

A systematic review of the literature describing the outcomes of near-peer mentoring and near-peer teaching and learning programs for medical students in Iran

Una revisión sistemática de la literatura que describe los resultados de los programas de tutoría y enseñanza y aprendizaje entre pares para estudiantes de medicina en Irán

Faham Khamesipour¹ , Zohreh Khoshgoftar¹ , Nasrin Khajeali² , Mohsin Yakub³ 

1. Virtual School of Medical Education and Management, Shahid Beheshti University of Medical Sciences, Tehran, Iran

2. Department of Medical Education, Fasa University of Medical Sciences, Fasa, Iran

3. Department of Medical Education, School of Medicine, California University of Science & Medicine, Colton, California, USA

Corresponding author

Faham Khamesipour

E-mail: faham.khamesipour@yahoo.com

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Abstract

Introduction and objective: The complex or peculiar nature of medical studies does not always allow all students to succeed in Iran's academic experiences. The first year of medical studies, for example, is described as stressful and difficult for students. Approaches such as near-peer mentoring and near-peer teaching can be instrumental in supporting students.

Methods: This systematic review aims to analyze the literature describing the outcomes of near-peer mentoring and near-peer teaching and learning programs for medical students in Iran. Scientific databases were explored using keywords such as near-peer mentoring, near-peer teaching, medical students, peer coaching, peer advice, peer guidance, big brothers big sisters mentoring program, peer support and peer counseling, Iran. Out of 17845 studies initially identified, about 14 met the inclusion criteria (programs involving medical students, regardless of the year of study, mentors close to their peers, i.e., in the second year, but not limited to, program located in Iran). The drafting was done according to PRISMA standards.

Results: The results show that there are several outcomes for near-peer mentoring and near-peer teaching. The primary identified outcomes are positive relationships, improving academic support, improving psychosocial support, and developing specific professional skills.

Conclusion: We conclude that near-peer mentoring and near-peer teaching can help students' support and capacity building among medical students in Iran.

Keywords: Near-peer mentoring, near-peer teaching, medical students.

Resumen

Introducción y objetivos: La naturaleza compleja o peculiar de los estudios de medicina no siempre permite a todos los estudiantes tener éxito en las experiencias académicas de Irán. El primer año de los estudios de medicina, por ejemplo, se describe como estresante y difícil para los estudiantes. Enfoques como la tutoría y la enseñanza entre pares pueden ser fundamentales para apoyar a los estudiantes. Esta revisión sistemática tiene como objetivo analizar la literatura que describe los resultados de los programas de tutoría y enseñanza cercana a los pares para estudiantes de medicina en Irán.

Metodología: Se exploraron las bases de datos científicas con palabras clave como near-peer mentoring, near-peer teaching, medical students, peer coaching, peer advice, peer guidance, big brothers big sisters mentoring program, peer support and peer counseling, Iran. De los 17845 estudios identificados inicialmente, unos 14 cumplieron los criterios de inclusión (programas con estudiantes de medicina, independientemente del año de estudio, mentores cercanos a sus pares, es decir, en el segundo año, pero sin limitarse a ellos, programa ubicado en Irán). La redacción se realizó según las normas PRISMA.

Resultados: Los resultados muestran que hay varios trabajos para la tutoría cercana a los pares y la enseñanza cercana a los pares. Los principales resultados identificados son las relaciones positivas, la mejora del apoyo académico, la mejora del apoyo psicosocial y el desarrollo de habilidades profesionales específicas.

Conclusión: Llegamos a la conclusión de que la tutoría entre pares y la enseñanza entre pares pueden contribuir al apoyo y al desarrollo de capacidades de los estudiantes de medicina en Irán.

Palabras clave: Tutoría entre pares, enseñanza entre pares, estudiantes de medicina.

Introduction

Peer mentoring is designed to help to matriculate medical students reach their potential through supported matches with other medical students in the second year or above. Many universities worldwide are opting for near-peer mentoring and near-peer teaching and learning programs to help medical students and ensure their success. In their admissions process, several medical schools highlight peer mentoring in the support system that the school offers to their students. Such a program focuses on young minds development, and the peer acts as a role model and provides guidance to the junior students through a relationship based on trust and caring. This type of mentoring or support meets several requirements: the great diversity of students, the impossibility for faculty mentors to provide personalized support to each student, etc. New student support enables new students to deal with students' diversity and the problems resulting¹.

Peer mentoring can be defined as a formal relationship in which a more qualified student provides guidance and support to another student². It is an academic relationship in which a senior learner (a year or more above) provides guidance and support to a new (junior) learner to enable him to navigate their education³. Peer education is close to a subset of peer education, in which the "teacher" has experiences approximately "2 to 5" years more than a "student"⁴.

The benefits of near-peer mentoring and near-peer teaching have been reported in several studies. Analyzing the literature on near-peer mentoring programs' outcomes, Akinla *et al.* (2018)³ have identified three primary outcomes: professional and personal development, stress reduction, and ease of transitioning. Previous scientific evidence reports that mentoring helps to reduce stress and makes it easier for first-year medical students to adjust⁵.

Previous data attributed beneficial effects to near-peer mentoring and near-peer teaching that deserve to be studied and valued in Iran. This systematic review proposes to analyze literature describing the outcomes of near-peer mentoring and near-peer teaching and learning programs for medical students in Iran. This will also involve; describing the effects of near-peer mentoring schemes and near-peer teaching and learning programs for medical sciences students in Iran's transition phase. Comparison with other countries, identifying similar mentoring programs in medical sciences schools in already published literature, and determining how the evaluation was carried out in such programs. All this will make it possible to decide the factors involved in effective peer mentoring programs and the outcomes' scope in supporting success.

Methodology

The method used to carry out this systematic review was instigated by that used by Akinla *et al.*³, with several modifications. The PRISMA guidelines are observed strictly throughout the search. The data collection and processing considered four main stages.

Eligibility criteria: The most relevant articles from Iran without regard to the publication year were selected based on the keywords searched, the rigor of the methodology used and the conclusions drawn. The articles were in English or Arabic and the impact factor of the publication journal was also considered. The programs presented in each article concern the first-year medical school student and lasted an average of one year. Evaluations of the programs were done throughout the program or at the end depending on the study.

Information sources: The targeted databases were PubMed, Google Scholar, Embase, SID, Magiran, and Scopus. They were screened from January to February 2021.

Search and study selection: Equations were designed from the keywords to research the databases. PRISMA Flowchart showing search process and study selection are presented in **figure 1**.

Data collection process and data items: Data were extracted from the reports using pre-designed forms. The data collected was considered true. No confirmation was made with the investigators.

Definition of a hierarchy of evidence: To optimize the bibliographic search quality and identify the most relevant articles, the hierarchy of evidence successively considered randomized controlled trials, systematic reviews, quantitative studies, qualitative studies/policy documents, and finally, experts' opinions.

Keywords: Equations were designed from the following keywords to carry out the research ("near-peer mentoring "OR" near-peer teaching") AND " 'medical student' "AND Iran; "near-peer mentoring" AND Iran; "peer coaching" OR "peer advice" OR "peer guidance" OR "big brothers big sisters mentoring program" OR "peer support and peer counseling" AND "medical student' 'AND Iran etc.

Inclusion criteria:

Inclusion criteria are:

1. programs involving medical students, regardless of the year of study,
2. Mentors should be close to their peers, i.e., in the second year, but not limited to
3. Program located in Iran. No restrictions were made regarding the year in which the study was carried out.

Exclusion criteria:

Exclusion criteria are

1. lack of sufficient detail about the program and its outcomes
2. Duplicate contents in the articles
3. A mentor is close to their peers (faculty mentor...)
4. Mentorship programs inadequately described, i.e., lacking details on structure, objectives, and/or evaluation
5. Programs aimed at recruiting students to particular specialties or field of interests
6. Mentorship program not related to medical student

Analysis and processing of articles: At the end of the process, 14 articles were retained (figure 1). Their analysis took into account the recommendations of Lincoln and Guba⁶. The recurring codes in the articles were used to write the results.

Results

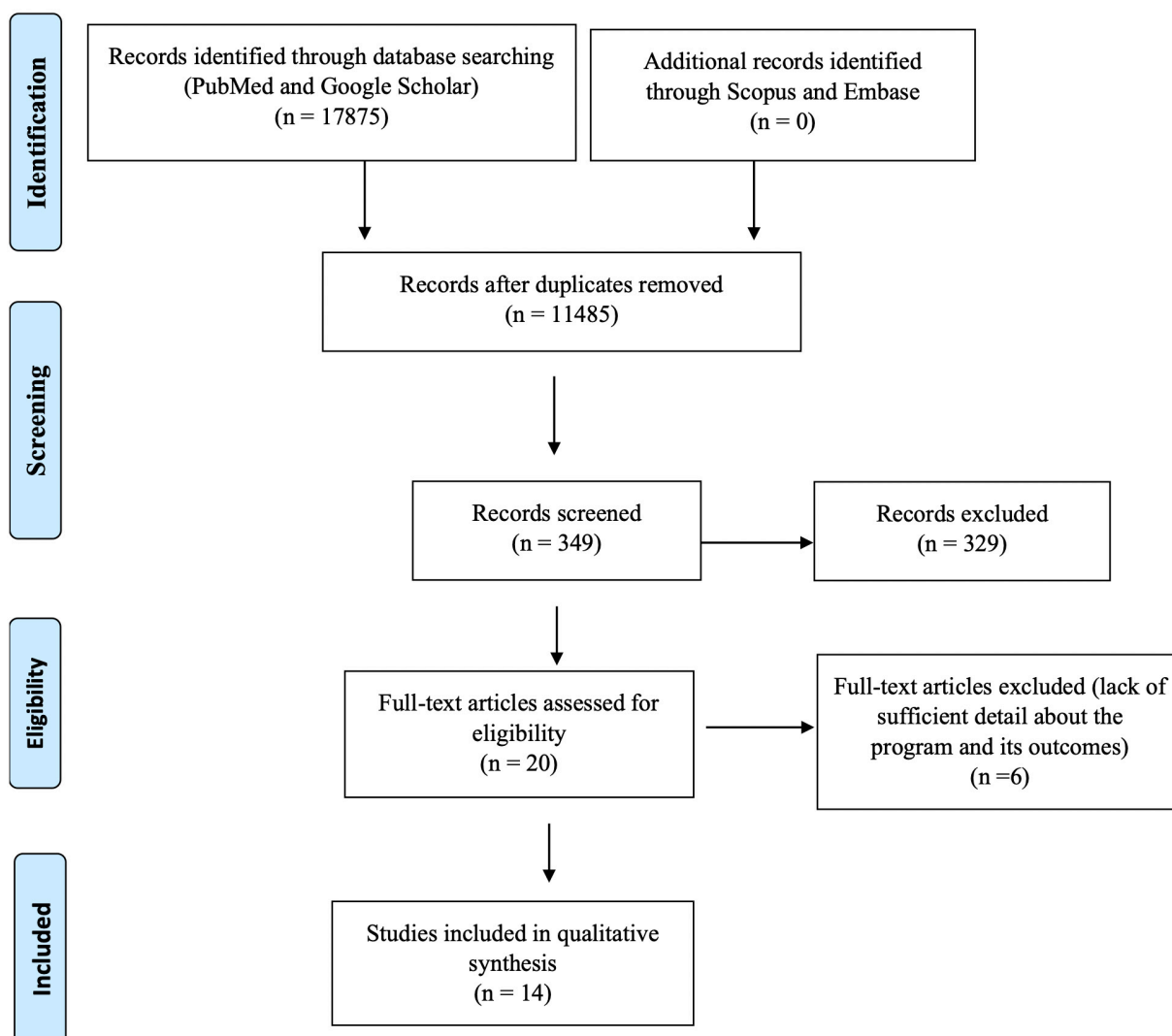
Study selection and characteristics: 14 articles were selected, evaluated for eligibility, and included in the journal from a total of 17875 articles.

Description of each program: The inclusion criteria identified six main programs whose characteristics are summarized in table I.

The dual mentoring program from Tehran University of Medical Sciences (TUMS), School of Medicine:

In 2011, Tehran University of Medical Sciences (TUMS), School of Medicine launched the dual mentoring program⁷. One of the particularities of this program was the students' involvement from the beginning. Four volunteer fifth-year medical students received approval from the school administration to organize the program.

Figure 1: PRISMA Flowchart showing search process and study selection.



The actors involved: The actors involved in the program are 12 medical students (as mentors): 6 from the clinical phase and six from the preclinical phase, with a faculty from the school involved in the mentors' supervision.

Characteristics and preparation of the actors:

An initial preparation phase trained the mentors in communication techniques and the fundamentals of mentoring. Mentoring pairs were then formed (a clinical mentor linked to a preclinical mentor) and named dual mentoring. Thirty-six mentees were randomly selected from among 150 first-year medical students.

Practical implementation: Mentors and mentees were expected to communicate through the following means: telephone calls (once a week at the beginning to form the mentor-mentee relationship, which was gradually reduced to once every three weeks at the end

of the program); e-mail or virtual modalities (including e-mail templates, addressing common first-year student problems and learning concepts and skills); and face-to-face meetings (individually or in groups). Meetings with role models (those who have been successful in junior clinical medical schools) were also part of the program. Due to the likely limitations of the student mentors' consulting abilities in psychology, education, or finance, a referral system was developed to direct recipients to university support or leadership centers, as appropriate. Also, regular weekly inter mentor sessions were organized so that mentors could exchange ideas and share their experiences. To identify the program's reach, impact, and outcome, researchers conducted a study involving all mentors (n=12) and a group of mentees (n=21). Through group discussions, the perceptions of the stakeholders were collected.

Table 1: Anthropometric, clinical and analytical characteristics of participants in the study.

N	Program Name	Academic institutions	Launch year	Aim	Actors involved	Characteristics of mentees and mentor	Main outcomes	References
1	dual mentoring program	Tehran University of Medical Sciences (TUMS), School of Medicine	2011	assist the first-year medical students	Mentor, mentee, a faculty member	individual mentee, two students (one in the clinical phase and another in the preclinical phase)	helpful in guiding students on their first-year courses, clinical mentors were effective in shaping the mentees' professional identity and promoting their interests in basic science subjects	[7]
2	mentoring program	Shiraz Medical School	July 2015	assist the first-year medical students	Mentor, mentee, a full academic professor with experiences in medical science	Three mentees assigned to one mentor	adjusting faster to the new conditions significant increase of grade point average	[8]
3	near-peer education	Nursing students of Ilam University of Medical Sciences	2020	determine the effect of two educational methods (Near-Peer and Instructor) on hand hygiene skills learning in nursing students	near-peer and students	the first-year nursing students as a mentee the last year nursing students as near-peer	Developing specific professional (hand hygiene by Nurses students)	[9]
4	Peer Assisted Learning Approach on clinical Self-efficacy of Nursing Students	Islamic Azad University of Tehran Medical Sciences Branch	2016	Evaluate the effect of using Peer Assisted Learning approach on Clinical self-efficacy of nursing students in selected fields of Islamic Azad University of Medical Sciences in Tehran	Peer-assisted learner Nursing students	Peer-assisted learner Assisted nursing students	Increasing clinical self-efficacy of nursing students	[10]
5	Peer mentoring for medical students during the COVID-19 pandemic via a social media platform	3.1.5. Peer mentoring for medical students during the COVID-19 pandemic via a social media platform	2020	Shiraz University of Medical Sciences	Peer mentors mentee	371 undergraduate students (as mentee) were assisted by ten final year students (as peer mentors)	impact in helping students adapt more quickly to the current emergency condition; Participation in this initiative would have been beneficial for their professional development	[11]

Mentoring program from Shiraz Medical School

Actors involved and their characteristics: Fifteen high-caliber medical students (third or fifth semester) with good communication skills were invited to participate in the program as mentors.

Practical implementation: A preparation phase took place to train the new mentors. Workshops were held to build their unique teaching and learning methods, communication, and consultation techniques. Three mentees were placed under the responsibility of a mentor. Good communication between the mentor and mentees was a criterion for selection. An experienced full professor acted as a supervisor.

Evaluation: The program's effectiveness was evaluated at the end of the first year of the study through a questionnaire (containing five questions) addressed to the mentees⁸.

Near peer teaching on hand hygiene skills learning in nursing students of Ilam University of Medical Sciences: In this case, researchers used a near-peer teaching method to evaluate its impact on learning hand hygiene skills in Ilam University of Medical Sciences nursing students⁹.

Actors and preparation: A mentor group comprises five top-scoring final year students with good speaking skills and sufficient teaching proficiency. They are selected and trained.

Practical implementation: Eight first-year students were assigned to a near-peer mentoring. Exercises were performed in 3 sessions of 30 to 45 minutes each over two weeks. The control group was trained by the instructor according to the usual methods of the faculty. All students were evaluated after four weeks of training.

Peer-assisted learning approach on clinical self-efficacy of nursing students at Islamic Azad University of Tehran Medical Sciences Branch: Experimenting with this type of learning led to dividing the subjects (into two case groups and a simple random sampling control group); the control group received conventional methods (by the clinical instructor) and the case groups by peer learning, and received clinical training for three weeks. The data collection tool included psychometric questionnaires to assess self-efficacy in clinical practice with a 4-point Likert scale in 4 domains¹⁰.

Peer mentoring for medical students during the COVID-19 pandemic via a social media platform: To help medical students manage the stress and anxiety associated with universities'

temporary closure during the COVID-19 pandemic, a virtual social platform was created with Shiraz University's medical school students. Through this platform, high-level medical students were able to mentor and assist undergraduate medical students. The study involved 371 undergraduate students and ten final-year students as experts (with experienced professors). Discussions focused on managing stress and anxiety and how to organize one's work time during the pandemic.

The evaluation involved the use of a questionnaire to measure the effects of this activity. 71% of early-career medical students felt that the social media platform had a significant impact in helping them adapt more quickly to the current emergency conditions. Participation in this initiative would have been beneficial for their professional development¹¹.

The effect of peer mentoring program performance on clinical function in second-semester nursing students: For this program 44-second semester nursing students were selected by census and meeting pre-determined inclusion criteria, were randomly assigned into two groups: a control group (21) and an intervention group (23). The control group received clinical instruction using the traditional method and the second group received instruction based on the peer mentoring program. In the intervention group, a 7th-semester mentor was assigned to 5-4 second-semester students. The mentors were to guide and support the younger students¹².

Outcomes

Positive Relationship: Mentors involved in the dual-mentoring of Tehran University of Medical Sciences (TUMS), School of Medicine, felt that mentoring was a reliable, persistent, and systematic relationship⁷.

Academic support: Improved academic support is a reported outcome in all identified programs. In dual-mentoring, the mentees felt that the mentors provided them with a great deal of academic support, especially when preparing for exams⁷. A significant increase in average scores was observed in the mentees' scores in the mentoring program of Shiraz Medical School⁸.

Psychosocial Support: Psychosocial benefits include increased motivation and hope for mentees and reduced stress in the face of difficulties⁷. The evaluation of Shiraz Medical School's mentoring program showed that 53% of mentees impacted their ability to adapt to new situations⁸.

Developing specific Professional skills: The example of Near peer teaching on hand hygiene skills learning in nursing students of Ilam University of Medical

Sciences is illustrative since the study did not focus on a set of academic activities over a year but the development of a specific competency. The results showed that the scores for hand hygiene competency in the Peer group post-test were significantly higher than those before the intervention ($P < 0.001$). Also, scores for hand hygiene competence between post-test "Near-Peer" group were significantly higher than the instructor group ($P < 0.001$)⁹. In the same sense, the peer-assisted learning approach experimented at Islamic Azad University of Tehran Medical Sciences Branch has resulted in increased clinical self-efficacy of nursing students¹⁰.

Increasing the mentors' abilities and social skills:

In Peer mentoring for medical students during the COVID-19 pandemic via a social media platform at Shiraz University of Medical Sciences, the activity would have contributed to strengthening the mentors' professional skills as future physicians¹¹.

Discussion

This systematic review aimed to analyze the literature describing the outcomes of near-peer mentoring and near-peer teaching and learning programs for medical students in Iran. The inclusion criteria identified six main programs, with each of the specific characteristics. In the analysis, we found that the various studies' outcomes are similar, with benefits for both the mentor and the mentees. The primary outcomes are positive relationships, academic support, psychosocial support, developing specific professional skills, and increasing the mentors' abilities and social skills. Several studies have also highlighted such outcomes for medical student's mentoring programs. According to¹³, "Clinical mentoring programs help to develop students' clinical skills and can increase interest in under-subscribed specialties." Also, positive mentoring can have a significant influence on specialty choice.

There are many similarities between the programs identified in Iran and some mentoring programs in other countries. Many dissimilarities also exist. Examining these two aspects allows you to draw your conclusions about the prospects for improving programs in Iran. The BigSib student peer mentoring program, for example, has been implemented at Universiti Sains Malaysia medical school to enhance and strengthen the training of medical students in soft skills and professional development. A study reported a percentage of 45.9% of students perceiving the program as a success. It would help develop the interpersonal skills and professionalism of students. It is a kind of platform that puts second-year medical students and first-year medical students in interaction. The BigSibs are a group of second-year medical students selected based on academic performance and attitude. The roles of BigSib are to act

as Siblings, Eyes, and Ears for the School, Counselor, Role-model and Trainer (SECRET). As siblings, they are expected to share experiences, support, and help the juniors¹⁴. Medical Education Unit of University College of Medical Sciences, Delhi, initiated in 2009 a mentorship program in which volunteer teachers mentored first-year medical students. The mentor was responsible for interacting with the new students and providing them with an immediate support network¹⁵. In 2010, the program's evaluation results led to introducing a new mentoring style based on "near-peers." An older or more competent peer act as a mentor to a younger one. Results from a study designed to gather the perceptions of mentors and mentees of the program showed that mentees liked the impacts of the experience to the point that they, in turn, wanted to be mentors⁵.

Medical students generally need the more experienced seniors to guide them¹⁶. Participants in this study mentioned that the formal mentor-mentee relationship is more effective because of the reciprocal commitment and reliable, accurate, and specific advice from the mentors. Based on the results, dual mentoring was successful because the preclinical mentors were successful in their mission to guide students on their first-year courses and exams. The clinical mentors were effective in establishing the professional identity of the mentees. The system of involving multiple mentors in medical students has been shown to resolve differences between faculty mentors and mentees¹⁷⁻¹⁹.

However, although few studies have demonstrated the effects of mentoring on mentors, those who participated in this program felt that the relationship established with their mentees was very beneficial to them. It increased their personal and social skills but also gave them a sense of satisfaction, which is consistent with the results of other peer mentoring programs^{20,21}. From a resource-saving perspective, student-led mentoring programs are proving to be an effective alternative to school-based programs. However, independence from school administrations may result in the loss of some important support systems. Fornari et al. (2014) reported that most schools house their mentoring programs in the office of student affairs and the office of academic affairs without any accountability given to undergraduate medical students²².

Limitations

As a limitation of this program, the views of mentors and mentees were identified using a qualitative methodology. Analysis of the short- and long-term outcomes of the mentoring program in terms of academic improvement could certainly quantitatively improve understanding of the program. Another limitation is that the mentoring program was established only for first-year medical students, so different results could be obtained from other students.

Conclusions

We conclude that near-peer mentoring and near-peer teaching can help students' support and capacity building among medical students in Iran.

List of Abbreviations

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; TUMS: Tehran University of Medical Sciences; SECRET: School, Counselor, Role-model and Trainer.

Competing interests

The authors declare that they have no competing interests.

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