



# Virtual Gamification in Mental Health Nursing Education: Protocol for a Scoping Review

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## About this protocol:

- *The protocol of a scoping review according to the methodology of the Joanna Briggs Institute (JBI) is described.*
- *The protocol was recorded and time-stamped before the start of the research.*

## ABSTRACT

### **BACKGROUND:**

The global activation of precautionary measures to protect public health has certainly reinforced the interest of teachers in virtual simulation methodologies. In this educational framework, Serious Games seem to allow for better accessibility, including the possibility of being enjoyed or repeated a hypothetically unlimited number of times without necessarily being limited by the presence of lecturers, the availability of laboratories, the available equipment and the possible commitments of the learners themselves, contributing to the learning experience by improving the motivation, commitment to cognitive training and self-confidence of nursing students. The fields of application of virtual gamification (defined as the integration of virtual game features in non-game contexts) seem to be varied, however, some particular fields, such as the Mental Health setting, seem to have promising results in studies with still heterogeneous design and objectives, showing the need to expand the available evidence.

### **METHODS AND ANALYSIS:**

A scoping review will be performed according to the methodology of the Joanna Briggs Institute. The biomedical databases consulted will be MEDLINE (PubMed), Scopus, WebOfScience, Cochrane Library, Cinhal and Embase; extension of the grey literature search will be performed by consulting Google Scholar, ClinicalTrials.gov, TRIP (Turn Research Into Practice), medRxiv, OSF Preprints, Open Access Theses and Dissertations. Articles in Italian or English language available in full text format will be included. The presentation of study information will be done either through dedicated tables and in narrative form.

**KEYWORDS:** *Gamification, Serious Game, Virtual Simulation, Nurses, Mental Health*

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JOURNAL HOMEPAGE: [HTTPS://RIVISTE.UNIMI.IT/INDEX.PHP/DISSERTATIONNURSING](https://riviste.unimi.it/index.php/dissertationnursing)**BACKGROUND:**

The global triggering of precautionary measures for the protection of public health has certainly strengthened the interest of teachers in virtual simulation methodologies: literature evidence reports how these can be an effective strategy to increase the engagement and involvement of students (1) with positive effects at a cognitive level and interesting consequences also on the psychomotor domain, contributing to the teaching of clinical skills (2,3), with similar or superior effects if compared to traditional simulation methods (4,5).

In comparison to the classical benefits of clinical simulation, virtual simulation of Serious Games allows better accessibility, including the opportunity to be enjoyed or repeated a hypothetically unlimited number of times without necessarily being locked to the presence of trainers, to the availability of laboratories, to the available equipment and to the eventual commitments of the learners themselves, contributing to the learning experience by improving motivation, commitment in the context of cognitive training (6) and the self-confidence of nursing students (7). The limitations of this particular type of simulation lie precisely in its virtual nature, which could reduce its impact on psychomotor domain if used standalone; however, as suggested by a recent systematic review by Woon (8), virtual simulation strategies could complement current pedagogical strategies to address the challenges associated with the diminishing opportunities for clinical training; these virtual gaming strategies combined with clinical simulation could become part of the suite of best teaching and learning practices that can be offered to students (9).

The fields of application of virtual gamification (defined as the integration of game characteristics in non-game contexts (10)) seem to be rather diverse; however, some particular fields started to show some interest, among which, that of Mental Health (11,12) where promising outcomes are found in studies with still heterogeneous structuring and objectives, showing the need to expand the available evidence.

A preliminary search of the MEDLINE (PubMed) database was therefore carried out in April 2022 in search of scoping reviews or systematic reviews on the subject, finding only one Cochrane review from 2007 (13) that considered a single RCT carried out on a sample of nursing students.

Following the current research priorities declared by the INACSL (International Nursing Association for Clinical Simulation And Learning), it seems appropriate to perform a structured research work to define the state of the art in the use of virtual gamification and serious games in nursing education with respect to the specific settings of mental health nursing.

**RESEARCH QUESTION:**

What approaches have been studied in the use of virtual gamification/serious games in nursing education aimed at the mental health context?

**Sub-questions**

- What type of tool has been used? In what ways?
- Which validation methodologies were used?
- Which outcomes were studied?
- Was the subjective experience of the students evaluated?

**INCLUSION CRITERIA:****Concept**

The concept of interest of the scoping review is the use of the virtual gamification and serious games in the training of nursing students in the specific field of mental health nursing.

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## Sample Characteristics

Nursing students of any grade and level. Present information on the degree of schooling will be collected in order to differentiate the application areas.

## Context

No geographical restrictions will be applied to the research; data concerning the context of development (academic, associative, corporate, etc.) and the context of use (curricular, non-curricular university courses, student's choice courses, refresher courses, etc.) will be extracted and collected.

## Types of evidence sources

This scoping review will consider primary literature studies (of any type) in "full text" format and in Italian or English language carried out between 2012 and 2022.

1	"Nurses"[Mesh] OR "Nursing"[Mesh] OR "Education, Nursing"[Mesh] OR nurs*
2	"Education"[Mesh] OR "Schools, Nursing"[Mesh] OR "Universities"[Mesh] OR "Academies and Institutes"[Mesh] OR education OR learning OR university OR training OR "Nursing Education" OR "Nursing Learning"
3	"Video Games"[Mesh] OR "Virtual Reality"[Mesh] OR "Computer Simulation"[Mesh] OR "virtual simulation" OR "video gam*" OR "virtual reality" OR "virtual hospital" OR "gamification" OR "serious game*" OR "Gaming"
4	"Mental Health"[Mesh] OR "psychology"[Mesh] OR "psychiatry"[Mesh] OR "mental health" OR "psychology" OR "community health" OR "psychologic" OR "psychiatric"
5	#1 AND #2 AND #3 AND #4
	Limitation to Italian and English Language; Limitation to years: from 2012 to 2022.

Table 1: Initial search strategy for Pubmed

## SEARCH STRATEGY:

To carry out the search, the methodology described in the JBI Manual for Evidence Synthesis (14) will be used, dividing the search into three stages, diagrammatically summarised in Image 2. The selection of the papers found will be carried out independently by two researchers; in the event of discrepancies, a third researcher will make the relevant decisions. For the management of the search results, Endnote software will be used. In addition, a pilot test will be carried out in which the selectors will analyse a random sample of 25 articles according to the defined selection and eligibility criteria; any discrepancies will be discussed in order to assess possible changes to the already defined criteria. The search will only start when a concordance of 75% or more of the analysed studies is reached.

### Step 1 - definition of search terms:

During the first phase, an initial search of the biomedical databases Pubmed and Scopus will be carried out. Table 1 shows the initial search criteria that will be used on Pubmed.

As recommended by McGowan (15), this search strategy will initially be shared with a university librarian from the University of Milan; following modifications to this strategy and their documentation, the actual search will take place. The article selection process will be carried out by analysing each title and abstract individually.

Following selection process, an analysis of the terms contained in the title, abstract and keywords will be carried out using the statistical software R and some packages (including dplyr, tidytext and ggplot2); the analysis of the words will be presented through a Wordcloud (example in Image 1) and/or frequency graphs. The words identified as most 'characterising' the concepts underlying the research will then be extracted.

### Step 2 - main search

Following the first phase, the main search will be carried out, i.e. the terms extracted in the previous phase will be used for a full-text search on the databases

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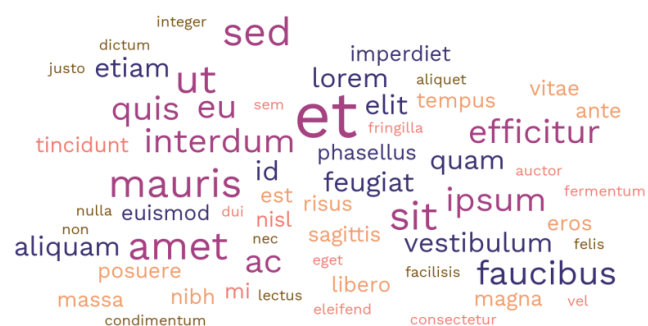
MEDLINE (PubMed), Scopus, WebOfScience, Cochrane Library, Cinhal, Embase. Articles will be selected after reading the title and abstract while eligibility will be determined after reading the full text. Exclusion reasons for not included articles be given in a specific appendix.

- Context of development and use of the instrument;
- Type of instrument used;
- Validation methodology used;
- Outcomes studied;
- Evaluation of the student experience.

The table in Appendix 1 shows an example of data presentation. Before data filling, two researchers will carry out data extraction on at least three studies in order to assess any additional categories of important data to be included.

## EVIDENCE ANALYSIS:

Once the main data have been catalogued, an analytical description of the sample of studies and a descriptive analysis of the evidence found will be carried out with a focus on the specific topics of the field covered, the development methodologies and related reference frameworks, validation methodologies and costs (if reported). The experiences and satisfaction of the learners (if reported) will also be described and analysed.



*Image 1: wordcloud example*

## Step 3: gray literature search

References of the selected articles will then be analysed to assess the possible inclusion of further work. As a final step of the review, the grey literature will be screened by performing a content search through Google Scholar, ClinicalTrials.gov, TRIP (Turn Research Into Practice), medRxiv, OSF Preprints, Networked Digital Library of Theses and Dissertations, Open Access Theses and Dissertations.

## DATA COLLECTION:

Data will be collected systematically as outlined in the JBI Manual for Evidence Synthesis and presented in electronic tables. The extracted and reported data will include:

- Author name;
- Year of publication;
- Type of study conducted;
- Location where the study was conducted;

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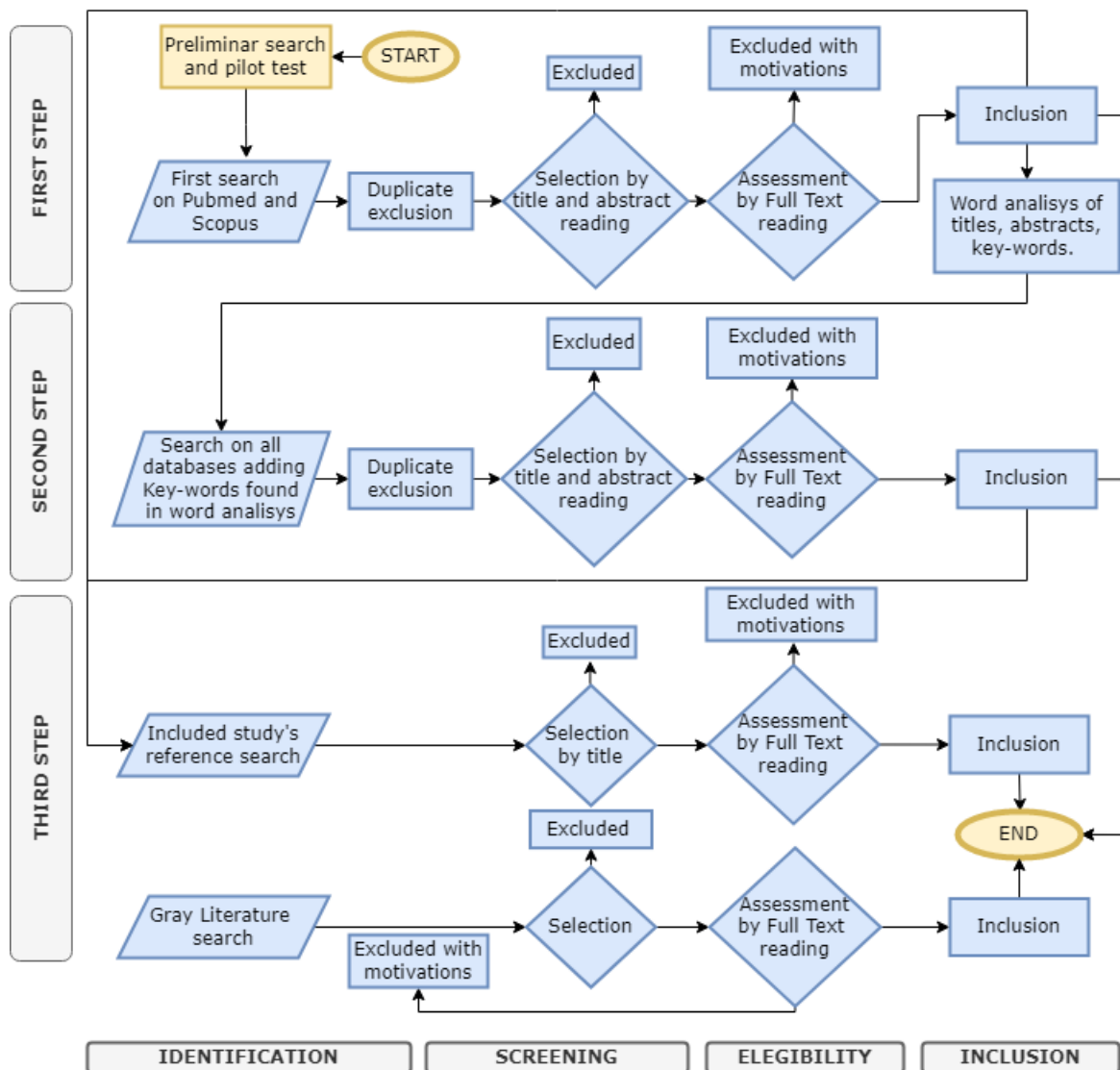
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Image 2: diagrammatic search summary

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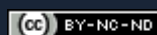
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## APPENDIX 1: data presentation

#	References	Study type	Framework	Context		Lerners		Tool	Validation methodology	Considered Outcomes	Lerners experience
				Developing <i>(University, Association, Company, private, etc)</i>	Use <i>(curricular courses, extracurricular, updating course, etc)</i>	Students	Nurses				
#1	<i>Example, 2020</i>	<i>Quasi Experimental study</i>	<i>Framework by Richards &amp; Buldrón</i>	<i>University of Milan</i>	<i>extracurricular courses</i>	X		<i>Video Based serious game</i>	<i>Some notion about validation process</i>	<i>Knowledge, retention after 2 months, ...</i>	<i>Yes</i>
#2	<i>Example, 2021</i>	...	...	...	...		X	...	...	...	...

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