

TITLE: The effectiveness of learning strategies for the development of Emotional Intelligence in undergraduate nursing students: A systematic review protocol

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ABSTRACT:

Aim: This protocol proposes a systematic review to identify and disclose learning strategies and evaluation tools to improve Emotion Intelligence (EI) in undergraduate nursing students.

Background: EI improves the ability to manage emotions and their consequences. Management of emotions is fundamental in nursing both at inter- and intra-professional levels, and with the patients and their family carers.

Design: Systematic review protocol of effectiveness based on the Joanna Briggs Institute (JBI) guidelines.

Review methods: All articles based on educational programmes and/or activities to develop EI in nursing curricula will be included in the review. It will analyse the principle EI attributes and outcomes such as burnout, intention to leave and problem-solving skills. Based on the review question, seven databases will be searched: MEDLINE, The Cochrane Library, SCOPUS, CINAHL, EMBASE, PsycINFO and ERIC. Also, grey literature (Google Scholar and Open Gray) will be searched. Since no similar systematic reviews are present in the literature, no time limits will be set. To establish the quality of studies JBI tools will be used. When appropriate, we will meta-analyse prevalence and incidence estimates or we will meta-synthesize themes and findings.

Expected Results: This systematic review is expected to provide an overview of educational and training methods, pedagogical strategies and evaluation tools to address EI in nursing and provide high-quality care to patients and their families. Results of the review will support nursing educators and leaders in implementing teaching and learning strategies to improve the Emotional Intelligence of undergraduate nursing students.

Conclusions: Mastering emotions is fundamental for nurses. Implementing education courses based on EI according to the best training methods and pedagogical strategies could become key for nursing curricula. Moreover, after the review, it will be possible to identify the best training methods and pedagogical strategies for implementing continuing professional development (CPD) courses in EI in the courses of following graduation.

Keyword: Education; Students; Nursing; Emotional intelligence; Systematic Review

MAIN TEXT**1. Introduction**

It is widely recognised that Emotional Intelligence (EI) improves an individual's ability to manage emotions and their consequences from a relational and social point of view, especially in the healthcare setting (Molero-Jurado et al., 2019; Carragher & Gormley, 2017). In nursing, social and relational aspects are fundamentals both at inter- and intra-professional levels (Carragher & Gormley, 2017), both with the patients and their caregivers (Alsufyani et al., 2020). Being emotionally intelligent implies the ability to face, understand and feel one's own emotions and those of others, and to respond and act accordingly intra-personally, inter-personally, manage stress, adapt to situations, and in terms of general mood (Nel et al., 2013; Molero-Jurado et al., 2019). Studies conducted on EI in the nursing field have demonstrated a correlation between emotional competencies and increased success and commitment in nursing care (Walker and Campbell, 2013) and how having social skills enables nurses to perform successfully and with a deeper involvement (Carvalho et al., 2018). From Goleman's point of view, EI is defined as: "the capacity for recognising our own feelings and those of others, for monitoring ourselves, and for managing emotions in ourselves and our relationships" (Goleman, 1998 – p. 317). In the nursing literature, the term EI began to appear in the years 2000 (Parsa-Yekta & Abdolrahimi, 2015) and developed a considerable interest both in education, nursing practice and leadership, and in improving the care provided in terms of patient satisfaction and well-being (Alsufyani et al., 2020). Based on the above definition, the concept of EI was introduced into nursing due to the impact of EI on the person, considered as an individual and on social aspects (Goleman, 1995; Alsufyani et al., 2020). From a purely nursing perspective, EI can be considered as: "the nurse's

constructive ability to demonstrate and facilitate self-awareness, self-management, social awareness, and social relationship management” (Parsa-Yekta & Abdolrahimi, 2015 – p. 159). In their concept analysis, Parsa-Yekta and Abdolrahimi (2015) identified two additional attributes of EI in nursing: ‘internal locus of control’ and ‘limited mental borders’. In this way, four domains of reference were identified: Self-awareness and self-management (individual traits) and social-awareness and social-management (social skills).

Self-awareness identifies the individual’s ability to understand one’s emotions in depth (Molero-Jurado et al., 2019; Alsufyani et al., 2020), manage them in the best way and achieve a specific purpose (Parsa-Yekta & Abdolrahimi, 2015; Alsufyani et al., 2020). Similarly, social-awareness is identified as the ability to clearly understand the feelings of others (Molero-Jurado et al., 2019; Raghubir, 2018; Alsufyani et al., 2020) and build relationships of mutual trust, and social relationship management (Raghubir, 2018). Other studies identify Goleman’s theory as the most innovative one (Alsufyani et al., 2020) and which best lends itself to the nursing context (Raghubir, 2018) as it defines EI as a competence interconnected with social relations (Goleman, 1995). Raghubir (2018) highlights, using the methodology of Beth Rodgers (Rodgers, 1989), how the concepts of “emotional competence” and “emotional efficacy” are surrogate terms for EI and, therefore, used interchangeably in the nursing literature. Furthermore, Alsufyani et al. (2020) highlight how EI is identified through four main inherent concepts interconnected with nursing: emotionality, sociability, well-being, and self-control. Having good emotional competencies, therefore, enables nurses to develop important professional skills not only from a healthcare point of view (Molero-Jurado et al., 2019; Raghubir, 2018), but also in terms of leadership, management (Zhu et al., 2015), education and research (Parsa-Yekta & Abdolrahimi, 2015). From a healthcare perspective, having the skills to identify and manage one’s own emotions and those of others ensures high quality care and increases the perceived wellbeing of patients and their families (Raghubir, 2018; 2018; Alsufyani et al., 2020). Self-management and self-awareness are essential concepts in nursing to maintain high levels of wellbeing in the care setting (Nel et al., 2013; Alsufyani et al., 2020). By identifying and managing their emotions, nurses can manage stress better, reduce burnout and job dissatisfaction (Nel et al., 2013; Raghubir, 2018), and even avoid conflicts between peers and/or their superiors (Akerjordet & Severinsson, 2007).

Nurses with emotional competencies, as well as reflecting on the event and outcomes, through a phase called ‘reflexivity’ (Goleman, 1995; Raghubir, 2018), recognise the emotions that play or have played a key role in gaining complete information about a situation and how this knowledge is applied (Ingram, 2013).

Reflection and reflexivity are essential components of problem-solving and critical thinking skills, which nurses learn and develop during their studies (Raghubir, 2018). In fact, emotionally intelligent nurses who can better elaborate, through reflection and reflexivity, on what happened are less likely to develop job dissatisfaction, stress and burnout (Nel et al., 2013; Alsufyani et al., 2020). During their undergraduate programme, nurses are educated to interpret, evaluate, and reason, not only in the theoretical context but also in practice, and draw information also from their own thoughts and expectations (Benner et al., 2015). Reflection and reflexivity are traits already considered in nursing curricula through the development of critical thinking and problem-solving (Por et al., 2011). However, it is important that students are also educated on the possible emotional involvement related to the situations they will face in practice (Benner et al., 2015). This aspect is fundamental not only from the personal emotional point of view of the student and future nurse, but also to improve the healthcare of patients and their families (Benner et al., 2015). Por et al. (2011) demonstrated that nursing students with higher levels of EI had greater levels of well-being and competency, as well as better problem-solving and social support skills. Educating students in EI means preparing nurses with emotional competencies capable of managing their own and others’ emotions by improving interpersonal and communication skills (Orak et al., 2016) and reducing the onset of work-related stress and intention to leave (Por et al., 2011; Orak et al., 2016; Carvalho et al., 2018).

Introducing self-awareness activities in nursing curricula, through specific skills and exercises, could allow students to learn how to recognize and manage their emotions (Carvalho et al., 2018). In traditional and formal classes, relational and emotional practices used to be missing (Benner et al., 2015) but today these can be effectively taught through the use of scenarios that involve role-playing or by watching videos of real situations (Carvalho et al., 2018).

The emotional component must become a cornerstone of nursing education, as nurses must learn how to manage their own and others’ emotions to cope with difficult life experiences, such as suffering, death, anger and fear (Benner et al., 2015). Many studies and reviews focus on the outcomes resulting from the implementation of educational courses based on EI, but, according to the best of our knowledge, there are no

systematic reviews that explore which learning strategies can be adopted to effectively integrate EI in nursing undergraduate students.

1.2 Review Aim

We aim to disclose the effectiveness of the learning strategies and evaluation tools to implement the best pedagogical strategies to develop EI in undergraduate nursing students.

1.3 Review questions

Based on the purpose of the study, this review will try to answer the following questions:

1.3.1 Primary question

What learning strategies are currently adopted for the development of EI in undergraduate nursing students' curricula?

1.3.2 Secondary questions:

- What evaluation tools are used to evaluate EI effectiveness?
- What is the impact of EI implementation on stress and burnout?
- What is the impact of EI implementation on intention to leave?
- What is the impact of EI implementation on problem solving skills?

2. Methods and analysis

2.1 Study design

The present systematic review protocol was developed according to the Joanna Briggs Institute (JBI) guidelines for systematic reviews of effectiveness (Aromataris & Munn, 2020; Tufanaru et al., 2020), and was registered in PROSPERO under registration number CRD42022362308. This protocol was developed in October 2022. We started data analysis in January 2023 and completed the review at the end of April 2023. In the review, the transparency of the selection process of the studies will be based on the PRISMA statement for systematic reviews (Liberati et al., 2009; Moher et al., 2009) and on the GRADE approach for the reporting of the strength of evidence, including the summary table (Tufanaru et al., 2020; Schunemann et al. 2013). To build the research question for this systematic review, we will use the PICO framework (Schardt et al., 2007) as required by the JBI guidelines (Aromataris & Munn, 2020): Population (type of participants), Intervention (types of interventions), and Outcomes. The control (C) is not required for this study.

2.2 Inclusion criteria

Population (Type of participants)

The review will include all studies involving undergraduate nursing students in any institutional learning environment (theory class, clinical practice, laboratory, internship), at any level, period, or year of the course, and in any continent. Studies that compare undergraduate nursing students with nurses or other professionals, or students from other courses, will be included if they present data separately. Studies that evaluate activities carried out during the undergraduate course and address issues related to the nursing education (workshops, events, courses, and other activities foreseen as curricular) may be included.

Intervention (types of interventions)

Educational programmes to develop EI in nursing curricula will be included in the review. The most interesting specific results will be studies including learning strategies. Studies based on the evaluation of the educational programmes will be included in the review. Any isolated, compared, or combined learning strategies used to develop EI or emotional competencies in any curricular teaching activity and in any theme of nurse education (included but not limited to Problem Based Learning, simulation, concept map, case study, Team-Based Learning, reflective writing) will be included in the study. Studies recommending

effective educational strategies in the development of EI or emotional competence will also be included. We will consider any individual and/or group educational strategies used in undergraduate nursing students to develop EI or emotional competencies.

Outcomes (dependent variable)

All studies involving the teaching of EI to nursing students will be included. The concept analyses of Parsa-Yekta & Abdolrahimi (2015), Raghubir (2018) and Alsufyani et al. (2020), all agree with the definition of EI in nursing as “the nurse’s constructive ability to demonstrate and facilitate self-awareness, self-management, social awareness, and social relationship management” (Parsa-Yekta & Abdolrahimi, 2015 – p. 159). The definition of EI in nursing takes inspiration from the Goleman’s EI framework because it is the most innovative and relevant one to the nursing social context. In fact, Goleman defined EI as the capacity to recognise our own feelings and those of others, for monitoring ourselves, and managing emotions in ourselves and in our social relationships (Goleman, 1995). The principal aspects of EI are emotionality, sociability, wellbeing, and self-control, and its attributes are self-awareness, self-management, social-awareness, and social-management.

Another important concept of EI is empathy. To evaluate if a person is emotionally intelligent, it is important to evaluate his/her emotional competencies/emotional efficacy. In the literature, these two variables are considered synonyms of EI, and are used interchangeably (Raghubir, 2018). The review will include studies that report EI outcomes on burnout, stress, or emotional exhaustion [Described as a syndrome involving emotional exhaustion and cynicism (White et al., 2019)], intention to leave [Described as turnover, or intention to leave the nursing course, the hospital setting, the organisation or the profession (Lindqvist et al., 2015)] and problem-solving skills [Defined as an important skill for the nursing student in planning and delivering effective patient care, enhanced team effectiveness, and overall satisfaction in learning (Kim & Kim, 2021)]. Studies where instruments or scales are used to assess the development of EI or emotional competence, will also be included.

2.3 Type of studies

To obtain a complete systematic review, the types of studies to be included will be randomized controlled trials (RCTs), observational studies (such as prospective and retrospective cohort studies), case-control studies, and cross-sectional analytical studies. Qualitative studies such as, but not limited to, phenomenological studies, ethnographic studies, and Grounded Theory studies, are to be considered. Therefore, this will be a mixed methods systematic review using the Joanna Briggs Institute (JBI) methodology. Since randomized controlled trials on this topic are very few, researchers consider appropriate to include a wider range of study designs for this review. However, only primary studies will be included in the review.

2.4 Search strategies

2.4.1 Electronic Searches

Based on the research question, seven databases will be searched: MEDLINE, The Cochrane Library, SCOPUS, CINAHL, EMBASE, PsycINFO and ERIC. Since no similar systematic reviews are present in the literature, no time limits will be set. Language restrictions will be applied by including only studies in English and Italian. The search terms will be identified based on the conceptual analysis conducted by Parsa-Yekta and Abdolrahimi (2015), Alsufyani et al. (2020) and Raghubir (2018) and further searches conducted in the literature. Initially, the search strategy will be as comprehensive as possible to include the largest number of studies and then will be gradually reduced based on the inclusion and exclusion criteria. Specific search strategies will be adopted for each database.

2.4.2 Search through other sources

The review will consider published studies by commercial and academic publishers, as well as non-commercially published studies (grey literature). For this purpose, OpenGrey and Google Scholar will be consulted. If completed and unpublished studies exist, RCT study registries included in the WHO international clinical study registries platform will be consulted (International Clinical Trials Registry Platform (ICTRP)) and the ISRCTN registry. If systematic or scoping reviews are retrieved on a similar topic, each paper included in the reviews will be analysed. The reference list of all studies included in our review will be analysed to eventually identify additional relevant studies.

2.4.3 The search terms

The terms will include synonyms or specific expressions according to the database (Table 1). The terms will be combined as MESH and TEXT WORDS in MEDLINE, as Thesaurus terms in PsycINFO, as natural language in Cochrane Library, CINAHL, SCOPUS, Embase, ERIC, OpenGrey and Google Scholar. The selection of studies involves two phases: initial screening of titles, abstracts, and keywords according to inclusion and exclusion criteria to identify relevant documents and exclude irrelevant ones. Before the first phase, an evaluation of duplicate publications or multiple reports of the same study will be conducted through EndNote version 20 by an external researcher. The papers will be selected by four independent reviewers ("YES" included, "NO" not included "U" unable to determine, in this case, the full texts will be read). Studies will be excluded even if only one criterion is not met.

Table 1. Search concepts and keywords used (with appropriate Boolean operators).

Database	Population: Nursing student	Exposure: Pedagogical strategies	Outcome: • Emotional Intelligence • burnout (stress, emotional exhaustion...); • intention to leave (turn over, intention to leave the hospital setting, the organisation, or the profession); • problem-solving skills
CINAHL and APA PsycInfo	("nursing students" OR "student nurses" OR "undergraduate student nurses") OR ("undergraduate students" OR "college students" OR "university students")	("teaching methods" OR "teaching approaches" OR "teaching strategies" OR "instruction") OR ("problem based learning" OR "pbl" OR "problem-based learning") OR ("simulation training" OR "simulation education" OR "simulation learning") OR ("learning strategies" OR "learning styles" OR "learning methods") OR ("role play" OR "role-play" OR "roleplay") OR "role play in nursing education" OR "role playing in education"	("emotional intelligence" OR "emotional competence" OR "emotional awareness" OR "emotional literacy") OR ("burnout" OR "burn-out" OR "burn out") OR ("intention to leave" OR "turnover intention" OR "leaving intention") OR ("job satisfaction" OR "work satisfaction") OR "problem solving skills"

Database	Population: Nursing student	Exposure: Pedagogical strategies	Outcome: - Emotional Intelligence - burnout (stress, emotional exhaustion...); - intention to leave (turn over, intention to leave the hospital setting, the organisation, or the profession); - problem-solving skills
		OR “cooperative learning strategies” OR “reflective practice in education”	
Medline, Pubmed	((“Students, Nursing”[Mesh])) OR ((“nursing students”[Title/Abstract] OR “student nurses”[Title/Abstract] OR “undergraduate student nurses”[Title/Abstract]) OR (“undergraduate students”[Title/Abstract] OR “college students”[Title/Abstract] OR “university students”[Title/Abstract] “university students”))	((“teaching” [Mesh] OR “Problem-Based Learning” [Mesh] OR “Problem Solving” [Mesh] OR “Role Playing” [Mesh] OR “education” [Mesh])) OR ((“teaching methods”[Title/Abstract] OR “teaching approaches”[Title/Abstract] OR “teaching strategies”[Title/Abstract] OR “instruction” [Title/Abstract]) OR (“problem based learning”[Title/Abstract] OR “pbl”[Title/Abstract] OR “problem-based learning” [Title/Abstract]) OR (“simulation training”[Title/Abstract] OR “simulation education”[Title/Abstract] OR “simulation learning”[Title/Abstract]) OR (“learning strategies”[Title/Abstract] OR “learning styles”[Title/Abstract] OR “learning methods”[Title/Abstract]) OR (“role play”[Title/Abstract] OR “role-play”[Title/Abstract] OR “roleplay”[Title/Abstract]) OR “cooperative learning strategies”[Title/Abstract] OR “reflective practice”[Title/Abstract])	((“Emotional Intelligence”[Mesh] OR “Self-Control” [Mesh] OR “Emotional Regulation” [Mesh] OR “Social Behavior” [Mesh] OR “Social Skills” [Mesh] OR “Empathy”[Mesh] OR “Burnout, Psychological” [Mesh] OR “Burnout, Professional”[Mesh] OR “Stress, Psychological” [Mesh] OR “Job Satisfaction” [Mesh])) OR ((“emotional intelligence”[Title/Abstract] OR “emotional competence”[Title/Abstract] OR “emotional awareness”[Title/Abstract] OR “emotional literacy”[Title/Abstract]) OR (burnout[Title/Abstract] OR “burn-out”[Title/Abstract] OR “burn out” [Title/Abstract]) OR (“intention to leave”[Title/Abstract] OR “turnover intention”[Title/Abstract] OR “leaving intention”[Title/Abstract]) OR (“ job satisfaction”[Title/Abstract] OR “work satisfaction”[Title/Abstract]) OR “problem solving skills”[Title/Abstract])

Database	Population: Nursing student	Exposure: Pedagogical strategies	Outcome: - Emotional Intelligence - burnout (stress, emotional exhaustion...); - intention to leave (turn over, intention to leave the hospital setting, the organisation, or the profession); - problem-solving skills
Cochrane	"Students, Nursing" OR ("nursing students" OR "student nurses" OR "undergraduate student nurses") OR ("undergraduate students" OR "college students" OR "university students")) in Title Abstract Keyword	((("teaching" OR "Problem-Based Learning" OR "Problem Solving" OR "Role Playing" OR "education")) OR (("teaching methods" OR "teaching approaches" OR "teaching strategies" OR "instruction") OR ("problem based learning" OR "pbl" OR "problem-based learning") OR ("simulation training" OR "simulation education" OR "simulation learning") OR ("learning strategies" OR "learning styles" OR "learning methods") OR ("role play" OR "role-play" OR "roleplay") OR "cooperative learning strategies" OR "reflective practice")) in Title Abstract Keyword	((("Emotional Intelligence" OR "Self-Control" OR "Emotional Regulation" OR "Social Behavior" OR "Social Skills" OR "Empathy" OR "Burnout, Psychological" OR "Burnout, Professional" OR "Stress, Psychological" OR "Job Satisfaction")) OR (("emotional intelligence" OR "emotional competence" OR "emotional awareness" OR "emotional literacy") OR (burnout OR "burn-out" OR "burn out") OR ("intention to leave" OR "turnover intention" OR "leaving intention") OR ("job satisfaction" OR "work satisfaction") OR "problem solving skills")) in Title Abstract Keyword
concepts (keywords):	"nursing student*" "nurse student*" "student nurse" "undergraduate nursing student*"	Lesson* Class* Instruction* Lecture* Modelling Observation "Problem Based Learning" "Team-Based Learning" "Problem solving" "Socratic discussion*" "Socratic dialogue*" Seminar* Simulation* "Role play" "case stud*" "concept map*" "Collaborative learning" "Cooperative learning" "Brain storming" Project* "reflective writing" "learning strateg*" "teaching strateg*" "learning method*"	"emotional competenc*" "Social Emotional competenc*" "Social-emotional competenc*" "Emotional intelligence competenc*" "emotional intelligence*" "EI" "Intelligence, Emotional" "Emotionality" "Sociability" "Wellbeing" "Emotional Wellbeing" "Psychological wellbeing" "Work Wellbeing" "self-control" "Self Control" "Control, Self" "Self-Regulation" "Self Regulation" "Regulation, Self" "self-awareness" "self-management" "social awareness" "Social behaviour" "Social abilit*"

Database	Population: Nursing student	Exposure: Pedagogical strategies	Outcome: • Emotional Intelligence • burnout (stress, emotional exhaustion...); • intention to leave (turn over, intention to leave the hospital setting, the organisation, or the profession); • problem-solving skills
		"teaching method*" "educational programme*" education tutoring coaching training	"social management" "Social interaction" "Social skill*" "Empathy" "Interpersonal Skill*" "Skills, Interpersonal" "Social Competenc*" "Competence, Social" "Burnout" "Burnout, professional" "Perceived stress" "emotional exhaustion" "intention to leave" "turn over" "problem-solving" "Job satisfaction*" "Satisfaction, Job" "Satisfactions, Job" "Work Satisfaction*" "Satisfaction, Work"

The full texts of the articles classified as relevant or appropriate to our review will be read and analysed, as well as those that cannot be evaluated by reading only the abstract, according to the inclusion and exclusion criteria identified.

An external researcher experienced in systematic reviews will provide independent quality control of the selection process and oversee the entire review and analysis process. In both phases, the documents will be examined separately by two researchers according to the defined criteria. In case of disagreement between the two researchers, a third researcher will be involved. If the information regarding the study is not present, or the full text is not available, the author will be contacted and in case of no reply after 2 weeks the article will be excluded from the review. If there are studies replicating other studies or part of them, their data will be considered as belonging to a single study. The reasons for the exclusion of the full texts will be recorded.

2.4.4 Methodological quality assessment

To establish the internal validity and risk of bias of the studies that meet the review inclusion criteria, tools developed and made available by JBI will be used to assess the quality of studies appropriate for conducting a systematic review on effectiveness (Aromataris & Munn, 2020; Tufanaru et al., 2020).

The critical appraisal will be conducted by two reviewers independently. The reviewers will meet to discuss the results of their critical appraisal for their final evaluation. If the two reviewers disagree on the final critical evaluation and disagreement is not resolved through discussion, a third reviewer assessment may be required. The critical evaluation tools that will be used for the different study designs are:

- JBI Critical Appraisal Checklist for Cohort Studies
- JBI Critical Appraisal Checklist for Case-Control Studies
- JBI Critical Appraisal Checklist for Case Series
- JBI Critical Appraisal Checklist for Case Reports
- JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies
- JBI Critical Appraisal Checklist for Qualitative Research
- JBI Critical Appraisal Checklist for Randomized Controlled Trials
- JBI Critical Appraisal Checklist for Quasi-Experimental Studies (non-randomized experimental studies)
- JBI Critical Appraisal Checklist for Prevalence Studies

The quality scores of each study will be recorded. In the event a meta-analysis or a meta-synthesis is conducted, it will be performed on homogeneous quality levels.

2.5 Data extraction

A data extraction sheet has been designed to extract relevant data from the papers that will be included in the review, according to guidelines provided by the Institute of Medicine (US) Committee on Standards for Systematic Reviews of Comparative Effectiveness Research (IOM, 2011).

The following data will be collected: study design/methodology, purpose/objectives, research questions/hypotheses, study context (setting), sample description, sample size, intervention, tools for measuring results, results (EI, burnout, intention to leave and problem-solving skills), methods of data analysis (statistical analysis), conclusions, comments and issues raised, and quality assessment.

The data will be extracted separately by two researchers, using the data extraction sheet. The extraction sheet will be tested to assess if the collected data is appropriate to answer the review questions. Any disagreement between the two researchers will be solved by a third researcher.

2.6 Data synthesis and analysis

To combine the results of several primary studies into a single overall summary estimate, a meta-analysis and/or a meta-synthesis will be performed if possible (many studies, homogeneous, high quality). Where data cannot be statistically combined, a narrative synthesis will be generated regarding the effectiveness of the educational strategies used to develop EI in undergraduate nursing students.

The narrative synthesis will be based on the use of words and text to summarize and explain the results of the synthesis process. Its form may vary from a simple account to the description of the characteristics of the study, the context, the quality, and the results. To emphasize the characteristics of the studies and the extracted data and allow comparisons, tables, graphs, and other diagrams will be used (Hannes & Lockwood, 2012). The synthesis of all the results will be reported using the GRADE approach for the reporting of strength of evidence, including a table with a summary of the findings (Tufanaru et al., 2020; Schunemann et al. 2013). All data will be stored in a shared folder protected by a password. Only the researchers involved in the review will know the password and have access to the folder.

2.6.1 Meta-analysis

Studies reporting a statistically significant result ($P < 0.05$) are more likely to be published or published earlier than studies not showing a statistically significant result ($P > 0.05$) (Fagerland, 2015). To minimise the impact of publication bias, we will include trial registries and unpublished studies or grey literature. Furthermore, although funnel plot methods could be affected by low power, numerous alternative

explanations for the asymmetrical distribution of studies, and inaccurate researcher interpretations of plots, they remain a valuable and popular way of investigating publication bias. For these reasons, we convened to adopt both strategies to minimize meta-bias. Publication bias will be assessed through the graphical representation of the size of the traced evidence compared to the effect size reported by the studies (funnel plot) (Harbord et al., 2006). The estimates of the outcomes and the confidence intervals of the individual studies and any meta-analyses will be made through graphical representation with a forest plot (Lewis & Clarke, 2001). Following JBI guidelines, we will assume that the distribution of effects has a non-identical effect size, and that the meta-analysis summary effect size is an estimate of the mean distribution of the true effect (Borenstein et al 2010). The effect sizes include risk ratios, risk differences, odds ratios, weighted mean differences, and standardized mean differences. All the analysis will be performed using the Jamovi software version 2.3.23.

When quantitative data cannot be statistically combined, the narrative summary will present quantitative data extracted from individual studies and, if available, accurate estimates (a value representing the best estimate of effects) and interval estimates (an estimated range of effects, presented as a 95% confidence interval). Small studies are assumed to be more likely to be susceptible to publication bias than large ones and are therefore not published.

2.6.2 Meta-synthesis

A meta-aggregative approach to synthesise qualitative evidence will be used (Aromataris & Munn, 2020). Meta aggregation is sensitive to the nature and traditions of qualitative research while being predicated on the process of systematic review (Pearson, 2004). The meta-aggregative approach is sensitive to the practicality and usability of the primary author's findings and does not seek to re-interpret those findings as some other methods of qualitative synthesis do. A strong feature of the meta-aggregative approach is that it seeks to enable generalizable statements in the form of recommendations to guide practitioners and policymakers (Hannes & Lockwood, 2011). The meta-aggregative approach will start with the extraction of all findings from all included qualitative papers. We will establish a level of credibility for each finding based on JBI guidelines (JBI Critical Appraisal Checklist for Qualitative Research) (Aromataris & Munn, 2020). We will code and aggregate each finding of the studies. By assembling and categorizing the findings based on similarity in meaning, we will generate new categories. The new categories will be created by a consensus process between the reviewers. The aim will be to summarise all illustrative data, themes, definitions, and memos of qualitative studies to capture similarities and differences within the data as accurately as possible (Aromataris & Munn, 2020). When findings cannot be combined or when findings are not supported, they will be reported separately in a narrative summary.

2.7 Protocol registration:

This protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO) database (registration number CRD 42022362308).

3. Implication and relevance

We envisage that this systematic review will provide an overview of educational and training methods, pedagogical strategies and evaluation tools that enable to effectively teach Emotional Intelligence in nursing under- and postgraduate programmes and develop students' emotional competencies. In addition, it will be possible to identify the pedagogical importance of EI in nursing, both for pre-registration education, and post-registration continuing professional development courses. Overall, the review will expand the evidence base related to the development of emotional competencies in nursing.

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References

- Akerjordet, K., & Severinsson, E. (2007). Emotional intelligence: a review of the literature with specific focus on empirical and epistemological perspectives. *Journal of clinical nursing*, 16(8), 1405–1416. <https://doi.org/10.1111/j.1365-2702.2006.01749.x>
- Alsufyani, A. M., Baker, O. G., & Alsufyani, Y. M. (2020). Consequences of Emotional Intelligence in Nursing: A Concept Analysis. *Erbil Journal of Nursing and Midwifery*, 3(1), 82–90. <https://doi.org/10.15218/ejnm.2020.10>
- Aromataris E, Munn Z (Editors). JBI Manual for Evidence Synthesis. JBI, 2020. Available from <https://synthesismanual.jbi.global>. <https://doi.org/10.46658/JBIMES-20-01>
- Benner P., Sutphen M., Leonard L., Day L. (2015). *Formazione infermieristica: strategie per una trasformazione radicale*. Edra editore.
- Carragher, J., & Gormley, K. (2017). Leadership and emotional intelligence in nursing and midwifery education and practice: a discussion paper. *Journal of advanced nursing*, 73(1), 85–96. <https://doi.org/10.1111/jan.13141>
- Carvalho, V. S., Guerrero, E., & Chambel, M. J. (2018). Emotional intelligence and health students' well-being: A two-wave study with students of medicine, physiotherapy and nursing. *Nurse education today*, 63, 35–42. <https://doi.org/10.1016/j.nedt.2018.01.010>
- Fagerland MW. Evidence-Based Medicine and Systematic Reviews. In: *Research in Medical and Biological Sciences: From Planning and Preparation to Grant Application and Publication*. 2015.
- Goleman D. *Working with Emotional intelligence*. New York: Bantam; 1998.
- Hannes K, Lockwood C. (2012). Synthesizing Qualitative Research: Choosing the Right Approach. *Synthesizing Qualitative Research: Choosing the Right Approach*, 113-159. <https://doi.org/10.1002/9781119959847>
- Hannes, K., & Lockwood, C. (2011). Pragmatism as the philosophical foundation for the Joanna Briggs meta-aggregative approach to qualitative evidence synthesis. *Journal of advanced nursing*, 67(7), 1632–1642. <https://doi.org/10.1111/j.1365-2648.2011.05636.x>
- Harbord, R. M., Egger, M., & Sterne, J. A. (2006). A modified test for small-study effects in meta-analyses of controlled trials with binary endpoints. *Statistics in medicine*, 25(20), 3443–3457. <https://doi.org/10.1002/sim.2380>
- Ingram, R. (2013). Locating Emotional Intelligence at the Heart of Social Work Practice. *The British Journal of Social Work*, 43(5), 987–1004. <https://doi.org/10.1093/bjsw/bcs029>

- IOM - Institute of Medicine (US) Committee on Standards for Systematic Reviews of Comparative Effectiveness Research, Eden, J., Levit, L., Berg, A., & Morton, S. (Eds.). (2011). *Finding What Works in Health Care: Standards for Systematic Reviews*. National Academies Press (US).
- Kim, M. E., & Kim, J. Y. (2021). The impact of a team-based learning group readiness assurance test on nursing students' problem solving, learning satisfaction, and team efficacy: A crossover study. *Nurse education today*, 100, 104819. <https://doi.org/10.1016/j.nedt.2021.104819>
- Lewis, S., & Clarke, M. (2001). Forest plots: trying to see the wood and the trees. *BMJ (Clinical research ed.)*, 322(7300), 1479–1480. <https://doi.org/10.1136/bmj.322.7300.1479>
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ (Clinical research ed.)*, 339, b2700. <https://doi.org/10.1136/bmj.b2700>
- Lindqvist, R., Smeds Alenius, L., Griffiths, P., Runesdotter, S., & Tishelman, C. (2015). Structural characteristics of hospitals and nurse-reported care quality, work environment, burnout and leaving intentions. *Journal of nursing management*, 23(2), 263–274. <https://doi.org/10.1111/jonm.12123>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ (Clinical research ed.)*, 339, b2535. <https://doi.org/10.1136/bmj.b2535>
- Molero Jurado, M., Pérez-Fuentes, M., Oropesa Ruiz, N. F., Simón Márquez, M., & Gázquez Linares, J. J. (2019). Self-Efficacy and Emotional Intelligence as Predictors of Perceived Stress in Nursing Professionals. *Medicina (Kaunas, Lithuania)*, 55(6), 237. <https://doi.org/10.3390/medicina55060237>
- Nel, J. A., Jonker, C. S., & Rabie T. (2013). Emotional Intelligence and Wellness Among Employees Working in the Nursing Environment. *Journal of Psychology in Africa*, 23:2, 195-203
DOI: [10.1080/14330237.2013.10820615](https://doi.org/10.1080/14330237.2013.10820615)
- Orak, R. J., Farahani, M. A., Kelishami, F. G., Seyedfatemi, N., Banihashemi, S., & Havaei, F. (2016). Investigating the effect of emotional intelligence education on baccalaureate nursing students' emotional intelligence scores. *Nurse education in practice*, 20, 64–69. <https://doi.org/10.1016/j.nepr.2016.05.007>
- Parsa-Yekta Z., & Abdolrahimi M. (2015). Concept analysis of emotional intelligence in nursing. *Nurs Pract Today*, 2(4): 158-163.
- Pearson A. (2004) Balancing the evidence: incorporating the synthesis of qualitative data into systematic reviews 2004. *JBIR Reports*, 2: 45-64.
- Por, J., Barriball, L., Fitzpatrick, J., & Roberts, J. (2011). Emotional intelligence: its relationship to stress, coping, well-being and professional performance in nursing students. *Nurse education today*, 31(8), 855–860. <https://doi.org/10.1016/j.nedt.2010.12.023>
- Raghubir A. E. (2018). Emotional intelligence in professional nursing practice: A concept review using Rodgers's evolutionary analysis approach. *International journal of nursing sciences*, 5(2), 126–130. <https://doi.org/10.1016/j.ijnss.2018.03.004>
- Rodgers, B. L. (1989). Concepts, analysis and the development of nursing knowledge: the evolutionary cycle. *Journal of advanced nursing*, 14(4), 330-335. <https://doi.org/10.1111/j.1365-2648.1989.tb03420.x>

- Schardt, C., Adams, M. B., Owens, T., Keitz, S., & Fontelo, P. (2007). Utilization of the PICO framework to improve searching PubMed for clinical questions. *BMC Medical Informatics and Decision Making*, 7, 16. doi: <http://dx.doi.org/10.1186/1472-6947-7-1>
- Schünemann H, Broek J, Guyatt G, Oxman A (editors). GRADE Handbook. Handbook for grading the quality of evidence and the strength of recommendations using the GRADE approach. Updated October 2013.
- Tufanaru C, Munn Z, Aromataris E, Campbell J, Hopp L. Chapter 3: Systematic reviews of effectiveness. In: Aromataris E, Munn Z (Editors). JBI Manual for Evidence Synthesis. JBI, 2020. Available from <https://synthesismanual.jbi.global>. <https://doi.org/10.46658/JBIMES-20-04>
- White, E. M., Aiken, L. H., & McHugh, M. D. (2019). Registered Nurse Burnout, Job Dissatisfaction, and Missed Care in Nursing Homes. *Journal of the American Geriatrics Society*, 67(10), 2065–2071. <https://doi.org/10.1111/jgs.16051>
- Zhu, Y., Liu, C., Guo, B., Zhao, L., & Lou, F. (2015). The impact of emotional intelligence on work engagement of registered nurses: the mediating role of organisational justice. *Journal of clinical nursing*, 24(15-16), 2115–2124. <https://doi.org/10.1111/jocn.12807>