Digital teaching and learning media for nursing and healthcare courses in Germany: a scoping review

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Abstract

Background: In Germany, the digital transformation and legal regulations are leading to the need of integrating digital technologies into the nursing profession. In addition, to nursing practice, they are also being incorporated into nursing training. However, there is no standardized framework for the use of digital teaching and learning media in nursing education.

Objective: The general aim of this study is to provide an overview of the use of digital teaching and learning formats in nursing and healthcare education in Germany.

Methods: The study is planned as a scoping review. The reporting of the study is based on the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) 2020 guidelines. The sources of information for the review include six bibliographic databases (MEDLINE via PubMed, Cochrane Library, Web of Science Core Collection, ERIC, PROSPERO and PsycINFO). The search results will be presented in accordance with the PRISMA 2020 guidelines. The eligibility of studies is based on the population, concept, and context criteria (PCC criteria): (1) learners of nursing and healthcare professions, (2) digital teaching and learning formats, (3) forms of implementation in Germany since 2007.

Results: The literature search is planned for June 2024. The selection of titles, the coding of the data and the data analysis are expected to be completed by August 2024.

Conclusions: In Germany, there is a growing drive to integrate digital teaching and learning formats into nursing and healthcare education. Our scoping review will provide an overview of applications of digital teaching and learning media in the education of nursing and healthcare professions in Germany. In this way, the scoping review provides relevant impulses for fields of application and design aspects of digital teaching and learning media for nursing and healthcare education in Germany. Clinical Trial: not applicable

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Keywords

digital education; digital learning; digital teaching; e-Learning; nursing; healthcare

Introduction

The idea of learning with machines is not new. Back in the 1920s, Sidney L. Pressey developed a machine that asked a question and offered four possible answers, like the multiple-choice method [1]. Nowadays, digital technologies are used to create and provide learning materials and to support and control the learning process [2]. In this context, the term “e-learning” describes all forms of learning with electronic or digital media [3]. The introduction of the iPhone in 2007 have been an international milestone in the development of e-learning [3, 4]. The mobile devices create the conditions for innovative pedagogical approaches such as flipped classroom[1] or blended learning[2] , by using modern technologies and various teaching methods to make learning more effective and personalized. In corresponding teaching and learning approaches, the time, place, pace, and scope of learning can be freely chosen [2], giving learners more autonomy and control over their individual learning process. That learners often own the appropriate technical equipment represents a major advantage of mobile devices [5]. The digitalization of nursing and healthcare education is considered to have particular potential due to the complexity of professional requirements and the constant further development of subject-specific knowledge [6, 7]. In addition to the relevance of digital teaching and learning formats in nursing and healthcare education, there is also a need in Germany to incorporate digitalization into healthcare professional education. This arises from legal regulations such as § 8 Abs. 8 SGB XI or the E-Health Act, which are intended to promote the digitalization of professional practice and require corresponding skills on the part of nursing professionals. The digitalization of healthcare professional practice is intended to improve the quality of care and effectively prepare professionals for highly complex care situations, which should ultimately lead to better care outcomes for patients [8-10]. In addition, the topic of digitalization can be found in the new legal foundations of the Act on the Nursing Professions (Pflegeberufegesetz, PflBG), the Training and Examination Regulations for the Nursing Professions (Ausbildungs- und Prüfungsverordnung für die Pflegeberufe, PflAPrV) and the framework curricula and

[1] Teaching method in which learning content is developed outside the classroom and applied in the classroom.
[2] Teaching method that combines different methods and media, for example from face-to-face teaching and e-learning.

framework training plans. These foundations list forms of digital support for various parts of the nursing process. In this regard there is a need to develop and integrate digital teaching and learning formats for nursing and healthcare education [6, 11], as well as suitable teaching and learning formats.

Objectives

In Germany, there are increasing efforts to integrate digital teaching and learning formats into nursing and healthcare education. This fact leads to the question, for which educational content and didactic concepts digital teaching and learning formats are used in nursing and healthcare education in Germany. Furthermore, which scientific findings are present about the use of digital teaching and learning formats in nursing and healthcare education in Germany? Thus, our main objectives are: 1) Digital teaching and learning formats and 2) forms of implementation in the context of learners in the nursing and healthcare professions.

Methods

Study Design

We conduct a scoping review [12, 13] in consideration of published primary sources and reviews. We operationalize the research question by using the PCC scheme [14] (see Table 1).

Table 1: PCC scheme to identify the key concepts of the scoping review
Source: Own illustration

PCC Element	Definition
Population	Learners in the nursing and healthcare professions
Concept	Digital teaching and learning formats
Context	Forms of implementation in Germany since 2007

Study reporting is based on the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) 2020 guidelines [15] because guidelines for overviews are not available at the time of this writing. The PRISMA 2020 checklist will be made available once the overview is complete.

Patient and Public Involvement

Patients and public are not involved in the design of this protocol. Thus, ethics approval is not required for the scoping review.

Eligibility Criteria

The eligibility of studies is based on the population, concept, and context criteria (PCC criteria): (1) learners of nursing and healthcare professions, (2) digital teaching and learning formats, (3) forms of implementation in Germany since 2007. The scoping review aims to provide an overview of the use of digital teaching and learning formats in nursing and healthcare education in Germany. The electronic search is conducted in German and English. Only titles, which are published since 2007 will be included.

Information Sources

The information sources for the scoping review will include six bibliographic databases (MEDLINE, Cochrane Library, Web of Science Core Collection, ERIC, PROSPERO and PsycINFO). The starting point will be the search in MEDLINE via PubMed as the central database for scientific studies in the health professions. The PubMed search supports the generation of suitable mesh terms for the research question and is adapted to the databases Cochrane Library, Web of Science Core Collection, ERIC (Institute of Education Science), PROSPERO and PsycINFO [16]. The Cochrane Library provides access to up-to-date and reliable research, which is further complemented by the PROSPERO database as a repository of systematic reviews. ERIC covers the educational discourse on the question and Web of Science Core Collection bundles the vocational education and health care focal points of the question in a database. These focal points are further supplemented and completed by research via PsycINFO, which contains peer-reviewed journals, articles, books and dissertations on learning and teaching methods in health care, including nursing didactics.

Search Strategy

The electronic search strategy will be developed iteratively by the team. The search was based on the PRISMA statement [17] (see Figure 1). The search terms and corresponding Medical Subject Headings terms will be derived to address the two main search topics of the scoping review: 1) Digital teaching and learning formats and 2) forms of implementation in the context of learners in the nursing and healthcare professions. The electronic search is conducted in German and English and includes titles that were published since 2007.

((Please insert Figure 1 here.)

Selection of Sources of Evidence

Two researchers will search in mentioned databases independently of each other using the search strings and will check all studies for relevance and suitability. After screening, we will compare the search results. Any contradictions or inconsistencies in the study assessment will be clarified through discussion. Studies that met the inclusion criteria will be used for the full-text evaluation. This will also be carried out by two researchers. If necessary, we will contact the authors to obtain further information. The study selection will be concluded with a consensus meeting. Afterwards the data for each included study will be extracted by using a self-developed form in Excel. The results of the literature search will be reported in full once the scoping review is complete. A list of included and excluded studies following full-text screening and individual reasons for exclusion will be reported once the overview is complete.

Critical Appraisal of Individual Sources of Evidence

not applicable

Overlap in Primary Studies Included in Systematic Reviews

not applicable

Data Charting

We will develop an Excel form for coding and recording all data. Two authors code all data independently of each other. The agreement between the codings is calculated using Cohen's Kappa. If necessary, authors will be contacted to obtain further information. A consensus meeting is supposed to conclude the study selection.

Synthesis of Results

We plan to use qualitative content analysis to form categories in an inductive-deductive alternation [18]. In inductive category formation, categories are derived directly from the material [19]. Deductive category formation defines the categories before the data analysis [19] and refers to the used PCC scheme. The coded data will be synthesized using descriptive statistics (relative frequencies).

Subgroup Analyses

not applicable

Results

The literature search is scheduled for June 2024. We expect to select the relevant systematic reviews, code the data, and appraise the systematic reviews until August 2024.

Discussion

Principal Findings

Digital education enables context-independent and needs-based learning, which is intended to make learning easier and more effective. For this purpose, digital teaching and learning can be delivered through a variety of technologies, enabling a wide range of intervention options [20]. This scoping review will provide an overview of such technologies and interventions once the studies have been selected. In addition to application, we will also highlight areas where digital teaching and learning formats are used in nursing and healthcare education in Germany.

Comparison to Prior Work

not applicable

Strengths and Limitations

This protocol has been rigorously developed and the electronic search syntax was iteratively tested and revised by the authors. Scoping reviews like this study contain potential biases in the selection of criteria, the search methodology and the data analysis. Just German and English-language publications in selected databases will be included. The inclusion of other languages, databases and additional search terms could lead to an increase of literature sources. Especially regarding to the background of the heterogeneous study situation, the methodology of the scoping review is relevant to gain a broad perspective of the use of digital teaching and learning media in nursing and health education in Germany. Nevertheless, the possibility of inaccuracies in a combined interpretation exists.

Implications for Practice and Dissemination Plan

In Germany there is an increasing effort to integrate digital teaching and learning formats into nursing healthcare education. This scoping review provides an overview in which way and in relation to which subject areas digital teaching and learning media are used in nursing and healthcare education. Findings from the scoping review could be of interest to various stakeholders, including educational institutions, researchers, health professionals, policy makers and companies developing digital teaching and learning media. Therefore, the results of the review should be published in a peer-reviewed journal.

Conclusions

Our scoping review provides an overview about the areas of application of digital teaching and learning methods in nursing and health education. In addition to the topic areas, the technical implementation methods and the didactic design should also be shown. The findings could be used to establish and expand digital teaching and learning methods in nursing and health professional educational institutions especially in Germany.

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Data Availability

This scoping review will be based on previously published data. All relevant data will be made available once the review is complete.

Conflicts of Interest

The authors declare no competing interests.

Abbreviations

ERIC: Education Resources Information Center
JMIR: Journal of Medical Internet Research
PCC: population, concept, and context
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PROSPERO: International Prospective Registry of Systematic Reviews

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Supplementary Files

Figures

PRISMA 2020 flow diagram Source: Own illustration, Adapted from: Page et al. [15] Note. n: number, EC: exclusion criteria, EC 1: Lack of reference to nursing and healthcare education, EC 2: no reference to digital teaching and learning formats, EC 3: no reference to the research question.