



# Strategies for sustaining and enhancing nursing students' engagement in academic and clinical settings: a narrative review

Mohammad Reza Ghasemi<sup>1</sup>, Hossein Karimi Moonaghi<sup>1,2</sup> and Abbas Heydari<sup>1</sup>

<sup>1</sup>Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Mashhad University of Medical Sciences, and <sup>2</sup>Department of Medical Education, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Students' engagement in academic-related learning activities is one of the important determinants of students' success. Identifying the best teaching strategies to sustain and promote nursing students' engagement in academic and clinical settings has always been a challenge for nurse educators. Hence, it is essential to provide a set of strategies for maintaining and enhancing the academic engagement of nursing students. The purpose of this review was to explore and summarize the strategies that nurse educators use to sustain and promote nursing students' engagement in academic and clinical settings. A narrative literature review was conducted. CINAHL (nursing content), ProQuest, Medline, the Cochrane, Google Scholar, and Scopus were searched. Of 1,185 retrieved articles, 32 teaching strategies were identified and extracted from the nursing literature. We used thematic analysis approach to organize these strategies into five main categories as follows: technology-based strategies (15 articles), collaborative strategies (10 articles), simulation-based strategies (two articles), research-based strategies (two articles), and miscellaneous learning strategies (three articles). As a general comment, these strategies have the potential to promote nursing students' engagement. Among the strategies discussed in this review, the use of technology, particularly the response system and online learning, was more common among nursing educators, which is in line with today's advances in smart technologies. The collection presented in this review can be used as a starting point for future research to evaluate the effectiveness of an educational intervention on the academic engagement of nursing students. Nevertheless, due to the lack of experimental studies, the optimal strategies remain to be elucidated through future high-quality experimental study.

**Key Words:** Nursing schools, Nursing students, Education, Teaching, Academic success, Engagement

## Introduction

One of the essential requirements of healthcare systems to meet the broad needs of patients is the employment of well-qualified nurses [1]. In this respect, one of the important responsibilities of nursing

education systems is providing high-quality education to nursing students and preparing competent nurses so that they can provide patients with safe and high-quality care in the future [2-4]. As a step toward that end, nursing educators need to use new educational strategies to actively engage nursing students in learning activities in academic and clinical settings [5,6]. Previous studies

Received: February 27, 2020 • Revised: April 10, 2020 • Accepted: May 6, 2020  
Corresponding Author: Hossein Karimi Moonaghi (<https://orcid.org/0000-0003-0496-2306>)  
Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran; Department of Medical Education, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad 9137913199, Iran  
Tel: +98.5138591511 Fax: +98.5138597313 email: KarimiH@mums.ac.ir

Korean J Med Educ 2020 Jun; 32(2): 103-117.  
<https://doi.org/10.3946/kjme.2020.159>  
eISSN: 2005-7288

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have shown that increasing academic engagement of students could increase their desirable academic performance and success [7]. Recent evidence indicates that engagement in academic-related learning activities is one of the important determinants of students' success in university [8-10]. As a result, identifying the best teaching strategies to sustain and promote nursing students' engagement in academic and clinical settings has always been a challenge for nursing educators. Hence, it is essential to provide a set of strategies for maintaining and enhancing the academic engagement of nursing students.

In educational literature, the concepts of academic engagement, student engagement (SE), educational engagement, student involvement, and school engagement have often been used interchangeably [11]. In this study, the term 'SE' was used. The concept of SE has been extensively studied in educational literature as an important determinant of quality in academic education. Several definitions of this concept have been proposed; however, one of the most widespread definitions of SE is provided by the prolific author, Kuh [12]. Kuh [12] defined SE as "the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities." However, several authors argue that this concept is more than student involvement in school-related activities. It is rather a multidimensional concept, whose dimensions include behavioral, emotional, cognitive, and motivational [11, 13,14]. SE, also, refers to the quality of the effort that learners spend on the targeted educational activities such as attending classrooms, studying, doing practical work, and engaging with professors or other students to reach the desired outcomes [15]. In the most recent definition of SE proposed by Kahu [13], the amount of time students spend on learning-related activities is con-

sidered as one of the main components of SE. In clinical disciplines such as nursing, many educational activities are accomplished in clinical settings. Hence, it is expected that the concept of SE in nursing education includes at least two concepts of "academic engagement" and "clinical engagement [16]." However, a search of the literature revealed small number of studies regarding clinical engagement, and this concept has recently become an important issue in nursing students' education. In addition, most nursing researchers have not provided a unique definition for the concept of SE [11,16]. Recently, Bernard [14] using concept analysis, theoretically defined SE as "a dynamic process marked by a positive behavioral, cognitive, and affective state exhibited in the pursuit of deep learning." This definition included the previously discussed dimensions and focused on deep learning; however, this definition lacks practical and measurable characteristics of SE, particularly time spent to engage with educational activities. Given the lack of an operational definition of SE in nursing education, based on the literature, we used the following working definition for conducting the current review. SE is "the investment of time, effort, and other relevant resources by both students and their institutions intended to optimize the student experience and enhance the learning outcomes and development of students, and the performance and reputation of the institution [11]."

In the last decade, many nurse researchers have investigated various educational strategies to explore and develop the best ways to increase nursing students' academic engagement. The result of these efforts has led to the creation of new teaching strategies or modification of the techniques used by other disciplines. However, the lack of a study that reviews these strategies and techniques as a collection is felt. Previously, Crookes et al. [17] explored the strategies and techniques that nurse educators have employed to

help nursing students to contextualize theory learned in the classroom to their practice. However, most of those techniques borrowed from other disciplines. Therefore, the ultimate purpose of this review was to explore and summarize the strategies that nursing educators use to sustain and promote nursing students' engagement so that we can provide a set of these educational strategies to nursing educators and researchers. This review has been carried out as part of a nursing doctorate dissertation attempting to assess the lived experiences of nursing students on academic engagement activities.

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## Methods

The following question was used to guide this non-systematic narrative literature review: What strategies or techniques have nursing educators used to sustain and promote nursing students' academic or clinical engagement? To answer this question, we reviewed the literature to identify the most significant studies and theoretical foundations regarding the academic and clinical engagement strategies used by nursing educators.

### 1. Sources of information and search strategy

The following databases were searched for peer-reviewed scholarly articles: CINAHL (nursing content), ProQuest, Medline, the Cochrane, Google Scholar, and Scopus. Two authors (G.M.R. and K.M.H.) with the assistance of one librarian searched the databases using predefined search strategies. They individually screened the titles and abstracts of retrieved studies against the inclusion criteria for choosing relevant articles. We used several combinations of the following search terms 'engagement, nurse, student' and their related concepts by using the Boolean operator, "AND", to obtain any link

between them. The scope of the search was limited to English-language written international articles and publication dates were limited from January 2000 to June 2019. To find additional articles, we manually examined the reference sections of the retrieved studies and relevant review.

### 2. Selection criteria

To keep the focus directly on nursing students, the inclusion criteria for selecting articles were as follows: The sample should be nursing students and the used strategies must be done by nursing educators. As well, we included original articles, reviews, innovative papers, discussion papers, learning projects, and theoretical frameworks. We excluded the dissertations and articles related to the other professions. Duplicate articles were also excluded. Given that we intended to provide a comprehensive set of educational strategies for sustaining and promoting nursing students' engagement, we did not appraise the quality of included studies and did not remove any studies due to the low quality.

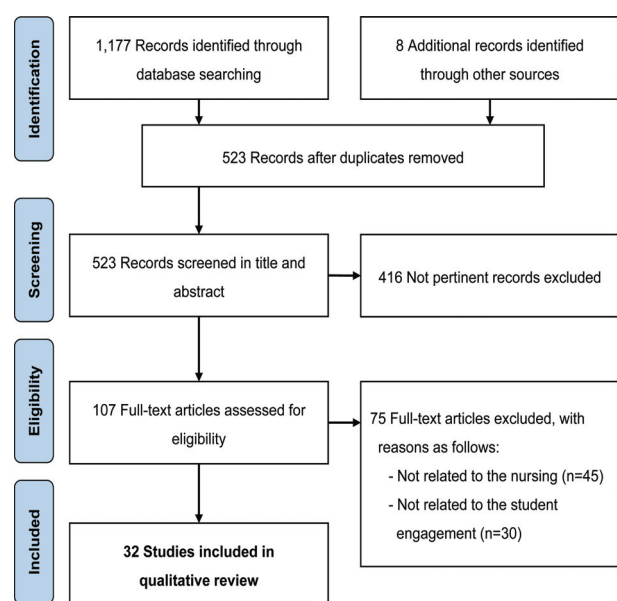
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## Results

Of 1,185 retrieved articles, 32 articles have met the selection criteria. Fig. 1 shows the process of study selection for inclusion in review.

Nursing researchers have explored and applied several strategies/techniques for sustaining and promoting nursing students' engagement. Given the heterogeneity of the educational methods, we used a thematic analysis approach to collate, summarize, and map the literature to identify themes across the retrieved studies based on the similarities of concepts and teaching techniques that educators had used. The second author reviewed each paper and data was coded to describe the main teaching

Fig. 1. PRISMA 2009 Flow Diagram for Study Selection



PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

methods. Similar codes were grouped together into categories to organize the main teaching strategies/techniques. New categories were developed or modified as analysis continued. At the end of analysis, we organized these strategies into five main categories as follows: technology-based strategies (15 articles), collaborative strategies (10 articles), active learning strategies (three articles), simulation-based strategies (two articles), and research-based strategies (two articles). It should be noted that there are some similarities between and within categories. Table 1 summarizes the students' engagement strategies. Regarding the methodology of retrieved studies, five were innovative, 10 were discussion paper, six were quasi-experimental, five were descriptive, and six were qualitative studies.

Table 1. Summary of Students' Engagement Strategies

Category	Author (year)	Paper type	Strategy/technique	
Technology based strategies				
Online	Barnes [20] (2017)	Innovative	Kahoot in the classroom	
	Broussard et al. [23] (2018)	Discussion	Online teaching	
	Daroszewski et al. [24] (2004)	Discussion	Online tiered discussion	
	Dickson [26] (2016)	Innovative	Asynchronous discussion boards	
	Johnston et al. [27] (2018)	Quasi-experimental	Posting videos on YouTube	
	Turner et al. [22] (2018)	Discussion	Online computer games	
	Giddens et al. [28] (2010)	Quasi-experimental	Virtual community	
	Shuster et al. [30] (2011)	Discussion	Virtual community	
	Offline	Fifer [33] (2012)	Quasi-experimental	Clickers
		Berry [32] (2009)	Quasi-experimental	Clickers
		Filer [35] (2010)	Quasi-experimental	Audience response system
		Moredich et al. [31] (2007)	Description	Classroom response system
		Mordhorst [34] (2010)	Description	Student response system
		Revell et al. [36] (2010)	Quasi-experimental	Personal response system
Aul et al. [37] (2018)		Qualitative	Barcode scanning	
Collaborative strategies				
Team-based	Dearnley et al. [40] (2018)	Discussion	Team-based learning	
	Oldland et al. [41] (2017)	Description	Team-based learning	
	Bramble et al. [42] (2018)	Qualitative	Interdisciplinary partnership	
	Burgess et al. [43] (2015)	Qualitative	Collaborative testing	
	D'Souza et al. [44] (2013)	Discussion	Faculty-student interaction	
	Raines [45] (2010)	Innovative	Crossword puzzles	
Service-based	Hart [46] (2015)	Discussion	Service-based learning	
	Taylor et al. [47] (2017)	Innovative	Service-based learning	
Peer-based	Casey et al. [49] (2011)	Qualitative	Peer assessment	
	Welsh [50] (2007)	Discussion	Peer assessment	

(Continued to the next page)

Table 1. (Continued)

Category	Author (year)	Paper type	Strategy/technique
Simulation based strategies	Power et al. [51] (2016)	Qualitative	Simulation with manikins
	Levett-Jones et al. [52] (2015)	Innovative	Tag team simulation
Research based strategies	Judge et al. [54] (2018)	Qualitative	Q methodology
	Hensel [53] (2016)	Discussion	Q methodology
Miscellanea learning strategies	Popkess et al. [9] (2011)	Descriptive	Active learning
	Waltz et al. [55] (2014)	Discussion	Active learning
	Salamonson et al. [56] (2009)	Descriptive	Homework completion

## 1. Technology-based strategies

There is growing evidence that shows the value of technology for engaging students in academic learning activities [18]. We found 15 articles discussing the importance of using online and offline technologies in promoting nursing students' engagement.

### 1) Online technologies

**a. Kahoot in the classroom:** Kahoot is a free web-based technology that incorporates a quizzing program to increase the participation of learners during the lecture. As well, it can be used as a mean for formative assessment of students. It is believed that the learners' attention is reduced in the first minutes after the beginning of the lecture and educators need to alter the situation and engage the learners to regain their attention [19]. The underlying assumption of Kahoot method is that an interesting program could increase students' participation during the lecture. Barnes [20] introduced this technique as an innovative tool for nurse educators for engaging students during the lecture. However, the effectiveness of Kahoot to increase the engagement of nurse students is under research and currently, there is no experimental research that examined the effectiveness of this method.

**b. Online teaching techniques:** Along with advances in technology and the Internet, many traditional teaching methods have been transformed into interactive web-based educational methods [21]. In recent years, web-

based courses provide many opportunities for actively engaging nursing students in learning activities [22–24]. Nursing education experts believe that online forum courses can bridge the gap between theory and practice in nursing discipline as well as it can facilitate the process of nursing students' engagement [17].

**c. Asynchronous discussion boards:** These boards enable multiple learners to engage in discussion with each other. All discussions of the learners are collected on a board and the members contribute their comments by responding to the initial discussion question or by responding to each other. It is believed that asynchronous discussion boards, by use of the Web and other Internet technologies, encourage deeper learning and help students to be more engaged in learning activities related to analysis, synthesis, decision-making, and the use of knowledge [25]. In nursing education, Dickson [26], proposed the basic structure of asynchronous discussion boards for enhancing the engagement of nurse students. The foundation of the technology is that educators can enhance students' engagement by posting a series of questions on the discussion board and then encourage those students to reflect and respond actively to those questions. At present, no experimental research has evaluated the effectiveness of this technology in terms of SE.

**d. Posting videos on YouTube:** Johnston et al. [27] incorporated a collection of YouTube videos into the bioscience course to support nursing students' en-

agement. The total number of views, comments, and subscriptions from students were collected directly from the Biological Sciences YouTube channel over four semesters. The videos are highly successful; with more than 300,000 views, 1.5 million minutes of viewing and more than 5,000 international subscribers during the study. More than 90% agreed that watching videos increased their engagement time in learning. Authors concluded that posting educational videos on YouTube can significantly engage students in learning activities and enrich the student experience and performance [27].

**e. Virtual Community:** Giddens et al. [28] designed and implemented an intervention called “the neighborhood virtual community (VC)” to assist first-semester baccalaureate nursing students (n=350 participants) in learning complex, health-related content. They described VC as an online teaching application presenting an imaginary community with multiple interconnecting character stories. VC included households' and health care nurses' characters. Students should follow the character stories each week during the semester by logging on to the Website. Using a two-group quasi-experimental study, they found that engagement in learning activities were significantly higher in the experimental group than those of the control group (analysis of variance,  $F=2.40$ ,  $p<0.05$ ). In addition, a significantly positive relationship ( $r=0.416$ ,  $p<0.001$ ) between the frequency of VC use and perceived benefits among students was found [29]. In another study, using VC in nursing education leading to the improvement of students learning through emotional connectedness to families and engagement of characters into learning activities [30].

## 2) Offline technologies

**a. Response systems (clickers):** Response systems are a set of software and hardware that educators have used to attract learners' attention and increase their engagement

during the class lecture. By asking questions in the classroom, the educator encourages the students to respond to these questions through a technology-based response pad called “clickers”. Using this system, students can get instant feedback from the educator regarding the asked questions. In this way, clickers actively engage students during the lecture. Recently, several nursing schools across the world used this technology [31–34]. Filer [35] in a pilot quasi-experimental study with 90 nursing students assessed the impact of an audience response system (clickers) on students' engagement and participation in the classroom. The control group responded verbally, while the intervention group responded anonymously using the clickers to questions posed during the lecture. The author found that students in the intervention group reported a greater level of motivation ( $p<0.001$ ); were more comfortable in the classroom ( $p=0.00$ ); and expressed a higher level of participation ( $p<0.001$ ) than students in the control group. In addition, almost all students indicated the clickers were easy to use and they would like to use it in future classes [35]. In another quasi-experimental study, Revell and McCurry [36] compared the effectiveness of a personal response system with didactic presentations. These interventions were incorporated within two undergraduate courses, nursing research (n=33) and junior medical-surgical nursing (n=116). The efficacy of each intervention was evaluated by multiple-choice, true-false, and quiz questions. Authors found that using a personal response system could significantly increase faculty-student participation and enhance active learning ( $p<0.001$ ) compared with the lecture [36]. In a study with 47 first-year nursing students, Fifer [33] evaluated the perceptions of first-year nursing students regarding the use of student response system technology. A 14-item Likert scale survey was used to collect students' perceptions. More

than 80% of the student had a positive perception regarding the strengths of this technology for increasing SE. Many students expressed that this method maintained their focus during the lecture [33]. Berry [32] incorporated clickers to enhance student interaction and learning in a didactic pediatric nursing course. Exam grades and level of participation were monitored and exam scores and final scores were compared between two groups of 'with clickers' (n=65) and 'without clickers' (n=61). Student t-tests demonstrated that one of the three-course exams and final course grades were significantly higher for the students who used clickers (mean±standard deviation, 93.33±1.99 versus 95.03±1.64; p<0.001). Satisfaction feedback also supported the use of clickers as a tool to engage students and enhance learning outcomes [32].

**b. Barcode scanning:** Quick response (QR) code is a specific two-dimensional code that are used to encode and decode information such as text, Uniform Resource Locator links, Short Message Service messages with a mobile device that is equipped with a camera and QR reader software. QR codes can be integrated with learning activities such as linking a specific topic to information on the Internet, reviewing information, or evaluating classroom assignments. As an interactive technology-based approach, many health care systems incorporate barcode scanning or QR codes into nursing students' clinical rotations to ensure patient safety. In addition, many educators incorporate this approach into the classroom activities to enhance students' engagement. In this regard, Aul and Johnston [37] explored the experiences of undergraduate nursing students during the oncology course. The authors created barcodes consisted of one review question using a web-based, QR code generator tool. The authors printed the barcodes on an index card and then the cards were strategically taped throughout the classroom and the hallways outside of the

classroom. Sixty-seven students were instructed to circulate around the room to scan the codes with their smartphones to find a range of oncology review questions. Afterward, the students should present and discuss the answer to the scanned questions. The authors found that barcode scanning is an attractive method for increasing SE and performance of nursing students. At present, the efficacy of barcode scanning to increase the engagement of nurse students is under research and currently, there is no experimental research that examined the effectiveness of this method.

## 2. Collaborative strategies

Collaborative learning is defined as a set of instructional methods to encourage students to work together to achieve a common learning goal. It involves mutual intellectual works by students themselves or students and educators. In this approach, students themselves are responsible for group governance and education output [38]. We found 10 articles discussing the importance of using collaborative strategies in promoting nursing students' engagement.

### 1) Team-based strategies

**a. Team-based learning:** Team-based learning (TBL) is a shared learning and teaching approach, which is frequently used by health sciences educators in their preclinical and clinical programs to foster self-directed learning [39]. In nursing education, Dearnley et al. [40] reviewed the outcomes of TBL in nursing education programs to explore the experiences of nursing students regarding the TBL. They discussed that there is a great body of evidence, which supports TBL, as collaborative teaching and learning strategy, for sustaining and enhancing students' engagement [40]. In an exploratory, descriptive study, Oldland et al. [41] explored the perceptions of nursing students regarding the role of TBL in shaping their professional clinical behaviors.

Authors found that TBL can maximize students' participation in the learning activities, develop active and deep learning, and raise teamwork performance, which in turn can enhance the students' engagement in both academic and clinical settings [41].

**b. Interdisciplinary partnership:** Many schools across the world have been implementing partnership projects between students and the school's staff in order to increase students' engagement in academic learning activities. Bramble et al. [42] implemented a participatory action research to develop a "3-month mentorship partnership intervention" between nursing students and a group of academics as a mentor. They found that interdisciplinary partnership could increase students' academic engagement and success; however, the acquisition of mutual trust and security were the main issues for developing mentorship capacity [42].

**c. Collaborative testing:** Quizzing has become a popular method of assessing learning and retention of knowledge as well as a mean of engaging students. In collaborative testing, students work together in small groups to complete quizzes before they select their final answer. Therefore, an important aspect of collaborative testing is the peer interaction, education, and collaboration during discussing each question. In nursing, Burgess and Medina-Smuck [43] used a collaborative testing approach using quizzes during maternal-infant course in the undergraduate nursing program. During this course, four multiple-choice quizzes were electronically administered. The outcomes were perception and attitude of students regarding collaborative testing strategy. Seventy-eight percent of students described this method as helpful and enjoyable in supporting their learning of the course material. Authors concluded that this strategy provided a structured method to enhance students learning and retention of course contents [43]. At present, no experimental research has evaluated the

effectiveness of this technology in terms of SE.

**d. Faculty-student interaction:** D'Souza et al. [44] highlighted and summarized the important roles of nursing educators to promote nursing students' engagement in the clinical environment. The suggested that to increase students' academic engagement, nursing educators should: (1) involve students in teaching strategies, (2) balance student's clinical activities with clinical assignments, (3) provide wide range of clinical activities, (4) appreciate the individual difference, (5) provide them with multidimensional resources, (6) group students for reflective activities, (7) create an atmosphere to enable students to learn, and (8) continuously supervise their activities. Authors found that when students and faculty actively share learning opportunities with each other, students are motivated to be more engaged in the new clinical learning environment.

**e. Crossword puzzles solving:** Raines [45] incorporated two models of crossword puzzles, as a cooperative learning activity, into nursing courses to promote students' engagement and their critical thinking. Students worked in two phases of individually and in a small group. In the first model, which was designed for simple courses, students should solve the clues and in the second one, they should construct the content for the crossword puzzle (advanced courses). This process forces the students to actively engage and share their thinking and reasoning process with each other. The author found that these methods can actively engage students, promote their decision-making process, and help them to solve the problems [45].

## 2) Service-based strategies

Service-based learning involves learning that takes place outside the classroom in a structured way between the learner and a service, and seeks to achieve common goals. It is a kind of partnership that bridges academic and community needs. This type of learning is mostly



done in the community, but it can also be used in clinical settings [46]. It is believed that service-based learning is one of the most effective strategies for students' engagement because it has the potential to positively engage learners into the real-life situations and encourage the learner to be an active learner [46,47]. In this regard, Hart [46] provided a three-step framework, called "ABCs of service-learning," that indicated the process of establishing and evaluating a service-learning project. The main components of this project are taken from the nursing process. In this project, A stands for "assessment and evaluation of community and educational needs," B stands for "be flexible and engaging," and C stands for "collaboration and celebration." The authors claimed that service-learning project has the distinctive potential for engaging students because it can capture the learners' attention, develop their partnerships and collaboration [46].

### 3) Peer-based strategies

Peer assessment (PA) refers to a process whereby students evaluate the learning or task performance of their peers and conversely, their learning are evaluated by their peers [48]. Although a few studies have focused on PA as a strategy for enhancing students' engagement in academic learning, some nursing authors agree that PA can actively engage nursing students in their learning activities by enhancing the confidence of students in judging about their own work/performance. In addition, PA can encourage them to reread their own assignment in light of their peers' feedback [49,50].

## 3. Simulation-based techniques

This category includes two strategies of "Simulation with Manikins and Tag" team simulation.

### 1) Simulation with manikins

Manikins have been long used in nursing education since they can provide safe and repeatable conditions for

practicing. In this regard, Power et al. [51] simulated five separate case studies during ten teaching weeks. They aimed to explore student perspectives (n=9) of the use of vignettes to increase engagement with manikins. Authors through thematic analysis and group discussion found that manikins are an effective procedure for increasing SE. Authors believed that if the appropriate educational scenario is selected in this learning method, the instructors will be able to actively engage nursing students in the learning process and to promote their decision-making skills [51].

### 2) Tag team simulation

The word "tag team" refers to a combination of two or more people who have formed a team to meet similar goals. The tag team is a small group, so the participation of the members in that team is maximal and active. In nursing programs, simulations are regularly led in large groups, with few students playing an active role and most observing. In contrast, tag team simulation (TTS) as an innovative educational strategy emphasizes the active engagement of both participants and observers in the simulation scenario. This method is inspired by the principles of theater and allows learners, as actors, to take responsibility for the actions and outcomes in a real context. Levett-Jones et al. [52] provided a TTS with pain scenario for 444 second-year nursing students. Satisfaction with Simulation Experience Scale was used to evaluate the active engagement and satisfaction of observers and participants. The mean satisfaction score was not different between participants and observers (4.63 versus 4.56,  $p=0.16$ ). This indicated that TTS is an effective approach for ensuring observers' and participants' active involvement during group-based simulations. Authors showed that TTS could promote the active engagement of learners and enhance their satisfaction with the simulation experience [52].

#### 4. Research-based strategies: Q methodology

Q methodology is a mixed-method approach for conducting research that focuses on individuals' preferences and subjective attitudes. Participants can express and share their viewpoints within the group [53]. In nursing, Judge et al. [54] incorporated Q methodology into a nursing education course about "substance abuse in school." The basis for using this method was that if students' attitudes and preferences are recognized and fulfilled, their participation and engagement in educational activities will be enhanced. The authors aimed to promote students' engagement and enhance their learning of evidence-based practice. Nursing students (n=35) participated in a 2.5-hour session to create a mock Q study on their opinions about substance abuse education. The outcome was the overall opinions of students regarding the characteristic of Q methodology and the class format. At the end of the study, most students expressed favorable opinions. Authors found that Q methodology can provide a means to extract the participants' opinion around a given topic and thus provide a way to keep students as active and engaged learners [54].

#### 5. Miscellaneous learning strategies

We found three articles discussing uncategorized learning strategies in promoting nursing students' engagement.

##### 1) Active learning

Undoubtedly, active learning is one of the key strategies for enhancing students' engagement within the nursing educational programs. Active learning is a student-centered approach in which requires students to participate and cooperate in the teaching and learning process [55]. Many of the discussed educational

strategies in the current review can be classified as an active learning strategy. In general, the available evidence about the effectiveness of active learning in nursing education shows that this cooperative educational strategy has a potential to promote nursing students' engagement in the academic and clinical learning activities [9,55]. In contrast, some studies have shown that in the absence of active learning, academic engagement is not created. Popkess and McDaniel [9] examined the relationship between pre-college students' inputs and academic engagement levels among baccalaureate students in nursing (n=1,000) and non-nursing professions (n=2,000). The National Survey of Student Engagement instrument was used to measure engagement on five subscales with a total of 41 items. Their findings showed that nursing students scored significantly higher (mean=58.71) on some aspects of academic engagement than other professions (mean=55.22 or 56.14). However, they were less engaged in active and collaborative learning than other majors [9].

##### 2) Homework completion

Although many studies have shown that homework, as an active learning approach, can increase the academic performance of students, this learning activities has received little attention in nursing education [56]. Salamonson et al. [56] described the relationship between academic engagement (homework completion, lecture attendance) and academic performance in nursing students (n=126) who were enrolled in a pathophysiology subject. Students spent about 6 hours per week studying. The mean percentages of lecture attendance and homework completion were 67.5% and 48.9%, respectively. Authors found that active learning activities such as homework completion are one of the best way to engage students. As well, it is a strong positive predictor of academic performance and success for nursing students [56].

## Discussion

Engaging nursing students in academic environments and clinical settings is a challenging issue for nursing educators, worldwide. In recent years, many nurse researchers have investigated various educational strategies to explore and develop the best ways to increase nursing students' academic engagement. Results of these efforts are the creation of new teaching strategies or modification of the techniques used by other disciplines. Accordingly, our main goal of this review study was to provide a set of useful tools for promoting nursing students' academic engagement. In this review, we summarized the teaching strategies that nursing educators used to sustain or enhance the academic and clinical engagement of nursing students and eventually, we highlighted the gap for further research. We organized the teaching strategies into five categories based on the similarities of concepts and teaching techniques that educators had used: the main categories were technology-based strategies, collaborative strategies, simulation based strategies, research based strategies, and miscellaneous learning strategies. Many of the training strategies had been created innovatively or derived from other disciplines such as management, technology, art, and theater. But the role of today technologies such as Internet in creating educational strategies was more prominent than the other [57]. Generally, in many of the strategies used, students' academic engagement increased, but the main problem was that the tools used to measure the degree of engagement were mostly self-reported or subjective. In other words, due to the lack of experimental educational studies in nursing regarding the SE (only 6 quasi-experimental studies), we could not judge the strengths and weaknesses of the extracted strategies. Therefore,

regarding the optimal strategy to sustain and promote nursing SE, further experimental study is needed. Moreover, given that the effectiveness of these techniques has been evaluated in the small number of studies, more experimental research is recommended.

Another important point is that educational strategies were mostly used in the classroom, and few were able to be transferred to clinical settings. Therefore, because more than half of nursing education takes place in clinical settings, the findings of these studies do not support the role of these strategies in increasing the academic engagement of nursing students in clinical education. In contrast, previous studies have shown that nursing students have greater motivation, both internally and externally, to learn clinical activities; therefore, they are more engaged in these activities [44,58]. However, there are limited studies on the clinical engagement of nursing students and there is a need for further research in this area. It is necessary that nursing instructors sustain and enhance the academic and clinical engagement of nursing students using innovative educational strategies in order to increase the level of students' knowledge and abilities and improve the quality of clinical services provided.

Based on the results of this review, among the strategies discussed in this review, the use of technology, particularly the response system and online learning, was more common among nursing educators, which is in line with today advances in smart technologies. Students of new technologies' era ('digital native' learners) are constantly engaged with the updated smart technologies [57]. In addition, online learning has witnessed a noticeable growth within healthcare education, nowadays [18,25,36,57]. Accordingly, if nursing educators want to maintain and enhance the students' academic and clinical engagement, they should equip themselves more with innovative technologically-driven learning techniques.

Active learning was the foundation of most educational strategies used to enhance students' academic engagement. In this regard, several studies in different fields of study have shown that any teaching method that can actively engage the student in learning process, can promote academic engagement and ultimately academic achievement of students [55,59]. Among the educational strategies reviewed in this study, strategies based on online technologies and simulation were more attractive to students and made their participation more active in the learning process. Accordingly, as a practical point of this study, if nursing teachers want to improve students' academic engagement, they need to use attractive teaching methods that are based on the latest technologies of today world, such as smartphones and online discussion systems; however, at present little is known about the methods of promoting academic engagement in clinical activities.

## 1. Limitations and strengths

Our main limitation was that the number of experimental studies that accurately assessed the effectiveness of a particular teaching strategy on students' engagement was limited. Some educators evaluated an innovative method in a limited group of nursing students without using a particular research plan and some others discussed the advantages and disadvantages of particular teaching strategies. These factors limited our conclusion about the effectiveness of a particular technique. Notwithstanding, the collection presented in this review can be used as a starting point for future research that to evaluate the effectiveness of an educational intervention on the academic engagement of nursing students. One of the strengths of our study is that we only considered the studies that were conducted in the field of nursing.

## 2. Conclusion and directions for future research

The main goal of this review study was to provide a set of useful tools for promoting nursing students' academic engagement. In this review, we organized the teaching strategies into five categories based on the similarities of concepts and teaching techniques that educators had used. The main categories were technology-based strategies, collaborative strategies, simulation-based strategies, research-based strategies, and miscellaneous learning strategies. Among these educational strategies, technologies- and simulation-based strategies were more attractive to students and made their participation more active in the learning process. At present, little is known about the methods of promoting academic engagement in clinical activities. Further experimental research is needed to confirm or disprove the effectiveness of the methods discussed in this paper. We did not find a unique strategy to enhance academic engagement in clinical education activities. One of the possible reasons for this is that learning in clinical settings particularly requires maximum engagement in clinical learning activities. It is recommended that future researchers design and test unique strategies for improving academic engagement in clinical settings.

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### ORCID:

Mohammad Reza Ghasemi: <https://orcid.org/0000-0002-2980-1835>;

Hossein Karimi Moonaghi: <https://orcid.org/0000-0003-0496-2306>;

Abbas Heydari: <https://orcid.org/0000-0002-1082-7488>

**Acknowledgements:** None.

**Funding:** This review was not funded by any companies, research grants, or funds.

**Conflicts of interest:** No potential conflict of interest relevant to this article was reported.

**Author contributions:** Study conception and design: MGH, HKM; data analysis and interpretation: MGH, HKM, AH; drafting the article or revising it critically for important intellectual content revisions for important intellectual content: MGH, HKM, AH; and final approval of the version to be published: MGH, HKM, AH.

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