anxiety prevention without involving drug administration, and several of these options are already in use with adolescents in the perioperative period, such as distraction, guided imagery, hypnosis, music therapy, music, or massage. The importance of these interventions is the change they initiate in the meaning attributed to the anxiety-causing agent. Through its application, cognitive restructuring is achieved, oriented to the anxiety-causing agent. Through its application, the change they initiate in the meaning attributed to the anxiety-causing agent.

Lastly, the perioperative period comprises three phases: preoperative, intraoperative, and postoperative. The preoperative phase starts when the patient is informed of the need for surgical intervention and includes all events up to the scheduled surgical procedure (preparation for the surgery). The intraoperative phase consists of the actual surgical procedure (management strategies). Finally, the postoperative phase starts in the post-anesthesia care unit (PACU) and lasts until the patient returns to their usual roles and responsibilities (post-surgical management and recovery at home).

In the last decade, a significant investment has been made in studying the neurocognitive development processes of adolescents to explain why they respond and behave differently from children and adults. Similarly, a decade ago, Fortier and colleagues outlined the need to develop primary studies in the perioperative context, including only adolescents in their samples. Since then, several studies have examined non-pharmacologic interventions in the perioperative period and included adolescents in the studied population. Manyande and colleagues focused on the effects of non-pharmacologic interventions in assisting induction of anesthesia in children (zero to 18 years) by reducing their anxiety and distress or increasing their cooperation.

Chiang and colleagues examined the relationship between perioperative anxiety and postoperative pain in children and adolescents undergoing elective surgical procedures. Woragidpoonpol and colleagues evaluated the best available evidence related to the use and effectiveness of non-pharmacological interventions as an adjuvant therapy to pharmacological interventions and the perceptions and/or pain behaviors in children aged 0 to 19 years who had undergone major surgery. None of these studies included the adolescent population only. Additionally, a recent scoping review aimed at mapping the non-pharmacological interventions to prevent anxiety in adolescents in the perioperative period identified that there is sufficient literature concerning non-pharmacologic interventions delivered to adolescents in the perioperative to conduct a systematic review and analyze the effectiveness of these interventions with this specific population.

There is a need to summarize findings focusing on the effectiveness of non-pharmacological interventions in the prevention of anxiety in the perioperative to provide the best evidence to health care professionals who work with adolescents in the perioperative context.

A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and the JBI Database of Systematic Reviews and Implementation Reports was conducted and no current or in-progress systematic reviews on the topic were identified.

The objective of this review is to evaluate the effectiveness of non-pharmacological interventions...
to manage anxiety in adolescents in the perioperative period.

**Review question**

What is the effectiveness of non-pharmacological interventions to manage anxiety in adolescents in the perioperative period?

**Inclusion criteria**

**Participants**
The review will consider studies that include adolescents aged 10 to 19 years old who have undergone a surgical procedure, regardless of the type of surgery (including ambulatory, minor, or major surgery), and who participated in non-pharmacological interventions in the perioperative period to reduce anxiety. Studies involving adolescents previously diagnosed with a psychiatric illness will be excluded.

**Interventions**

This review will consider studies that evaluate non-pharmacological interventions. For this purpose, non-pharmacological interventions include, but are not limited to, any treatment that is not a registered drug, such as massage, hypnosis, guided imagery, music therapy, music, and virtual reality. Any other non-pharmacological interventions used in the perioperative context with adolescents to prevent anxiety may be added. There are no limitations to frequency, intensity, or who delivers the intervention.

**Comparators**

This review will consider studies that compare the non-pharmacological intervention or a combination of non-pharmacological interventions to other comparators. It can include another non-pharmacological intervention, usual care, or no treatment control.

**Outcomes**

This review will consider studies that include outcomes that measure anxiety levels on adolescents in the perioperative period. This outcome could be measured using STAI-Y, STAIC, VAS-A, mYPAS, NRS, or other instruments to evaluate anxiety level in adolescents.

**Context**

There are no context constraints in this review.

**Types of studies**

This review will consider both experimental and quasi-experimental study designs including randomized controlled trials, non-randomized controlled trials, quasi-experimental, before and after studies, prospective and retrospective cohort studies, case control studies, and analytical cross-sectional studies. Individual case reports, case series, and systematic reviews will be excluded. Studies published in English, Spanish, and Portuguese will be included. There will be no date, geographical, or cultural limitations for the acceptance of studies.

**Methods**

This protocol followed the PRISMA-P guidelines. The proposed systematic review will be conducted in accordance with JBI methodology for systematic reviews of effectiveness evidence. This protocol has been registered in PROSPERO (CRD42020184386).

**Search strategy**

The search strategy aims to locate both published and unpublished studies. A three-step search strategy will be utilized in this review. An initial limited search of PubMed was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy for PubMed (see Appendix I). The search strategy, including all identified keywords and index terms, will be adapted for each included information source. The reference list of all studies selected for critical appraisal will be screened for additional studies.

The databases to be searched will include MEDLINE via PubMed, CINAHL via EBSCO, PsycINFO via EBSCO, SciELO, and Cochrane Central Register of Controlled Trials via EBSCO. The search for unpublished studies and gray literature will include Open Grey and RCAAP - Portugal Open Access Scientific Repository.

**Study selection**

Following the search, all identified citations will be collated and uploaded into EndNote v.X8 (Clarivate Analytics, PA, USA) and duplicates removed. Titles and abstracts will then be screened by two independent reviewers (MJP and MPS) for assessment.
against the inclusion criteria of 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 (MJP and MPS). 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 (ES). 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.

**Assessment of methodological quality**

Eligible and selected studies will be critically appraised by two independent reviewers (MJP and MPS) at the study level for methodological quality in the review, using standardized JBI critical appraisal instruments for experimental and quasi-experimental studies. Authors of papers will be contacted to request missing or additional data for clarification, where required. Any disagreements that arise will be resolved through discussion or with a third reviewer (ES). Following the critical appraisal, studies will not be excluded based on their methodological quality; however, the results of the critical appraisal will be considered in the synthesis of the evidence and reported in narrative and tabular form. All studies, regardless of the results of their methodological quality, will undergo data extraction and synthesis.

**Data extraction**

Data will be extracted from studies included in the review by two independent reviewers (MJP and MPS), using the standardized data extraction form developed by JBI. Once again, any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer (ES). Authors of papers will be contacted to request missing or additional data, where required. The data extracted will include specific details about the setting, population (adolescent subgroups), study methods, interventions, and outcomes of significance to the review question. Details will be modified and revised for each study as necessary during the data extraction process.

**Data synthesis**

Studies will, where possible, be pooled in statistical meta-analysis using JBI SUMARI. Effect sizes will be expressed as either odds ratios (for dichotomous data) and weighted (or standardized) final post-intervention mean differences (for continuous data), and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed statistically using the standard $\chi^2$ and $I^2$ tests. Statistical analyses will be performed using random effects models only in the presence of moderate to high heterogeneity ($I^2 > 50\%$) and, in their absence, fixed effects models will be used instead. Subgroup analyses will be conducted where there is sufficient data to investigate, based on the different study designs, settings/contexts, and age categories. Sensitivity analyses will be conducted to test decisions made regarding the inclusion of any mega-trials. A funnel plot will be generated using JBI SUMARI to assess publication bias if there are 10 or more studies included in a meta-analysis. Statistical tests for funnel plot asymmetry will be performed where appropriate. 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.

**Assessing certainty in the findings**

The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach for grading the certainty of evidence will be followed and a Summary of Findings will be created using GRADEPro software (McMaster University, ON, Canada). The Summary of Findings will present the following information where appropriate: the absolute risks for the treatment and control, estimates of relative risk, a ranking of the quality of the evidence-based information on the risk of bias, the directness, heterogeneity, precision, and risk of publication bias of the review results. All outcomes will be included in the Summary of Findings.

**Acknowledgments**

The Health Sciences Research Unit: Nursing (UICSI-SA:E), hosted by the Nursing School of Coimbra (ESEnFC), for their support.
This review will contribute towards a PhD in Nursing Sciences for the first author, MPS.

References

Appendix I: Search strategy

MEDLINE (PubMed)
Search conducted June 21, 2020

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Filters: English, Portuguese, Spanish