

# Strategies for Clinical Medical Education in Iran: A Systematic Review

Amin Beigzadeh<sup>1</sup>, Nikoo Yamani<sup>2\*</sup>, Peyman Adibi<sup>3</sup>, Kambiz Bahaadinbeigy<sup>4</sup>

<sup>1</sup> Ph.D of Medical Education, Assistant professor, Leadership and Management Research Center, Kerman University of Medical Sciences, Kerman, Iran

<sup>2</sup> Ph.D of Medical Education, Associate professor, Department of Medical Education, Medical Education Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

<sup>3</sup> Ph.D of Gastroenterology and Hepatology, Professor, Integrative Functional Gastroenterology Research Center, Isfahan University of Medical, Isfahan, Iran

<sup>4</sup> Ph.D of Medical Informatics, Associate professor, Medical Informatics Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran

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**\*Corresponding author:**

Department of Medical Education,  
Medical Education Research  
Center, Isfahan University of  
Medical Sciences, Isfahan, Iran.  
Email: yamani@edc.mui.ac.ir

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## Abstract

**Background:** In order to improve clinical education, after evaluating the current situation and identifying the shortcomings and problems, it is essential to find strategies to change and improve the situation. This results in planning an efficient clinical education program and achieving the educational goals.

**Objectives:** This study aimed at identifying strategies for clinical medical education in Iran.

**Methods:** This systematic review was conducted in 2017 to find strategies for clinical medical education in Iran. Bedside teaching, ward round teaching, ward round, teaching round, training round, grand round, clinical teaching, ambulatory education, and bedside round were the keywords searched in both Persian- and English-language databases. Related articles were carefully reviewed and the key information was extracted. Finally, the data were analyzed in MAXQDA software version 10.

**Results:** After retrieving the related articles, the title and abstract of 593 papers were reviewed, and after excluding the irrelevant and duplicate ones, full-texts of 101 articles were reviewed based on the study inclusion and exclusion criteria. The strategies for clinical medical education in Iran were classified into five categories including infrastructures, areas of clinical education, educational planning, and clinical teachers and students.

**Conclusion:** Improving the quality of clinical education and the effectiveness of the educational system depends on the identification of appropriate strategies. The identified strategies pave the way for achieving targeted educational goals.

**Keywords:** Strategies, Clinical Education, Iran, Systematic Review

## Background

One of the most important missions of universities is to train expert human resources demanded by society. For achieving this goal, it is necessary to plan to identify problems, implement programs, and ultimately resolve problems (1). Medical education is a part of the higher education system that deals with human lives. Therefore, paying more attention to its quantitative and qualitative aspects is of great importance.

Clinical education is the heart of medical education and a pillar in educational planning to shape clinical competency in medical students (2, 3). Clinical education is a process in which medical students gradually acquire skills at the patient's bedside, and by using the gained experiences and logical arguments, get prepared to solve

the patient's problems (4). This environment plays a pivotal role in shaping the professional identity of students (5, 6) and preparing them as a responsible person to maintain and promote the health of society (7).

According to scientific evidence, although clinical education provides valuable opportunities to acquire clinical knowledge, practice clinical reasoning, improve communication skills, practice history taking and physical examination skills, etc. (8), it is replete with challenges and problems, including limited educational opportunities, large numbers of students, lack of resources, and inappropriateness of the clinical setting to learning. Common problems of clinical education include lack of clear goals and expectations, improper adjustment of training to the level of education,

passive observation instead of active participation of learners, insufficient monitoring and feedback, lack of respecting patients' privacy, and humiliation (2). Studies in Iran show that the clinical education is unfavorable. Ziaee et al., in a study reported moderate or low satisfaction of 85.4% of medical students in the clinical education stage concerning the quality of clinical training (9).

The results of the study by Kojouri on the viewpoints of first-year medical residents on clinical education showed that only 25% of the students were satisfied with the educational program (10). Evidence suggests that although bedside teaching was considered as the main part of clinical education for a long time, it is less popular today; so that bedside teaching is moved away from bedside to discussion rooms and conferences (11). The findings suggest that clinical education should be continuously evaluated and monitored because its promotion requires examining the current situation and identifying strategies for its improvement. Then, by these strategies, more effective training can be offered to train medical students and improve the quality of healthcare services.

To the best of our knowledge, there was no study in Iran on the best model of clinical education in terms of effectiveness, but some studies have identified strategies and provided suggestions for improving the current status of clinical education. Janicik and Fletcher performed a workshop with the participation of 135 medical teachers and offered the best model of bedside teaching. The model consisted of three parts: paying attention to the patient's comfort, centralized education, and group dynamics; each had specific objectives and focused on specific skills for effective clinical training (12). In a similar study, Irby provided an experimental model for the best method of bedside teaching, including identifying knowledge areas, training features, and the clinical reasoning process used by physicians during clinical rounds (13-15).

**Objectives:** Despite many studies conducted on the clinical education and its problems, there was no comprehensive research on providing effective clinical education and its strategies in Iran. The current study was the first comprehensive research on the identification of strategies for clinical medical education.

## Methods

The article is part of a PhD thesis in medical education approved by the Ethics Committee of Isfahan University of Medical Sciences (code number: IR.MU.REC.1396.3.165). It is important to mention that the authors of this paper reported the challenges of clinical medical education in Iran in another article (16); the current study aimed at identifying strategies for clinical medical education in Iran from March to October 2017.

In the current study, keywords such as bedside teaching, ward round teaching, ward round, training round, teaching round, grand round, clinical teaching, ambulatory education, and bedside round were first searched in Iranian Persian-language databases, including SID, IranDoc, Magiran, and Barakat Knowledge Network

System. In addition, PubMed, Cochrane, Embase, Scopus, and Web of Science databases were searched to retrieve English-language articles compiled by Iranian authors. Google Scholar was also searched to expand the searching scope. In order to achieve the study objectives, the terms strategies, solutions, medical student, extern, intern, resident, medical teachers, clinical teachers, and patients were also searched separately or in combination with the keywords, using AND and OR operators in both Persian- and English-language databases.

The sample search strategy for English databases was as follows:

[("teaching round" OR "ward round" OR "ward round teaching" OR "bedside teaching" OR "bedside round" OR "training round" OR "grand round" OR "clinical teaching" OR "ambulatory education" OR "clinical education") AND ("medical students" OR "externs" OR "interns" OR "residents" OR "externship" OR "internship" OR "residency" OR "medical teachers" OR "clinical teachers" OR "patients") AND ("solutions" OR "strategies")].

No specific time limit was considered for searching the articles, and searches were performed by one of the authors with the help of a medical librarian specialist. Two evaluators selected the articles, and discrepancies were resolved by consulting with a third party. In terms of comprehensiveness, the references of all eligible articles were evaluated manually in order to retrieve the eligible ones missed via an internet search. To verify the codes (strategies) extracted from the articles, all the retrieved papers were reviewed in two stages: first, when a list of strategies was prepared as a Word 2017 file; and second, when the coding was performed in MAX Qualitative Data Analysis software version 10.

Articles retrieved from each database were stored in an Excel file (Microsoft Office Excel 2017). Then, the articles were merged, and the duplications were deleted. In the next step, the articles were reviewed based on the title and abstract, and the irrelevant ones were excluded. Then, based on the inclusion and exclusion criteria, eligible articles were selected, their content was analyzed, and strategies for clinical medical education were extracted.

The inclusion criteria were: 1) studies on strategies for clinical medical education; 2) studies performed on clinical medical students in the externship, internship, residentship, fellowship as well as clinical teachers and patients, as target groups; 3) availability of the original research articles and their full-texts in Persian or English language; and 4) studies conducted in Iran and clinical medicine.

The exclusion criteria were: 1) articles presented in conferences and seminars, case reports, short reports, letters to the editor, critique, viewpoint, and review articles as well as those conducted on non-medical students and non-clinical medical teachers. 2) articles that their full-texts were unavailable were excluded.

In order to abstract the papers, one of the authors examined different parts of the articles, including the introduction, results, and some parts of the discussion to make sure of the relevance of the subject of the paper to the research objectives. Results of data classification were

reviewed by one of the authors, and an external observer evaluated coding and classifying.

In qualitative papers, sentences related to strategies, as well as themes and subthemes, were extracted.

In quantitative articles, the strategies identified were based on the items mentioned by the author. All extracted items were stored in a Word file.

In order to analyze the data, the extracted strategies

were entered into the MAXQDA software. Each strategy was considered as a code, and all were compared based on differences and similarities. After classification, a relevant title was given to each class (Table 1). The information of the included studies in the systematic review is shown in Table 2. This information includes the name of the first author, study objectives, type of the study, the study methods, the target group, sample size, and the study location.

**Table 1.** Main categories, categories and sub-categories obtained from the reviewed studies on strategies for clinical medical education in Iran

Main category	Category	Sub-category	
Strategies for infrastructures	Improvement of resources and facilities	Necessary infrastructures	
		Educational and treatment equipment	
		Educational and treatment environment	
		Discipline in the clinical setting	
		Compliance with rules and regulations	
		Prerequisites for clinical education	Preparation
			Acquisition of required skills
			Provision of learning opportunities
			Targeted clinical rounds
			Enhancement of communications
Strategies for areas of clinical education	Promotion of clinical rounds	Enhancement of communications	
		Assigning a leader to the round	
		Avoiding sporadic debates at the bedside	
		Avoiding the use of complicated terms	
		Presenting the latest scientific knowledge in rounds	
	Paying more attention to the patient during the round	Ascending participation in rounds	
		Separation of teaching and working rounds	
		Increasing training time	
		Decreasing the number of students	
		Respecting patient's rights	
Training at the clinic	Reducing the number and time of visits		
	Proper planning		
	Setting educational goals		
	Increasing training time		
	Provision of learning opportunities		
Strategies for educational planning	Informing about educational goals	Development of ambulatory care centers	
		Setting the minimum of learning	
	Improvement of clinical teaching methods	Setting goals proportional to needs	
		Revision of clinical teaching methods	
	Informing about professional duties	Determining learning experiences	
		Creating a job description	
	Improvement of education management	Revision of the curriculum	
		Promotion of scientific knowledge	
Reducing the gap between theory and practice	Integration of theoretical and clinical courses		
	Assessment of goals achievement		
Continuous clinical monitoring and evaluation	Provision of feedback		
	Strategies for clinical teachers	Career advancement	
Teachers' responsibility		Teachers' empowerment	
	Strategies for students	Improvement of professional capabilities	Paying more attention to theoretical training
Increasing the motivation			

**Table 2.** The information of articles included in the systematic review

Reference	Study Objectives	Study Type	Methodology	Target Group	Sample Size	Study Location
Ahmadi et al., (17)	Evaluation of teachers' perceptions in identifying and thinking about challenges in medical education to improve the achievement of educational goals and the quality of healthcare services	Phenomenology	Qualitative	Clinical teachers	10	Islamic Azad University, Mashhad branch
Rouhani et al., (18)	Identifying the viewpoints of externs, interns, residents, and teachers on the grand round	Descriptive-analytical	Quantitative	Externs, interns, residents, and clinical teachers	237	Iran University of Medical Sciences
Salari et al., (19)	Determining the degree of interns satisfaction with the quality of clinical training	Descriptive-analytical	Quantitative	Interns	106	Guilan University of Medical Sciences
Fani Pakdel et al., (20)	Evaluation of the viewpoints of medical residents on the various aspects of the grand round program and their level of satisfaction with it	Descriptive-analytical	Quantitative	Residents	34	Mashhad University of Medical Sciences
Arabshahi et al., (21)	Identification of training challenges in clinical rounds	Phenomenology	Qualitative	Clinical teachers	9	Isfahan University of Medical Sciences
Jalalvandi et al., (22)	Evaluation of the quality of clinical education	Descriptive-analytical	Quantitative	Externs	119	Kermanshah University of Medical Sciences
Azemian et al., (23)	Evaluation of barriers and facilitators of clinical education and strategies for improving its quality	Descriptive-analytical	Quantitative	Medical students	92	Bushehr University of Medical Sciences
Anbari et al., (24)	Determining the degree of medical students' satisfaction with the clinical education process	Descriptive-analytical	Quantitative	Interns and externs	97	Arak University of Medical Sciences
Anbari and Ramezani (25)	Identifying barriers to clinical education and providing proper strategies	Descriptive	Quantitative	Interns and externs	84	Arak University of Medical Sciences
Sharifi et al., (26)	Determining the quality and quantity of clinical education	Descriptive-analytical	Quantitative and qualitative	Interns and externs	54	Yasouj University of Medical Sciences
Nasri et al., (27)	Determining educational barriers and problems and strategies for overcoming the problems	Descriptive-analytical	Quantitative	Interns and externs	72	Arak University of Medical Sciences
Adibi and Alizadeh (28)	Identifying the viewpoint of the care team on the impact of the clinical rounds on patients	Descriptive-analytical	Quantitative	Interns and externs	150	Isfahan University of Medical Sciences
Khorasani et al., (29)	Evaluation of the quality of clinical education from the viewpoints of medical teachers and students	Descriptive-analytical	Quantitative	Interns, externs, residents, and clinical teachers	180	Mazandaran University of Medical Sciences

Zamanzad et al., (30)	Evaluation of the degree of satisfaction with training in clinical departments and its affecting factors	Descriptive-analytical	Quantitative	Interns and externs	77	Shahrekord University of Medical Sciences
Adibi and Anjavian (31)	Determining the viewpoints of patients on bedside round	Descriptive	Quantitative	Patients	100	Isfahan University of Medical Sciences
Mortazavi and Razmara (32)	Evaluation of the degree of medical students' satisfaction concerning teachers' performance, facilities, educational methods, etc.	Descriptive-analytical	Quantitative	Interns and externs	400	Isfahan University of Medical Sciences
Fekri and Sarrafinejad (33)	Evaluation of the status of medical education in three academic departments	Descriptive-analytical	Quantitative	Interns and externs	239	Kerman University of Medical Sciences
Avijegan et al., (34)	Evaluation of the quality of ambulatory education from the viewpoint of medical students to improve the quality of education	Descriptive-analytical	Quantitative	Interns and externs	180	Isfahan University of Medical Sciences
Rezaee and Ebrahimi (35)	Identifying factors influencing the learning of medical students in the clinical setting	-	Quantitative and qualitative	Clinical teachers and residents	184	Shiraz University of Medical Sciences

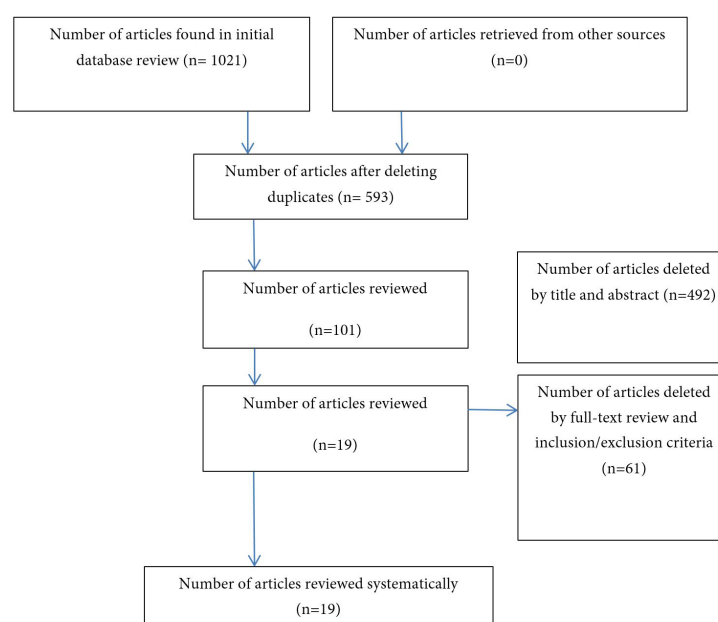
**Results**

In the present study, 1021 articles were initially retrieved from databases, and after deleting duplicates, 593 articles were reviewed based on the title and abstract (546 articles in Persian and 47 in English). Of these, 492 articles were excluded, and 101 entered the next step. Then, the studies were reviewed based on the full-text and inclusion/exclusion criteria, and finally, 19 articles were included in the study, of which 16 were in Persian and 3 in English.

The content of the articles was analyzed, and the

strategies for clinical medical education were extracted. The study flow chart is shown in [Figure 1](#).

In terms of the type of studies, 15 articles were quantitative (79.0%), two qualitative (10.5%), and two qualitative-quantitative (10.5%). In addition, 13 articles were performed based on the viewpoints of medical students (68.4%), two based on the viewpoints of clinical teachers (10.5%), three based on the viewpoints of students and teachers (15.8%), and one using the viewpoints of patients (5.3%) on strategies for clinical medical education ([Table 2](#)).



**Figure 1.** The process of entering articles to the systematic review

## Discussion

Strategies for clinical medical education in Iran (153 codes)

Strategies for infrastructures: This category with 18 codes (11.8%) included improvement of resources and facilities (18 codes).

In order to create a suitable learning environment and provide the required infrastructures, first, the available resources and facilities should be examined, and then measures should be taken to strengthen and develop them. Research has emphasized on equipping libraries in terms of variety, number, and up-to-date resources, as well as providing necessary infrastructures such as the internet (26). Along with the development of infrastructures, it is essential to plan for the required educational and treatment equipment; several studies have noted this key point. Improvement of teaching aids (22), provision of medical facilities and equipment for ambulatory care centers (32), periodic evaluation of facilities available in clinics and managing shortcomings (34), provision of equipment required in clinical rounds (21), and the use of appropriate teaching aids (19) indicate the pivotal role of educational and treatment equipment in the clinical setting. In addition to the necessary facilities and equipment, the atmosphere should also be appropriate for learning and teaching. According to studies, improving and standardizing departments and physical spaces and providing a suitable environment for teachers and students to gain clinical experiences (23) to a large extent can maintain the desired atmosphere for teaching and learning. This can be obtained by providing a conducive learning environment for students via assessing the quality of services and improving them. Failure to pay attention to this issue can lead to a significant academic failure in students (36).

Strategies for clinical education: This category had 80 codes (52.2%) and included the prerequisites for clinical education (14 codes), promotion of clinical rounds (39 codes), paying attention to the patient during the round (8 codes), and training in the clinic (19 codes).

In order to establish an effective and efficient clinical education system, some issues should be considered as prerequisites for education. Discipline in the clinical setting is a prerequisite highlighted in different studies. The establishment of discipline and regularity in clinical rounds (26, 33), careful implementation of the internship program during the shift work, and paying attention to working hours and the time students attend the rotations were the topics noted in different studies (21). Implementing rules and regulations (21) and the observance of ethical codes in the clinical setting (23) were also emphasized. It is recommended that teachers prepare students before or at the beginning of the clinical training course. Studies performed worldwide have also emphasized this issue (37, 38), which is consistent with the results of the present study. The prerequisites for education include preparing teachers and students, acquiring the necessary skills before clinical training, and providing learning opportunities; more items were also noted in the

reviewed studies, including familiarizing students with the basics at the beginning of the course (19), teaching clinical skills on moulage before externship and internship courses (27), starting the education of basic clinical skills from externship (30), providing educational opportunities for students and assigning different tasks to them, and creating opportunities for students to repeat different clinical skills (23). For a targeted clinical education, both teachers and students should be prepared before the course. Preparation of teachers includes planning for training, setting educational goals for each session, identifying students' learning needs, and choosing a reference. Preparation of students can be performed as a working meeting to express requirements, assign a clear clinical role to each student, and determine educational expectations and goals.

Since clinical education and teaching rounds provide countless opportunities for students to acquire clinical competencies and shape their professional identity, improvement of the efficacy of clinical rounds is essential. Research studies have accentuated on the right conditions to increase the quality of clinical rounds. For the targeted ward rounds, the current procedure should be revised, and for changing the current trend, a specific plan has to be developed (20, 28, 31). For achieving the goal, an expert should be assigned to each clinical round in order to evaluate both teachers and students (20). The reduction of sporadic debates in clinical rounds also provides a context to have a targeted education and discuss more practical and applicable aspects or specific points at the bedside (28), through which, by providing new and up-to-date medical information, the latest scientific knowledge in prevention, diagnosis, and treatment arenas is conveyed (18, 20). Also, by increasing the participation of teachers and students and motivating them, suitable learning opportunities can be created. The commitment of all teachers and students to dynamic participation in clinical rounds (20), greater involvement and participation of externs and interns in diagnostic and therapeutic processes (29), attracting the participation of interns, and particularly externs, and allowing them to take patient's history (34), the involvement of teachers and students in bedside teaching processes (21), the involvement of students in training rounds (19), and creating question and answer opportunities for students (23) are the examples for this issue highlighted in some studies. In order to achieve these goals and create a context for more participation, more time should be spent on clinical rounds and attendance of students in the wards (23, 26).

It is recommended that the ward round teaching be conducted according to a specific educational program. This program can be initiated by introducing a clinical case to the students by the teacher and/or presenting the patient's history by one of the students. It is better that the clinical teacher provides further details on the history presented by the student, recounts the key points, and gives appropriate feedback via reminding the positive and negative aspects. It is suggested that the necessary

physical examinations be performed by the teacher in the presence of students. In addition, the opportunity should be provided for the students to repeat and practice, and if necessary, appropriate feedback should also be given to them. All have to be done in a respectful atmosphere with appropriate teacher-student-patient communication. Patient's needs and rights should be specifically considered (20, 23, 28, 30). It is recommended that in bedside teaching, the teacher first introduces himself and others presenting at the patient's bedside. Before teaching, the patient should be informed about the goals and the reason for the students' presence at the bedside. To maximize the patient's participation in the clinical education process, the teacher should consider him as a member of the care team and not as a tool to train the students. Clinical education goals can be better achieved by respecting the patient's rights and obtaining his/her permission.

Proper educational planning and goal setting is a strategy for providing better and more learning opportunities and improving the quality of clinical education. Several studies discussed this issue, considering its high importance. By setting clear goals and assigning topics to ambulatory training in each department (29), and justifying externs and interns before entering the ambulatory settings, as well as benefitting from the cooperation of experienced teachers in the ambulatory care centers (32), a proper plan can be made, according to the conditions and facilities of teaching clinics. The development of ambulatory care centers is also one of the effective strategies for increasing the quality of clinical education. The development and quantitative and qualitative support of public and teaching ambulatory care centers (32) can lead to the provision of an appropriate educational atmosphere with the maximum effectiveness.

Strategies for educational planning: This category had 41 codes (26.8%) and included awareness of educational goals (6 codes), improving clinical teaching methods (7 codes), informing on professional duties (6 codes), improving management (5 codes), reducing the gap between theory and practice (4 codes), and continuous clinical monitoring and evaluation (13 codes).

Determining the students' learning objectives (21, 24, 25) and introducing educational goals at the beginning of each course (26) can lead to the clarification of educational goals. Special attention should be paid in educational planning to the improvement of clinical teaching methods through reviewing the current methods (24, 30) and employing appropriate, up-to-date, and team-based ones (25, 35, 39). In addition to determining the educational goals, the professional duties should correctly and accurately be explained to the students. Providing the students with the lesson plan and explaining their job description at the beginning of the course (27), familiarizing employees with educational activities of students, and determining their scope of activity, as well as informing teachers about students' learning needs, can greatly help to advance the planned goals (23). According to studies, continuous clinical monitoring and evaluation of educational activities (19, 21, 24) and giving feedback

effectively and timely to students (25, 27) should be considered at all the stages of clinical training in order to enhance the achievement of goals in an appropriate and planned educational system.

Strategies for clinical teachers: This category had seven codes (4.6%) and included professional and career advancement (7 codes).

The effectiveness of the training provided by the clinical teachers depends on their responsiveness through timely attendance at clinical departments (23) and commitment to proper and adequate training (35). Teachers should be committed to clinical education, which is achieved through prioritizing teaching over treatment, providing organized and systematic education (40), and allocating enough time for bedside teaching (12, 41).

Several studies have noted the lack of teachers' teaching skills in clinical education (8, 42-45); hence, their teaching skills should be developed by planning and holding training courses and up-to-dating their skills and capabilities (17). According to scientific evidence, among factors influencing the success of organizations, human resources is the major one. Clinical teachers who are role models in terms of performance and behavior can play a pivotal role in training the students (46-48).

Strategies for students: This category had seven codes (4.6%) and included improving professional capabilities (7 codes).

Some studies highlighted the empowerment and motivation of students, along with the empowerment of teachers. Paying particular attention to theoretical training by holding educational conferences (23) and creating motivation and appropriate scientific and spiritual support for students (18, 23, 25) provide a good ground for learning. Studies conducted worldwide have pointed issues such as respect for students (40, 42) and creating motivation and paying attention to them in the training process (41, 45), which are consistent with the results of the present study. One of the most important issues in the training process is the participation of students in education. Participation in educational activities increases learning and helps the teachers to identify weaknesses of learners to eliminate them (49). In a study conducted in Iran, retaining the students' dignity and respecting and not discriminating between them were considered as the main characteristics of a capable teacher (50). Therefore, teachers should pay particular attention to such issues.

## Conclusion

Identifying strategies for clinical education helps teachers to provide more effective teaching for students. This important issue leads to the improvement of the current situation and promotion of the quality of clinical education, resulting in training the skilled and experienced workforce to provide healthcare services for the community. One of the limitations of the present study is the lack of comprehensiveness of some categories and this can be related to the codes extracted from the articles not comprehensively investigating the strategies

for clinical education. The results of the present systematic review, especially regarding teachers and students, have not the necessary and sufficient comprehensiveness.

### Supplementary Material

Supplementary material(s) is available [here](#) [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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