http://medicaleducation-bulletin.ir
Review Article (Pages: 1115-1126)

# Challenges and Obstacles of Clinical Medical Education in Iran: A Literature Review

Abbas Bahreini[1], Somayeh Javan[2], Fatemeh Araghi[2], Khatereh Shariati[3], *Masumeh Ghazanfarpour[4]

[1]MD, Shiraz University of Medical Sciences, Shiraz, Iran. [2]School of Paramedical Sciences, North Khorasan University of Medical Sciences, Bojnurd, Iran. [3]Department of Medical Education, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran. [4]Associate Professor of Reproductive Health, Kerman University of Medical Sciences, Kerman, Iran.

**Abstract**

***Background:*** Clinical education is vital for training competent healthcare professionals. In Iran, numerous obstacles hinder quality training and practical skill development. This study aims to identify key challenges in clinical medical education and proposes practical, evidence-based strategies to improve its effectiveness and overall quality.

***Materials and Methods:*** This narrative review involved a comprehensive literature search conducted independently by two reviewers using both Persian and English keywords, including "challenges of clinical education," "medical education," and "quality of clinical education." The search covered reputable databases up to April 2025, including Scopus, PubMed, Web of Science, SID, CIVILICA, and Google Scholar. Relevant data were systematically extracted, analyzed, and categorized into key themes encompassing challenges, impacts, and solutions in clinical medical education.

***Results:*** Clinical medical education in Iran faces multiple interconnected challenges that undermine its overall quality. These challenges include overcrowded and inadequately equipped clinical environments, curricula that lack alignment with practical clinical needs, and weakened faculty-student relationships that negatively affect motivation and engagement. Insufficient educational infrastructure further impedes effective training in evidence-based medicine. Additionally, assessment methods predominantly emphasize rote memorization rather than promoting critical thinking and practical skills. The COVID-19 pandemic has also further limited clinical access. Addressing these issues calls for comprehensive reforms focused on improving infrastructure, modernizing curricula through competency-based training, enhancing faculty development with an emphasis on mentorship and psychological support, implementing structured communication tools, and strengthening academic-clinical collaborations.

***Conclusion:*** Clinical medical education in Iran faces challenges such as inadequate infrastructure, misaligned curricula, weak faculty-student communication, and outdated assessment methods. Improving infrastructure, emphasizing practical skills, enhancing support systems, and adopting competency-based assessments are essential to elevate education quality, prepare competent healthcare professionals, and promote community health.

***Key Words:*** Clinical education, Clinical assessment, Educational challenges, Iran, Medical students.

*Please cite this article as: Bahreini A, Javan S, Araghi F, Shariati Kh, Ghazanfarpour M. Challenges and Obstacles of Clinical Medical Education in Iran: A Literature Review. Med Edu Bull 2025; 6(2): 1115-26. DOI: **10.22034/MEB.2025.544604.1122**

***Corresponding Author:***

Masumeh Ghazanfarpour, PhD, Kerman University of Medical Sciences, Kerman, Iran.

Email: masumeh.ghazanfarpour@yahoo.com

Received date: Apr. 12, 2025; Accepted date: Aug.22, 2025

## 1- INTRODUCTION

Clinical education in medical sciences plays a vital role in training competent and skilled professionals by bridging theoretical knowledge with practical skills and preparing students to face the complexities and real-world challenges of healthcare (1, 2). Given the rapid advancements in medical sciences, emerging technologies, and the dynamic, evolving needs of society, there is an increasing need for continuous review of educational structures, teaching methods, and assessment approaches to meet new expectations and enhance the effectiveness of training (3, 4).

Innovative educational approaches, such as evidence-based learning, skill-oriented methods, and continuous support for students in clinical settings, have created numerous opportunities to improve the quality of education (5–7). Furthermore, fostering greater collaboration between faculty and students and creating a supportive and motivating environment are important factors for professional growth and enhancing students' learning motivation.

In Iran, the medical education system is undergoing transformation and development. Despite challenges such as curriculum misalignment, infrastructural limitations, and equipment shortages, there are substantial capacities for reform and advancement (2, 8, 9). Enhancing coordination between theoretical and clinical education, utilizing modern technologies, and focusing on training students capable of addressing complex clinical problems are key priorities to ensure improved education quality and to produce graduates responsive to societal needs (10–14).

Moreover, with the increasing burden of disease and the complexities of the healthcare system, there is a growing need for innovative mechanisms and continuous improvements in educational programs. In this context, effective interaction between theoretical and practical components, along with sustained support for students, paves the way for better practical learning and greater enthusiasm for the medical profession (15–17).

Accordingly, reviewing the current status of clinical education, identifying opportunities, strengths, and existing challenges, and proposing efficient, evidence-based solutions can provide a suitable foundation for advancing this field and ultimately improving community health and the quality of healthcare services (4, 18–21).

This study aims to identify the challenges and barriers in clinical education of medical sciences in Iran and to propose practical, evidence-based strategies to improve its quality, ultimately supporting the training of a competent and dedicated healthcare workforce.

## 2- MATERIALS AND METHODS

### 2-1. Study Design

This study is a narrative review aimed at analyzing and summarizing existing evidence on the challenges, barriers, and strategies to improve the quality of clinical education in medical sciences in Iran. A comprehensive and systematic search was conducted across reputable international and national scientific databases, including PubMed, Scopus, Web of Science, Magiran, CIVILICA, and Google Scholar. To ensure thorough coverage, a combination of Persian and English keywords such as "clinical education," "medical sciences," "challenges," "barriers," "quality of education," "Iran," and related terms was used. The search period was limited to studies published up to April 2025 to include the most recent evidence.

### 2-2. Article Selection Process

An initial screening of titles and abstracts was independently performed by two researchers. Full texts of articles meeting the preliminary criteria were then carefully reviewed. In cases of disagreement, resolution was sought through discussion between the two reviewers; if consensus was not reached, a third reviewer was consulted to make the final decision.

### 2-3. Inclusion and Exclusion Criteria

Included studies directly addressed clinical education in medical sciences in Iran and explored challenges, barriers, opportunities, or strategies for quality improvement. Articles unrelated to the topic, duplicates, low-quality studies, and supplementary reports were excluded to ensure relevance and credibility. The inclusion criteria encompassed primary research studies, review articles, qualitative, quantitative, and systematic studies published in Persian and English. The geographical focus was limited to Iran; studies conducted outside this context or unrelated were excluded. Additionally, articles lacking sufficient detail, of inadequate quality, non-peer-reviewed reports, news articles, duplicates, and publications in languages other than Persian and English that were inaccessible for review were excluded. This rigorous selection process was designed to ensure authenticity, relevance, and high data quality for evidence-based analysis.

### 2-4. Quality Assessment

This review evaluated diverse study types—qualitative, quantitative, systematic, and review articles—focused on clinical medical education in Iran to ensure validity and reliability. Quality appraisal was tailored to each study type: qualitative studies were assessed using the Critical Appraisal Skills Programme (CASP) framework, which evaluates methodology, clarity, rigor in data collection and analysis, and trustworthiness of findings (22). Review and systematic studies were evaluated based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparent reporting, comprehensive search strategies, appropriate inclusion criteria, and minimization of bias throughout the review process (23).

### 2-5. Data Extraction and Analysis

Two independent reviewers systematically extracted and recorded key information from the selected articles. The data were then organized and coded according to main themes such as challenges, barriers, strategies, and related topics. These organized findings are presented in **Table 1** and discussed in detail in the results section, offering a coherent and comprehensive synthesis.

### 2-6. Ethical Considerations

As this study is based on the review of published literature and does not involve primary data collection, ethical approval was not required. Nevertheless, intellectual property rights and accurate academic referencing of all sources were strictly observed to uphold research integrity.

## 3- RESULTS

The challenges in clinical medical education in Iran span multiple domains, including clinical environments, curriculum design, faculty-student interactions, infrastructure, and assessment methods. These interconnected factors collectively undermine the quality of medical training and negatively impact healthcare outcomes. Table 1 and the following sections summarize the main challenges, their impacts, and recommended strategies for improvement.

### 3-1. Key Challenges and Barriers in Clinical Medical Education in Iran

#### a) Clinical Environment and Infrastructure

- The quality of clinical settings is often inadequate, with overcrowded wards and insufficient educational and medical resources limiting students' practical learning experiences (24–26).
- Limited access to modern medical equipment and skills centers undermines effective evidence-based medicine (EBM) training (27, 28).
- Inequitable resource allocation and poor planning have caused disparities in educational opportunities across different regions (28, 29).

**b) Educational Programs and Curriculum Alignment**

- Iranian medical curricula tend to emphasize theoretical knowledge over practical skills and often lack alignment with clinical realities, resulting in gaps in graduate competencies (1, 30, 31).
- Inadequate clinical exposure leads to poor performance in practical assessments such as OSCEs, leaving students unprepared for clinical duties (30, 32).
- Evaluation methods focused on rote memorization hinder the development of critical thinking and practical competencies (27, 33, 34).
- Curriculum analyses reveal misalignment with labor market needs and insufficient implementation of competency-based education (35).

**c) Faculty-Student Interaction**

- Strained faculty-student relationships and lack of sufficient mentorship reduce student motivation and engagement (33, 34, 36).
- Lack of structured academic support and psychological counseling increases student distress and burnout rates (37–39).
- Similar challenges have been documented in nursing education, where inadequate instructor support limits student learning (40–42).

### 3-2. Impacts on Educational Quality and Healthcare Outcomes

- Deficiencies in clinical skills result in reduced readiness for clinical practice and increase the risk of medical errors (43–47).
- Insufficient practical training negatively affects the quality of patient care and has long-term public health consequences (47–49).
- Decreased satisfaction and motivation among students threaten the quality of the future healthcare workforce (50–53).

### 3-3. Strategies to Improve Clinical Medical Education

- Strengthening infrastructure through adequate funding, modern clinical skills centers, and improved resources is essential (54–57).
- Curriculum reform should focus on competency-based training, practical skills, patient-centered care, and integration of evidence-based medicine (2, 27).
- Faculty development programs emphasizing mentorship skills, humanistic teaching, and structured psychological support can enhance student engagement and reduce burnout (34, 37, 59, 60).
- Revamping assessment methods to incorporate OSCEs and workplace-based assessments with continuous feedback fosters effective skill acquisition (30, 61).
- Enhancing academic-clinical collaboration via joint teaching and structured communication can better align learning goals and bridge the theory-practice gap (62–64).

**Table-1:** Summary of Challenges, Impacts, Proposed Strategies, and Quality Assessment Results in Clinical Medical Education in Iran.

| Domain | Key Challenges | Impacts and Outcomes | Suggested Strategies | References | Quality Assessment Results |
|---|---|---|---|---|---|
| Clinical Environment | Limited resources, overcrowding, inadequate infrastructure | Reduced practical learning, educational inequity | Investment in infrastructure and technology | 24–29 | Moderate to high-quality studies across qualitative and quantitative designs |
| Educational Programs | Theoretical focus, poor clinical alignment, outdated curricula | Skill gaps, low clinical readiness, poor practical assessment | Competency-based curriculum reform, increased practical training | 1, 30–35 | High-quality studies; consistent evidence despite some design variability |
| Faculty-Student Interaction | Insufficient mentorship, low motivation, weak academic support | Student distress, disengagement, reduced learning outcomes | Faculty training, structured mentorship, psychological support | 33, 34, 36–39, 40–42 | High-quality qualitative (CASP) and mixed quantitative studies support findings |
| Assessment Methods | Rote memorization emphasis, inadequate practical evaluation | Poor development of critical thinking and skills | Performance-based, continuous assessments, feedback loops | 27, 61 | Valid and reliable systematic reviews and mixed-method studies |
| Academic-Clinical Link | Weak collaboration, inconsistent communication | Theory-practice gap, compromised education quality | Joint teaching, structured communication tools | 62–64 | Limited but high-quality evidence (PRISMA) supports collaboration importance |

## 4- DISCUSSION

Clinical medical education is fundamental to training competent and responsive physicians and plays a crucial role in improving healthcare quality. The findings of this study, supported by existing literature, highlight that clinical education in Iran faces multifaceted challenges across environmental factors, curriculum design, faculty-student interactions, infrastructure, and assessment methods. These interconnected barriers collectively undermine the effectiveness of training and ultimately the quality of healthcare delivery. These results are consistent with international research in medical education.

A key obstacle is the inadequate quality of clinical environments. Insufficient equipment, overcrowded wards, and the lack of well-equipped skills centers limit hands-on learning opportunities and reduce students' exposure to authentic clinical conditions (1, 2, 24). Similar global studies emphasize that the quality of clinical settings significantly influences the acquisition of clinical skills and learners' confidence; deficient environments impair deep and meaningful learning (65).

Regarding curriculum design, there is a considerable mismatch between educational content and practical clinical needs. An overemphasis on theoretical knowledge at the expense of skill development and critical thinking results in graduates who are ill-prepared for clinical duties and perform poorly in practical exams such as OSCEs (30, 66–69). This issue aligns with findings from successful education systems worldwide that have implemented competency-based curricula focusing on skill acquisition, comprehensive assessment, and practical readiness (70–72).

Faculty-student interactions are also pivotal in fostering motivation and mental well-being. Inadequate mentorship, limited structured support, and impersonal educational relationships increase student stress and burnout, negatively affecting engagement and learning outcomes (39, 73). International evidence suggests that

supportive faculty relationships and positive learning environments substantially enhance learner motivation and educational success (74).

The consequences of these challenges are significant. Insufficient practical skills training reduces graduates' readiness to deliver quality care and increases the risk of medical errors (75–77). Similar international studies confirm that inadequately trained graduates adversely impact patient safety and satisfaction (78).

To address these issues, multifaceted strategies are recommended. Improving infrastructure by establishing and equipping specialized clinical skills centers, along with effective resource allocation, is essential (79). Curriculum reform towards competency-based education—emphasizing patient-centered care, practical skills, and integration of Evidence-Based Medicine (EBM)—is crucial (27, 80, 81). Globally, teaching EBM has been shown to foster critical thinking and enhance clinical decision-making (82).

Enhancing faculty development programs that focus on teaching skills, mentorship, and psychological support can improve student engagement and mental health (74, 83, 84). Revising assessment methods to expand OSCE use and incorporate workplace-based assessments with continuous feedback will promote deeper learning and skill mastery (30, 72, 85, 86).

Finally, strengthening academic-clinical collaboration through joint teaching initiatives and structured communication tools can bridge the theory-practice gap and increase curricular coherence. International experience highlights that integrated networks between academia and clinical sites enhance educational outcomes (62, 87–90).

In summary, overcoming current barriers requires a systemic and comprehensive approach, encompassing infrastructure enhancement, curricular transformation, faculty empowerment, and robust quality monitoring systems. Implementing such integrated reforms will support the development of a new generation of competent, dedicated, and community-responsive physicians, ultimately improving healthcare delivery nationwide.

## 5- CONCLUSION

This study identified key challenges in clinical medical education in Iran across several domains, including the quality of clinical environments, curriculum alignment with practical needs, faculty-student interactions, infrastructure, and assessment methods. Insufficient facilities and modern equipment, an overemphasis on theoretical knowledge, and inadequate practical training contribute to reduced student preparedness for clinical practice and adversely affect the quality of healthcare services. Additionally, strained faculty-student relationships and a lack of psychological support diminish student motivation and increase the risk of burnout.

To improve the quality of clinical education, it is essential to strengthen infrastructure by investing in well-equipped clinical skills centers and reform curricula toward competency-based, practical, and patient-centered training. Enhancing faculty development in mentorship, teaching skills, and psychological support, adopting dynamic assessment methods such as OSCE and workplace-based evaluations with continuous feedback, and fostering academic-clinical collaboration through joint teaching and structured communication can bridge the gap between theory and practice and enhance curricular coherence. Implementing these strategies can facilitate the training of skilled, committed healthcare professionals and ultimately advance the clinical education system in Iran.

## 6- AUTHORS' CONTRIBUTIONS

Study conception or design: AB, and MG; Data analyzing and draft manuscript preparation: SJ, FA, and KS; Critical revision of the paper: AB; Supervision of the research: MG; Final approval of the version to be published: AB, SJ, FA, KS, and MG.

## 7- CONFLICT OF INTEREST: None.

## 8- REFERENCES


1. Beigzadeh, A., Yamani, N., Bahaadinbeigy, K., Adibi, P. Challenges and Problems of Clinical Medical Education in Iran: A Systematic Review of the Literature. Strides in Development of Medical Education, 2019; 16(1): -. doi: 10.5812/sdme.89897.

2. Vahdat S, Tanhaei N, Najafi S, Salemi MH, Karbasian F. Investigating the barriers to clinical education among medical students in Iran: A narrative review study. J Family Med Prim Care. 2022 Dec;11(12):7537-7542. doi: 10.4103/jfmpc.jfmpc_994_21. Epub 2023 Jan 17.

3. Ahmady S, Khani H. The situational analysis of teaching-learning in clinical education in Iran: a postmodern grounded theory study. BMC Med Educ. 2022 Jul 2;22(1):520. doi: 10.1186/s12909-022-03577-3. PMID: 35780110; PMCID: PMC9250741.

4. Shayan A, Golalizadeh Bibalan F, Shafaei M, Rahnavardi M, Masoumi S Z. Challenges of Clinical Education in Midwifery and Strategies to Improve It: A Qualitative Study.Educ Res Med Sci.2019;8(1):e88228.https://doi.org/10.5812/erms.88228.

5. Kojouri J, Charkhandaz M, Hojat M. The reasons for the decrease in learning motivation of medical students in South Iran. J Educ Health Promot. 2025 Feb 28;14:73. doi: 10.4103/jehp.jehp_1243_23. PMID: 40144160; PMCID: PMC11940057.

6. Ghanbari afra L, Aliakbarzadeh Arani Z, Salmani S, Farghadanai Z. The Relationship between Clinical Education Status and Academic Motivation in Students of Qom University of Medical Sciences. Res Med Edu 2020;11(4):3-12. http://rme.gums.ac.ir/article-1-850-en.html.

7. Shokrpour, N., Nasiri, E., Pakdel, F., Shahbazi, M. Investigating the Relationship between Academic Motivation and Academic Performance in Clinical Students of Shiraz University of Medical Sciences. Sadra Medical Journal, 2024; 12(4): 513-27. doi: 10.30476/smsj.2024.101193.1479.

8. Dehghan,F. The Academic Motivation and Academic Achievement in Iranian Universities of Medical Sciences: A systematic Review and Meta-Analysis. International Journal of Education and Cognitive Sciences, 2023; 4(3): 54-65. doi: 10.61838/kman.ijecs.4.3.6.

9. Mohammad Saadati, Vahid Sabri, Hossein Motaarefi, Moslem Bayrami, Amirreza Karimkhani. Characterizing student engagement across medical universities in Iran: a national qualitative study. Front. Educ., 2025;10:1-9. https://doi.org/10.3389/feduc.2025.1512232.

10. Sultan, M.A., Miller, E., Tikkanen, R.S. et al. Competency-based education and training for Community Health Workers: a scoping review. BMC Health Serv Res 2025;25: 263. https://doi.org/10.1186/s12913-025-12217-7.

11. Janssens O, Embo M, Valcke M, Haerens L. When theory beats practice: the implementation of competency-based education at healthcare workplaces : Focus group interviews with students, mentors, and educators of six healthcare disciplines. BMC Med Educ. 2023 Jun 29;23(1):484. doi: 10.1186/s12909-023-04446-3. PMID: 37386406; PMCID: PMC10308607.

12. Gruppen LD, Mangrulkar RS, Kolars JC. The promise of competency-based education in the health professions for improving global health. Hum Resour Health. 2012 Nov 16;10:43. doi: 10.1186/1478-4491-10-43. PMID: 23157696; PMCID: PMC3543172.

13. Ross S, Hauer KE, van Melle E. Outcomes are what matter: Competency-based medical education gets us to our goal. MedEdPublish (2016). 2018 Apr 12;7:85. doi: 10.15694/mep.2018.0000085.1. PMID: 38089223; PMCID: PMC10711948.

14. Oshiro, T., Suzuki, S., Kagawa, N. *et al.* Integration of early clinical exposure into curriculum enhances self-assessment of professional competencies in medical

practice. BMC Med Educ., 2025; 25: 1139. https://doi.org/10.1186/s12909-025-07678-7.

15. Heidari H, Mardani Hamooleh M. Improving Communication Skills in Clinical Education of Nursing Students. JCCNC 2015;1(2):77-82. http://jccnc.iums.ac.ir/article-1-42-fa.html.

16. Friedman DB, Arent MA, Yelton B, Sakhuja M, Haynes VE, Noblet S, Brandt HM, Isenhower WD, Wandersman A, Zona D, New C, Fedrick D, Scaccia J, Bruner L. Development of a Clinical-Academic-Community Collaboration to Improve Health Literacy. J Prim Care Community Health. 2020 Jan-Dec;11:2150132720957440. doi: 10.1177/2150132720957440.

17. Hobenu KA, Adefuye AO, Naab F, Nyoni CN. Strategies to enhance clinical teaching and learning in undergraduate nursing education: A scoping review. PLoS One. 2025 Jun 10;20(6):e0305789. doi: 10.1371/journal.pone.0305789. PMID: 40493639; PMCID: PMC12151355.

18. Nourah Alselaiti. Enhancing student engagement and learning outcomes through education technologies in medical education. World Journal of Advanced Research and Reviews, 2023, 19(03): 1356–67.

19. Challa KT, Sayed A, Acharya Y. Modern techniques of teaching and learning in medical education: a descriptive literature review. MedEdPublish (2016). 2021 Jan 21;10:18. doi: 10.15694/mep.2021.000018.1. PMID: 38486533; PMCID: PMC10939590.

20. Shaterjalali M, Changiz T, Yamani N. Optimal clinical setting, tutors, and learning opportunities in medical education: A content analysis. J Educ Health Promot. 2018 Oct 29;7:130. doi: 10.4103/jehp.jehp_56_18. PMID: 30505858; PMCID: PMC6225401.

21. Christine McCallum, Jamie Bayliss, Elaine Becker, Kim Nixon-Cave, Yvonne Colgrove, Janna Kucharski-Howard, et al, The Integrated Clinical Education Strategic Initiatives Project—Development of Parameters to Guide Harmonization in Clinical Education: A Scoping Review, Physical Therapy, 2019;99(2):,147–72. https://doi.org/10.1093/ptj/pzy135.

22. Critical Appraisal Skills Programme (CASP) (2018) Qualitative Study Checklist. Available from: https://casp-uk.net/wp-content/uploads/2018/01/CASP-Qualitative-Checklist-2018.pdf.

23. Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & the PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. PLoS Medicine, 2009;6(7): e1000097.

24. Azizi S, Bashirian S. Challenges of Clinical Education for Iranian Nursing Students: A Perspective on the Need to Revise Practical Training Methods. Med Edu Bull 2025; 6(1): 1077-81. doi: 10.22034/MEB.2025.536831.1117.

25. Rassouli M, Zagheri Tafreshi M, Esmaeil M. Challenges in clinical nursing education in Iran and strategies. Clin Exc 2014;2(1):11-22. http://ce.mazums.ac.ir/article-1-76-en.html.

26. Eghbali, T., Sarkoohi Jabalbarezi, Z., Nouhi, E. Factors Affecting Clinical Education Standards in Nursing in Iran: A Systematic Review. Strides in Development of Medical Education, 2024; 21(1): 70-80. doi: 10.22062/sdme.2024.199191.1307.

27. Khanjani N, Tabrizi R, Maghsoudi A. The obstacles of teaching evidence based medicine in Iran, from the view point of clinical academics and medical students; a qualitative study. American Journal of Educational Research. 2013;1(4):143 - 48. doi: 10.12691/education-1-4-5.

28. Salari H, Najm F, Yazdankhahfard M, Esfandiari A. Challenges, barriers and solutions for implementing clinical practice guidelines: a qualitative study in southern Iran. BMJ Open Qual. 2024 Jul 23;13(3):e002595. doi: 10.1136/bmjoq-2023-002595. PMID: 39043580; PMCID: PMC11268055.

29. Akbari Sari A, Rezaei S, Homaie Rad E, Dehghanian N, Chavehpour Y. Regional Disparity in Physical Resources in the Health Sector in Iran: A Comparison of Two Time Periods. Iran J Public Health. 2015 Jun;44(6):848-54. PMID: 26258098; PMCID: PMC4524310.

30. Mirzazadeh A, Bavarian B, Labaf A, Afshari A, Nikoo M, Meshkani ZS, Khashayar P. Curriculum gaps in teaching clinical skills to Iranian undergraduate medical students. Arch Med Sci. 2013 Apr 20;9(2):309-13. doi: 10.5114/aoms.2013.33073. Epub 2013 Feb 18.

31. Beigzadeh, A., Yamani, N., Adibi, P., Bahaadinbeigy, K. Strategies for Clinical Medical Education in Iran: A Systematic Review. Strides in Development of Medical Education, 2020; 17(1): 1-9. doi: 10.22062/sdme.2020.91011.

32. Mohsen Nazarzadeh Zare, Ehsan Parvin; The reasons for the gap between academic education and the required skills of the labor market in Iran. Journal of Applied Research in Higher Education,2024;16(3):831–42. https://doi.org/10.1108/JARHE-02-2023-0052.

33. Holles, C. Faculty-Student Interaction and Impact on Well-Being in Higher Education. Dissertations, 2021. https://digscholarship.unco.edu/dissertations/758.

34. Nugent, Tisome. The Impact of Teacher-student Interaction on Student Motivation and Achievement. Electronic Theses and Dissertations, 2009. 3860. https://stars.library.ucf.edu/etd/3860.

35. Ghaffari R, Amini A, Yazdani S, Alizadeh M, Salek Ranjbarzadeh F, Hassanzadeh Salmasi S. Comparative Study: Curriculum Of Undergraduate Medical Education In Iran And In A Selected Number Of The World's Renowned Medical Schools. Iran J of Medical Education 2012;11(7):819-31. http://ijme.mui.ac.ir/article-1-1006-en.html.

36. Knight AW. How Clinical Instructor Behavior Affects Student Clinical Engagement from a Motivational Perspective. J Nucl Med Technol. 2018 Jun;46(2):99-106. doi: 10.2967/jnmt.118.209320. Epub 2018 May 3. PMID: 29724802.

37. Alhassan AI. Implementing Faculty Development Programs in Medical Education Utilizing Kirkpatrick's Model. Adv Med Educ Pract. 2022 Aug 23;13:945-954. doi: 10.2147/AMEP.S372652.

38. Al-Eraky MM, Taylor DCM. Faculty development through higher degrees: AMEE Guide No. 180. Med Teach. 2025 Feb 3:1-11. doi: 10.1080/0142159X.2025.2458293. Epub ahead of print. PMID: 39901645.

39. Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: causes, consequences, and proposed solutions. Mayo Clin Proc. 2005 Dec;80(12):1613-22. doi: 10.4065/80.12.1613. PMID: 16342655.

40. Azmand S, Ebrahimi S, Iman M, Asemani O. Learning professionalism through hidden curriculum: Iranian medical students' perspective. J Med Ethics Hist Med. 2018 Sep 9;11:10. PMID: 31346387; PMCID: PMC6642446.

41. Jasemi M, Whitehead B, Habibzadeh H, Zabihi RE, Rezaie SA. Challenges in the clinical education of the nursing profession in Iran: A qualitative study. Nurse Educ Today. 2018 Aug;67:21-26. doi: 10.1016/j.nedt.2018.04.010. Epub 2018 Apr 21. PMID: 29727826.

42. Azizi S, Bashirian S. Challenges of Clinical Education for Iranian Nursing Students: A Perspective on the Need to Revise Practical Training Methods. Med Edu Bull 2025; 6(1): 1077-81. doi: 10.22034/MEB.2025.536831.1117.

43. Choudry ZA, Ayub A, Badar SE. Preparedness of Medical Graduates to serve in clinical settings independently: An exploratory qualitative study. Pak J Med Sci. 2022 Mar-Apr;38(4Part-II):785-790. doi: 10.12669/pjms.38.4.5517. PMID: 35634596; PMCID: PMC9121949.

44. Chaou CH, Yu SR, Chang YC, Ma SD, Tseng HM, Hsieh MJ, Fang JT. The evolution of medical students' preparedness for clinical practice during the transition of graduation: a longitudinal study from the undergraduate to postgraduate periods. BMC Med Educ. 2021 May 6;21(1):260. doi: 10.1186/s12909-021-02679-8.

45. Dhaniwala NS. Declining clinical skills in medical education: A perspective on its causes and potential solutions. Yemen J Med. 2023;2(1):1-3.

46. Faustinella F, Jacobs RJ. The decline of clinical skills: a challenge for medical schools. Int J Med Educ. 2018 Jul 13;9:195-197. doi: 10.5116/ijme.5b3f.9fb3.

47. Rizvi DS. Health education and global health: Practices, applications, and future research. J Educ Health Promot. 2022 Aug 25;11:262. doi: 10.4103/jehp.jehp_218_22. PMID: 36325224; PMCID: PMC9621358.

48. Hon JJ. Embracing Global Health in Medical Education: A Necessity for Modern Doctors. JACC Case Rep. 2024 Sep 4;29(17):102498. doi: 10.1016/j.jaccas.2024.102498. PMID: 39359520; PMCID: PMC11442170.

49. Heidarpoor, P., Yazdani, S. Community-related Medical Education Classification: A Critical Review. Strides in Development of Medical Education, 2024; 21(1): 138-55. doi: 10.22062/sdme.2024.199086.1315.

50. Amini K, Salehzadeh M, Noktehsanj R. Assessing the relationship between teaching quality and satisfaction with clinical teachers among medical students: a correlational cross-sectional study. BMJ Open. 2024 Dec 3;14(12):e088351. doi: 10.1136/bmjopen-2024-088351.

51. Aliafsari Mamaghani E, Rahmani A, Hassankhani H, Zamanzadeh V, Campbell S, Fast O, Irajpour A. Experiences of Iranian Nursing Students Regarding Their Clinical Learning Environment. Asian Nurs Res (Korean Soc Nurs Sci). 2018 Sep;12(3):216-222. doi: 10.1016/j.anr.2018.08.005. Epub 2018 Aug 28. PMID: 30165246.

52. Rezaei B. Quality of clinical education (A case study in the viewpoints of nursing and midwifery students in Islamic Azad University, Falavarjan Branch). Educ Strategy Med Sci 2016; 9(2):106-17. URL: http://edcbmj.ir/article-1-1039-en.html.

53. Bigdeli S, Pakpour V, Aalaa M, Shekarabi R, Sanjari M, Haghani H, Mehrdad N. Clinical learning environments (actual and expected): perceptions of Iran University of Medical Sciences nursing students. Med J Islam Repub Iran. 2015 Feb 4;29:173. PMID: 26034726; PMCID: PMC4431426.

54. Frenk J, Chen LC, Chandran L, Groff EOH, King R, Meleis A, Fineberg HV. Challenges and opportunities for educating health professionals after the COVID-19 pandemic. Lancet. 2022 Oct 29;400(10362):1539-1556. doi: 10.1016/S0140-6736(22)02092-X.

55. Ahmed, Y., Taha, M. Hasan, Khayal, S. Integrating Research and Teaching in Medical Education: Challenges, Strategies, and Implications for Healthcare. Journal of Advances in Medical Education & Professionalism, 2024; 12(1): 1-7. doi: 10.30476/jamp.2023.99751.1854.

56. Hazrati H, Nojomi M, Vahedi L. Situational analysis of clinical education at teaching hospitals based on the standards of the Ministry of Health and Medical Education in Iran University of Medical Sciences, 2024; pages: 1-19. doi: https://doi.org/10.21203/rs.3.rs-5480409/v1.

57. Safabakhsh L, Atashpanjeh A, Moulaei N, Ayubi E, Chahabdar Z. Medical Students' Clinical Skills Compared to Educational Standards at Universities of Medical Sciences: A Self-assessment Study.Zahedan J Res Med Sci.2022;24(4):e127526.https://doi.org/10.5812/zjrms-127526.

58. Majidi, F., Karimi Moonaghi, H., Makarem, A., Emadzadeh, A., Majidi, N. What Are the Best Strategies for Faculty Development in Medical Schools?. Future of Medical Education Journal, 2018; 8(2): 21-7. doi: 10.22038/fmej.2018.25452.1163.

59. Mohammadimehr M, Haji J. Identifying the factors affecting on interaction of faculty member: A meta-synthesis. J Educ Health Promot. 2022 Oct 31;11:343. doi: 10.4103/jehp.jehp_1602_21.

60. Kumar A, Atwa H, Shehata M, Al Ansari A, Deifalla A. Faculty development programmes in medical education in the Eastern Mediterranean Region: a systematic review. East Mediterr Health J. 2022 May 29;28(5):362-380. doi: 10.26719/emhj.22.014. PMID: 35670441.

61. Davis S, Duane B, Loxley A, Quigley D. The evaluation of an evidence-based model of feedback implemented on an undergraduate dental clinical learning environment. BMC Med Educ. 2022 Aug 1;22(1):588. doi: 10.1186/s12909-022-03630-1. PMID: 35915499; PMCID: PMC9341118.

62. Dev MDB, Rusli KDB, McKenna L, Lau ST, Liaw SY. Academic-practice collaboration

in clinical education: A qualitative study of academic educator and clinical preceptor views. Nurs Health Sci. 2020 Dec;22(4):1131-1138. doi: 10.1111/nhs.12782. Epub 2020 Oct 28. PMID: 33006238.

63. Puppe J, Neal AR. Enhancing communication in clinical nursing education. Nursing. 2014 Oct;44(10):1-5. doi: 10.1097/01.NURSE.0000453719.54875.3a. PMID: 25232970.

64. Marshall S, Harrison J, Flanagan B. The teaching of a structured tool improves the clarity and content of interprofessional clinical communication. Qual Saf Health Care. 2009 Apr;18(2):137-40. doi: 10.1136/qshc.2007.025247. PMID: 19342529.

65. Bleakley, A. Medical Humanities and Medical Education: How the Medical Humanities Can Shape Better Doctors. New York: Routledge, 2015. https://doi.org/10.1111/medu.13236.

66. Farsi, Z., Nasiri, M., Sajadi, S.A. *et al.* Comparison of Iran's nursing education with developed and developing countries: a review on descriptive-comparative studies. BMC Nurs, 2022; 21:105. https://doi.org/10.1186/s12912-022-00861-x.

67. Zandi, M., Ebrahimi, H. & Ghanei Gheshlagh, R. Assessing educational gaps in Iran's nursing education system: a mixed-method approach to the infectious diseases curriculum. BMC Med Educ, 2025; 25:715. https://doi.org/10.1186/s12909-025-07311-7.

68. Asadizaker M, rokhafroz D, sayadi N, Cheraghbeigi N. A comparative study between the Iranian Nursing PhD curriculum and the American Duke School of Nursing. SJNMP 2021;6(3):1-24. http://sjnmp.muk.ac.ir/article-1-353-en.html.

69. Eghbali, T., Sarkoohi Jabalbarezi, Z., Nouhi, E. Factors Affecting Clinical Education Standards in Nursing in Iran: A Systematic Review. Strides in Development of Medical Education, 2024; 21(1): 70-80. doi: 10.22062/sdme.2024.199191.1307.

70. Frank JR, Snell LS, Cate OT, Holmboe ES, Carraccio C, Swing SR, Harris P, Glasgow NJ, Campbell C, Dath D, Harden RM, Iobst W, Long DM, Mungroo R, Richardson DL, Sherbino J, Silver I, Taber S, Talbot M, Harris KA. Competency-based medical education: theory to practice. Med Teach. 2010;32(8):638-45. doi: 10.3109/0142159X.2010.501190.

71. Cooney R, Chan TM, Gottlieb M, Abraham M, Alden S, Mongelluzzo J, Pasirstein M, Sherbino J. Academic Primer Series: Key Papers About Competency-Based Medical Education. West J Emerg Med. 2017 Jun;18(4):713-720. doi: 10.5811/westjem.2017.3.33409. Epub 2017 May 1. PMID: 28611893; PMCID: PMC5468078.

72. Holmboe ES, Sherbino J, Long DM, Swing SR, Frank JR. The role of assessment in competency-based medical education. Med Teach. 2010;32(8):676-82. doi: 10.3109/0142159X.2010.500704.

73. Knight AW. How Clinical Instructor Behavior Affects Student Clinical Engagement from a Motivational Perspective. J Nucl Med Technol. 2018 Jun;46(2):99-106. doi: 10.2967/jnmt.118.209320.

74. Steinert Y, Mann K, Anderson B, Barnett BM, Centeno A, Naismith L, et al. A systematic review of faculty development initiatives designed to enhance teaching effectiveness: A 10-year update: BEME Guide No. 40. Med Teach. 2016 Aug;38(8):769-86. doi: 10.1080/0142159X.2016.1181851.

75. Chaou CH, Yu SR, Chang YC, Ma SD, Tseng HM, Hsieh MJ, et al. The evolution of medical students' preparedness for clinical practice during the transition of graduation: a longitudinal study from the undergraduate to postgraduate periods. BMC Med Educ. 2021 May 6;21(1):260. doi: 10.1186/s12909-021-02679-8.

76. Bosch, J., Maaz, A., Hitzblech, T, et al. Medical students' preparedness for professional activities in early clerkships. BMC Med Educ 2017;17: 140. https://doi.org/10.1186/s12909-017-0971-7.

77. Wazir, M. N. Addressing the Decline in Clinical Skills: A Call for Comprehensive Educational Reform. Journal of Gandhara Medical and Dental Science, 2024;11(3):1–2. https://doi.org/10.37762/jgmds.11-3.609.

78. Committee on Diagnostic Error in Health Care; Board on Health Care Services; Institute

of Medicine; The National Academies of Sciences, Engineering, and Medicine. Improving Diagnosis in Health Care. Balogh EP, Miller BT, Ball JR, editors. Washington (DC): National Academies Press (US); 2015 Dec 29. PMID: 26803862.

79. Haghani F, Kamal F. Look at the Clinical Skills Center and Its Applications. Iranian Journal of Medical Education 2011;10(5):1068-1076.

80. Davoudi Monfared E. Sjadii F. Competency-based medical education and meta-competencies in general physician. Educ Strategy Med Sci. 2017; 9(6):471-74. http://edcbmj.ir/article-1-1156-en.html.

81. Aloosh M. Competency-Based Medical Education: A Requirement for Training “Better Physicians”. Acta Med Iran. 2018;56(8):554-55.

82. Straus, S.E., Glasziou, P., Richardson, W.S. and Haynes, R.B. Evidence-Based Medicine: How to Practice and Teach EBM, 5th Edition. Elsevier, Edinburgh, London, New York, Oxford, Philadelphia, St. Louis, Sydney, 2019.

83. Hemmati maslakpak M, khalilzadeh H. Nursing Students’ Perspectives on Effective Clinical Education: A Qualitative Study. Iranian Journal of Medical Education 2012; 11(7):718-27. http://ijme.mui.ac.ir/article-1-1460-en.html.

84. Vagharseyyedin, S. A., Sabeghi, H. Transition to the Faculty Role: A Qualitative Study into the Experiences of Nursing Faculty. Journal of Advances in Medical Education & Professionalism, 2025; 13(1): 59-66. doi: 10.30476/jamp.2024.103841.2028.

85. Zakerimoghadam M, Yazdanparast E, Hosseiny S F, Ahmadi Chenari H. A Review of New Methods Assessment in Clinical Education of Medical Science Students. Educ Strategy Med Sci 2021; 14(3):92-102. URL: http://edcbmj.ir/article-1-2414-en.html.

86. Moharami N, Shakour M. Evaluation of Clinical Course Assessment of Medical Students in Virtual Education. Res Med Edu 2024; 16(2):33-43. URL: http://rme.gums.ac.ir/article-1-1364-en.html.

87. Hobenu KA, Adefuye AO, Naab F, Nyoni CN. Strategies to enhance clinical teaching and learning in undergraduate nursing education: A scoping review. PLoS One. 2025 Jun 10;20(6):e0305789. doi: 10.1371/journal.pone.0305789. PMID: 40493639; PMCID: PMC12151355.

88. Ellaway RH, Chou CL, Kalet AL. Situating Remediation: Accommodating Success and Failure in Medical Education Systems. Acad Med. 2018 Mar;93(3):391-398. doi: 10.1097/ACM.0000000000001855. PMID: 28767496.

89. Flood LS, Robinia K. Bridging the gap: strategies to integrate classroom and clinical learning. Nurse Educ Pract. 2014 Aug;14(4):329-32. doi: 10.1016/j.nepr.2014.02.002. Epub 2014 Feb 12. PMID: 24674949.

90. Akram Abu Salah, Mohamad Aljerjawy, Akram Salama. Gap between Theory and Practice in the Nursing Education: the Role of Clinical Setting. JOJ Nurse Health Care 2018;7(2): JOJNHC.MS.ID.555707.