



## Review

## Clinical case in digital technology for nursing students' learning: An integrative review



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## ARTICLE INFO

## Article history:

Accepted 1 December 2015

## Keywords:

Nursing education

Case studies

Computer-assisted instruction

Nursing Student

## SUMMARY

**Objectives:** This review aimed to analyze the available evidences in literature about clinical case studies inserted in digital technologies for nursing education, characterizing the technology resources and cognitive, procedural and attitudinal learnings.

**Design:** Integrative review of literature with the following steps: development of the research problem, data collection, data extraction and critic evaluation, data analysis and interpretation and presentation of results. The research question was: how does the clinical case study inserted in educational digital technology collaborate for cognitive, attitudinal and procedural learning of nursing students? Data sources: data bases LILACS, PUBMED, CINAHL and Scopus. Review methods: the search resulted in 437 studies: 136 from LILACS, 122 from PUBMED, 104 from Scopus and 75 from CINAHL. Of these, 143 did not meet the including criteria, 93 were duplicated and four studies were unavailable. After analyzing all abstracts based on inclusion and exclusion criteria, there were selected 197 studies and after full text analysis the final sample resulted in 21 primary studies.

**Results:** Case study use in educational digital technologies allowed the students to build different types of learning: cognitive learning (n = 16 studies), attitudinal learning (n = 12 studies) and procedural learning (n = 8 studies).

**Conclusion:** It is possible to conclude that case studies can collaborate with the students to develop different learnings which can be built integrate, continuous, informative and formative, aiming integral formation and aligned to policies of formation in nursing, both national and international.

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## Introduction

Pedagogic models focusing on expositive and non-interactive classes can lead to students' demotivation and consequently can harm learning. Teaching institutions and faculties should perceive the student as an active person capable of determining own learning and should stimulate experimentation, critical thinking and participative strategies (Fonseca et al., 2009; Lessmann et al., 2012; Anastasiou and Alves, 2012; Lunney, 2010).

From our experience in nursing education, the most popular teaching strategies are expositive lectures, text readings, guided practice and debates. In this study we are interested in clinical case study which is widely used in undergraduate nursing courses, such as Brazil (Ferreira et al., 2012), United States (Wilson et al., 2014), Korea (Park, 2013), Taiwan (Hsu, 2011) and Australia (Rogers, 2011).

Case studies are based on real situations which stimulate students to investigate and analyze (Anastasiou and Alves, 2012). They encourage the interaction between faculty and students; teachers can assume the role of a mediator to help students and stimulate autonomy (Anastasiou and Alves, 2012; Graham, 2010).

Case studies can also instigate students to reflect critically about patients' context and to develop a nursing care of quality that gathers features such as individualized and humanized approach as well as technical and scientific support (Almeida and Souza, 2005).

Regarding nursing education there are many advantages of clinical case studies: approach guided by questions and not by answers (Duarte and Ellensohn, 2007; Graham, 2010), motivation to active participation in the educational process (Abraham et al., 2008; Bosque, 2012; Duarte and Ellensohn, 2007; Graham, 2010; Risner, 1990), interest of students in solving problems (Abraham et al., 2008; Bosque, 2012; Risner, 1990), relationships between theory and practice (Cates and Armentrout, 2013; Bocchi et al., 1996; Cates, 2011; Duarte and Ellensohn, 2007; Lunney, 2010; Risner, 1990), critical thinking (Abraham et al., 2008; Bosque, 2012; Cates and Armentrout, 2013; Cates, 2011; Duarte and Ellensohn, 2007; Graham, 2010; Lunney, 2010; Risner, 1990; Zimmerman and Pilcher, 2008) and reflection and

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learning through experience and argumentation (Graham, 2010; Zimmerman and Pilcher, 2008).

The clinical case study also helps students to establish priorities (Cates and Armentrout, 2013; Cates, 2011). It supports the development of competences related to cognition, communication, procedures and teamwork skills (Abraham et al., 2008; Arafeh, 2011; Cates, 2011).

In nursing process, the use of case studies by students or nurses can help to enhance cognitive skills because the cases provide concrete examples of the principles of diagnosis reasoning. It facilitates the standardization of nursing diagnosis and interventions and the allocation of scientific value to the practice grounded on clinical reality (Lunney, 2010; Lunney, 2008).

Case studies can stimulate nursing students to learn different types of contents: cognitive, attitudinal and procedural. Cognitive learning refers to abstract terms and principles. Procedural learning includes technical rules, methods, skills, strategies and procedures. Attitudinal learning involves many contents classified in attitudes, moral values and rules (Zabala, 1998).

Considering the scientific advances it is also necessary to incorporate the use of technology in education aiming to strengthen a more flexible, creative and interactive learning (Cheng and Cheng, 2009; Cogo et al., 2010; Fonseca et al., 2014, 2015; Freitas et al., 2012).

Digital technologies can improve the comprehension of theoretical fundamentals of contents and the articulation between theory and practice (Arafeh, 2011; Frota et al., 2013; Gallo, 2011; Holanda et al., 2013), minimize anxiety of students (Frota et al., 2013; Gallo, 2011; Holanda et al., 2013), enhance comprehension of previously studied subjects (Arafeh, 2011; Frota et al., 2013) and respect the pace of learning (Fonseca et al., 2009; Holanda et al., 2013).

So, this review aimed to analyze the available evidences in literature about clinical case studies inserted in digital technologies for nursing education, characterizing the technology resources and cognitive, procedural and attitudinal learnings.

## Methods

Literature review process needs elaboration of a summary based on different topics capable of creating a wide comprehension on the subject matter. Reviews are important to the scientific knowledge building because they allow the emergence of new theories, identification of lacks and rise opportunities to support research (Botelho et al., 2011). This design was chosen because it enables the synthesis and analysis of scientific knowledge available about a specific theme (Whittemore and Knaff, 2005).

### Research Problem

The PICOT strategy – *Patient population/disease, Intervention or issue of interest, Comparison intervention or issue of interest, Outcome* – was addressed in this research, *Time* (Melnyk and Fineout-Overholt, 2011) and the correspondent elements follow: Population: nursing students; Intervention: clinical case study; Issue of interest: digital technology in education; Outcome: cognitive, procedural and attitudinal learning.

The research question was: How does clinical case study inserted in a digital educational technology collaborate to cognitive, procedural and attitudinal learning of nursing students?

### Search Strategy

The search was performed in databases using only descriptors (PUBMED), only keywords (Scopus) or the combination of them (LILACS and CINAHL). In LILACS database the terms were written in Portuguese, English and Spanish, whereas in the other databases the terms were in English, exclusively.

Data collection was performed between July 2014 and January 2015, considering that the searches in databases occurred between December 8 and December 15, 2014.

The search was divided into three categories: technologies, nursing education and clinical case studies. The keywords and descriptors pertaining to the same category were separated by OR and among them by AND. The terms used during the search were categorized by database:

LILACS (descriptors and keywords): “education, nursing”, “students, nursing”, “educational technology”, “computer-assisted instruction”, and “computer simulation”; PUBMED (descriptors): “computer-assisted instruction”, “computer simulation”, “case study”, “case studies”, and “health case”; CINAHL (descriptors and keywords): “education, nursing”, “students, nursing”, “nursing care studies”, “educational technology”, “computer-assisted instruction”, “computer simulation”, “computer”, “case studies”, “case study”, “clinical case”, and “health case”; Scopus (keywords): “computer-assisted instruction”, “educational technology”, “computer simulation”, “computer”, “education, nursing”, “students, nursing”, “case studies”, “health case”, and “clinical case”.

The search performed in the databases resulted in 437 studies: 136 from LILACS, 122 from PUBMED, 104 from Scopus and 75 from CINAHL. See below the selection flow diagram of primary studies (Fig. 1):

### Data Analysis

To proceed with analysis of abstracts and full text when necessary, the inclusion criteria were: approach the theme: case studies in digital educational technologies; present learning outcomes of nursing students (cognition, procedures or attitudes); papers published in English, Spanish or Portuguese. The exclusion criteria were: other literature reviews, not primary studies and editorials and sample is not nursing students.

Data extraction occurred based on a data collection instrument developed and validated as part of this work, based on the instruments proposed by Ursi and Galvao (2006) and Romanzini (2013). The content of this instrument was: identification data, aim and type of research question, methodology, main outcomes, analysis of cognitive, procedural and attitudinal learning, use of technology resources, general features of the case study and conclusions.

Instrument validation occurred according to its appearance and content by six registered nurses with age between 27 and 65 years – five professors acting in nursing education and research field for more than 10 years, and one registered nurse doctoral student with history of intensive course training and experience on research methods.

Experts' recommendations resulted in inclusion of items to evidence greater wealth of information to achieve the research objectives and were considered as relevant by the researchers.

Two reviewers accomplished all stages of this study independently since search stage until the completion of the instrument described above. Divergent results were systematically discussed in meetings for alignment and final analysis of the work.

This integrative review considered as theoretical framework the epistemological approach based on psychology contributions by Antoni Zabala (1998).

## Results

### Study Characteristics

All 21 primary studies selected for analysis met the inclusions criteria and had been published in scientific journals between 2001 and 2014. Publications between the period 2011 and 2012 were predominant, with five papers in each year.

Regarding the origin of main authorship, they were from five different countries: United States (n = 9/42.9%), Brazil (n = 7/33.3%), Taiwan (n = 3/14.3%), Korea (n = 1/4.8%) and Australia (n = 1/4.8%). Among the 21 studies, English language prevailed (n = 15/71.4%).

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