Original Article

Challenges in applying theoretical knowledge from the general medicine course in clinical practice: A qualitative study

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Abstract

Background & Objective: Clinical education stands as a critical domain for enhancing clinical skills. Evolving global demands, marked by an information explosion and dynamic shifts in disease patterns, coupled with deficiencies in clinical training and its disconnect from theoretical knowledge, pose significant challenges in patient care. This study aims to explore the obstacles and challenges associated with applying theoretical knowledge from the general medicine course in clinical practice.

Materials & Methods: This qualitative research employed a conventional content analysis approach. Twenty participants, each with a minimum of one year of clinical education experience, were purposefully selected to ensure maximum diversity. Data were collected and analyzed through individual semi-structured interviews.

Results: The data analysis identified five main categories as the primary challenges in applying theoretical knowledge in the clinical environment. These include "weakness of inputs," "weakness of policy," "ineffective training and novice practitioners," "ethical lapses, unprofessional conduct," and "challenges while studying." Additionally, 14 subcategories were derived, collectively representing the main challenges faced.

Conclusion: The application of theoretical knowledge acquired in various aspects of clinical education is hampered by diverse challenges. These challenges manifest at different levels, encompassing management, policy, infrastructure, and human and material resources. Prioritizing identified issues and implementing corrective actions based on existing capacities is the initial step in overcoming these challenges.

Keywords: clinical education, theoretical knowledge, general medicine

Introduction

The primary mandate of any country's education system is to cultivate dedicated and specialized human resources to serve its populace (1). Medical science universities align with this objective, emphasizing the acquisition of practical-communication skills alongside theoretical-cognitive knowledge. Within this context, clinical education emerges as a pivotal force in molding the professional capacities of students (2). Internships and clinical rotations constitute essential components of clinical education, facilitating the practical application of theoretically acquired concepts through interactions with professors and patients (3).

Attaining proficiency in clinical skills demands a conducive platform (4) and necessitates sustained training, time investment, and patience (5). Effective clinical experiences empower students to seamlessly implement theoretical principles within a clinical environment. Any impediment in clinical education compromises its efficiency and efficacy (6).

Studies reveal that medical students and graduates often perceive gaps in their medical skills and capabilities (3, 7, 8). Various challenges in medical education, both sudden and persistent, further compound these concerns (9). The evolving landscape of healthcare, marked by information explosions, changes in disease patterns, and technological advancements, necessitates a reevaluation of educational methods (10). Challenges hindering the application of theoretical knowledge in hospital settings

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include the unresponsiveness of medical education programs to societal health needs, a lack of incentives for effective educational development, and substantial time consumption in non-educational medical activities (11).

The primary concern addressed in this research is the gap between theory and practice, hindering the transfer and application of theoretical knowledge in clinical situations. This lack of coordination poses a significant challenge in aligning what is learned in the classroom with its practical application in the clinic. A study on "Challenges of General Medical Education" highlights inadequacies in educational content, insufficient rotation time, non-standardized assessments, weaknesses in virtual education, theoretical-practical education misalignment, and teaching method deficiencies (1).

Similar challenges are observed across disciplines with clinical training, as evident in studies on nursing students. These challenges encompass students' lack of interest and motivation, instructor inefficiency, limitations in clinical facilities, and discrepancies between theoretical and clinical education (12-17).

Given the centrality of the clinical environment for all medical students, it serves as a nexus for connecting theoretical studies with practical applications, enabling self-assessment and skill enhancement (1, 8). The existing gap between theoretical and practical knowledge has repercussions on healthcare provision, exposing graduates to criticism for lacking sufficient practical capabilities despite strong theoretical foundations (17). Addressing these challenges and elevating the standard of medical education requires efficient feedback mechanisms, continuous revisions, and the elimination of shortcomings. Students, as recipients of educational services, offer valuable insights into the deficiencies of the educational system, making their perspectives pivotal in assessing the quality of clinical education (12).

Despite numerous quantitative studies investigating clinical education challenges, aspects of this field remain unknown and unclear. This research aims to bridge this gap by providing a socio-culturally grounded exploration of the obstacles and challenges in applying theoretically acquired knowledge in clinical settings for medical students.

Materials & Methods

Design and setting(s)

This research adopts an exploratory qualitative study design, employing a conventional content analysis approach. The study was conducted from September 2021 to January 1401 at Isfahan Medical School, Isfahan Iran.

Participants and sampling

The participants consisted of medical students from Isfahan Medical School. Purposeful sampling was employed, initially involving 12 face-to-face interviews until saturation was achieved, and no new codes emerged. To enhance study accuracy, an additional eight questionnaires were administered. Inclusion criteria required participants to have completed at least one year of the clinical course and willingly participate in the study (Table 1).

Table1. Demographic characteristics of study participants

Participant Number	*Gender*	*Marital Status*	*Residence*	*Semester*	*Total GPA**	*Social-Economic Level*
1	Male	Single	Dormitory	11	17	Good
2	Male	Single	Dormitory	13	17.7	Good
3	Male	Single	Personal	12	16.3	Good
4	Male	Single	Personal	13	18.2	Average
5	Male	Single	Personal	12	17.1	Good
6	Female	Single	Personal	14	17.4	Average
7	Male	Single	Dormitory	13	15.4	Average
8	Male	Single	Personal	13	16.3	Average
9	Female	Single	Dormitory	13	16.9	Excellent
10	Male	Married	Dormitory	13	18.7	Average
11	Female	Single	Personal	14	17.1	Average
12	Female	Single	Personal	13	17.5	Good
13	Female	Single	Personal	13	15.2	Good
14	Male	Single	Dormitory	12	16.3	Average
15	Male	Single	Dormitory	13	15.7	Average
16	Male	Married	Dormitory	13	15.1	Average
17	Male	Single	Dormitory	12	16.4	Good
18	Male	Single	Personal	13	16.7	Average
19	Male	Single	Personal	13	16.2	Average
20	Male	Single	Personal	14	17.2	Average

Abbreviations: GPA, grade point average

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Tools/Instruments

A prepared guide, encompassing the study's title, purpose, a necessity summary, and relevant questions, was provided to participants before interviews to familiarize them with the study. Questions included inquiries about a typical day during their internship, positive and negative experiences in the clinical course, difficulties in applying clinical skills at the patient's bedside, and situations where a gap between learned knowledge and real-world application was perceived. Additionally, open-ended and exploratory questions were employed for in-depth insights.

Data collection methods

Individual, face-to-face, and semi-structured interviews were conducted to collect information. A prepared guide, encompassing the study's title, purpose, a necessity summary, and relevant questions, was provided to participants before interviews to familiarize them with the study. Questions included inquiries about a typical day during their internship, positive and negative experiences in the clinical course, difficulties in applying clinical skills at the patient's bedside, and situations where a gap between learned knowledge and real-world application was perceived. Additionally, open-ended and exploratory questions were employed for in-depth insights.

Data analysis

Conventional content analysis, following the steps proposed by Zhang and Wildmuth (22), was utilized. The researcher read each interview text multiple times to comprehend the underlying concepts. Subsequently, data were transformed into codes or semantic units, with continuous comparison, evaluation, feedback, and interpretation employed to summarize codes into subcategories and categories. An illustrative example of content analysis, coding, subcategory, and category formation is provided in Table 2.

Table2. Inductive process example - consolidating participants' statements into a theme

Participant Number	Participant's Statements	Code	Subtheme	Theme
10	I wonder how I can live with the two million (40$) the university gives me? What else can I do besides buying and selling night shifts? I don't have the concentration left to study.	Financial issues are a cause of reluctance to participate in higher education	Being Consumed by Survival; Demotivation Factor	Challenges While Studying
9	I was in the internal rotation when there was COVID, and there was no educational load at all. We only took the history of COVID. We hardly saw any cases of	COVID-19 is a factor in reducing the educational burden on students at various levels (interns and residents) internal medicine.	COVID-19: Killer of Useful Experiences	
2	As I intend to emigrate, whenever I find time in the hospital, I spend it studying the language (English), and I miss as many classes as possible.	Moving towards assistantship and emigration is equivalent to deviating from clinical education	Emigrating or Participating in the Residency Exam, a Bandit of Education	

Rigor

To ensure data accuracy, criteria proposed by Lincoln and Guba (23) were applied, encompassing credibility, transferability, dependability, and confirmability. The researcher established a long-term relationship with participants to build trust, and the interview text, semantic units, and codes were presented to participants for verification. Maximum diversity in participant selection was pursued based on experience, semester, and gender. An external observer with a doctoral background in medical education and qualitative research experience reviewed interviews, initial coding, and thems, resolving discrepancies through team discussion. The research process and characteristics of the study population were meticulously described to facilitate data transferability. Data validation was achieved by avoiding biases, precisely documenting the research process, and seeking external validation.

Results

In this study, a final count of 872 initial codes, 14 subcategories, and five main categories were extracted. The following section briefly explains each .

1- Input Weakness:

a) Non-adherence of Teaching and Treatment Staff to Described Duties: Many participating students expressed concerns about teaching and treatment staff deviating from assigned duties. They highlighted instances where duties overlapped, and interns found themselves performing tasks beyond their designated roles, such as collecting urine samples or taking patients for CT scans. Participant 17 noted, "Many times it happens that I have to collect even the patient's urine sample in the middle of the shift, take it to the patient's bed and take it for a CT scan." (p: 17) Another participant said: "In the two weeks we were in the orthopedic ward, we did not see the professor even once in the rounds." (p: 2)

b) Lack of manpower, high work pressure: The fatigue experienced by students diminishes both efficiency and

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motivation. The shortage of manpower results in an increased number of duties for interns and residents, adversely affecting the quality of services, documentation, and treatment follow-up. Moreover, education takes a back seat as it is no longer a priority for interns and residents. Participant 7 vividly expressed this sentiment, stating: "In some night shifts, we don't close our eyelids/do not sleep at all. If it was for training, we wouldn't be upset and nervous, but it's just like treating a patient, including file-writing and... And it's not educational. It makes us tired. So that we miss tomorrow because we just sleep." (p: 7)

2- Weakness of Policy Making:

a) General Practitioner, the Forgotten Output: Interviewees expressed the belief that current educational policies fail to adequately train competent general practitioners. They attribute this to the immersion of students in specialized environments, where training is provided by specialized professors and interactions involve primarily specialized patients from basic treatment centers like clinics and hospitals. The neglect of patient education is deemed common and simplified. Participant 6 articulated this concern, stating, "When the hospital where I train is specialized, I don't learn anything suitable for a general practitioner." (p: 6)

b) Ineffectiveness of the Evaluation, the factor of accumulation of defects: According to the findings, the evaluation of both individuals and infrastructure is weak. The failure to identify and address the system's weaknesses results in a continuous addition of new defects over time, creating a vicious cycle that ultimately leads to the accumulation of system defects. A notable example is the inefficiency in evaluating and managing a professor with unprofessional behavior and limited knowledge, which has resulted in the continued presence of this individual in the system. Consequently, every month, a number of students under the training of this person leave the ward and hospital without acquiring the necessary knowledge.

Additionally, the inefficiency of the hospitals' accreditation system is evident, illustrated by the medical student dormitory in an educational hospital in Isfahan having only eight beds for interns. This inadequacy becomes apparent when considering that there are consistently more than 15 male and female interns on duty every night. Consequently, a considerable number of individuals are left without a bed, impacting their ability to rest adequately. Participant 3 emphasized this issue, stating: "Frequent evaluation can solve the problems of the system, but even in some hospitals, we have a problem with water in the toilet, which is cut off... On the other hand, the quality of the food is very bad. Sometimes we have 4 meals of omelette (with vigitables) in a week. Well, if the evaluation system is correct, it would be possible to fix the defect." (p: 3)

c) Not Education, but Treatment; Health System Priority: Amidst successive waves of the coronavirus disease, where the need for a centralized facility for hospitalization and patient treatment was paramount, teaching hospitals emerged as the sole available options. Therefore, in a teaching hospital, all medical responsibilities, ranging from documenting medical histories to dispensing medications, handling discharges, and even performing some surgeries, rest on the shoulders of the students and assistants present during the night shift. It is crucial to acknowledge that, in such critical conditions, the emergency departments and critical care units are often inundated with numerous patients, each with diverse and pressing needs. There are instances where more than twenty patients are admitted to a hospital ward, and the responsibility for their treatment falls upon the interns and residents.

Moreover, at times, a resident or intern may work fifteen night shifts per month at the hospital, foregoing rest throughout the night to attend to patients. This is particularly true when there is no teacher available during the night shift for training. The high workload not only prevents students from having sufficient time to read textbooks but also deprives them of a teacher from whom to learn. Participant 9 poignantly expressed this reality, stating: "Really, the intern is only known as a force that writes and does not know anything... In the treatment process, we are only responsible for writing the file, we only need to complete the file, well, file writing is the most difficult and time-consuming task of the ward " (p: 9)

3- Ineffective Training and Novice Practitioners

a) Chest-to-Chest Training Instead of Evidence-Based Training: The training paradigm often involves rote learning rather than evidence-based methodologies. When interns are questioned about their choice of a specific drug and dosage for disease management, the common response is reliance on the teacher's directive. Unfortunately, the medical curriculum tends to lack emphasis on scientific methodologies, primarily conveying information as authoritative statements from professors. There is a noticeable deficiency in training on how to search for and utilize current, reliable information to address clinical queries—a practice commonly known as evidence-based medicine. Participant 11 expresses the

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view that, "The professor usually considers himself a know-it-all and relies on his opinion instead of consulting or searching... We have guidelines for treating patients, while some often take actions against the guidelines and then justify it with their own experience." (p: 11)

b) Non-participation of the Intern in the Treatment Process: Acquiring medical skills necessitates extensive practice, and merely being present in the hospital does not equate to effective practice. Allowing interns to actively engage in the treatment process, particularly in tasks such as writing medical orders under the supervision of professors and residents, is essential for meaningful training, repetition, and skill development. Participant 12 underscores the significance of hands-on experience, noting, "The emergency room was the best rotation because it did not have a resident, and the responsibility of treating the patient was on our shoulders." (p: 12)

c) Case-based Resources: The Missing Link of Education: The current focus on disease-oriented pathophysiology courses lacks alignment with the practical needs of effective medicine. What students require is symptom-oriented education. Patients typically present with symptoms rather than a specific diagnosis, emphasizing the need for doctors to approach complaints systematically. Participant 15 proposes a solution, stating: "For clinical skills, first, a case-based booklet that includes scientific requirements should be available to us as a guideline to help practical learning, then a supplemental part; To do it is a skill. It complements knowledge and completes learning." (p: 15)

d) Inapplicability of the Content: The content of the pathophysiology course often encompasses the entirety of a disease, including aspects ranging from genetics and histology to physiology and pathology. This broad coverage extends from conditions commonly encountered by a general practitioner (such as otitis media) to those that a general practitioner may never encounter (such as a kidney transplant patient with decreased urine volume). Participant 14 advocates for a more focused curriculum, stating: "In classes, time is sometimes spent on really unimportant or unessential issues... unessential because we don't need a lot of specialized material with a lot of details to become a general practitioner." Participant 14 continues, "For example, the BRCA gene is effective in breast cancer. This point does not help me in the management of this disease because the treatment of breast cancer has no place in the description of duties of a general practitioner." (p: 14)

4- Ethical Lapses, Unprofessional Conduct:

a) Emotional Communication Gap Between Professor and Student: There exists a significant emotional communication gap between professors and students within educational centers. The elevated status and perceived holiness of professors create a barrier that hinders a closer connection. This weak communication results in deleted conversations, rendering professors unaware of the students' problems, and students distant from the professors' concerns. The lack of a meaningful connection affects both parties, as they remain oblivious to each other's situations. Participant 3 reflects on this, stating: "We are in the midst of a generational change where neither the professors understand us nor we understand the professors." (p: 3)

b) Professional Misbehavior as the Cause of Poor Education and Evasive Students: A critical weakness among the training staff is the tendency to treat interns as colleagues. This approach fosters a one-sided and subordinate view of interns, leading to professional misconduct, including humiliating interns at the patient's bedside when questioned by professors. This detrimental behavior significantly contributes to students avoiding their teachers. Moreover, such behavior extends to a lack of empathy towards patients, further impacting the quality of intern training. Participant 20 emphasizes the importance of respectful conduct, stating: "The intern and even the resident should not be insulted at the patient's bedside because it makes them lose their self-confidence, and on the other hand, they learn to misbehave." (p: 20)

5- Challenges While Studying:

a) Being Consumed by Survival; Demotivation Factor: Interns, typically at least twenty-four years old, find themselves in pursuit of financial independence. The struggle to meet basic needs becomes all-consuming, diverting their attention from academic pursuits. Engaging in economic activities, such as buying night shifts, writing essays, or working in an internet taxi, becomes a necessity for financial survival. This preoccupation with basic survival needs contributes to a lack of motivation to attend educational courses. Participant 10 articulates this struggle, stating: "How should I live with the two million rials (40$) that the university gives me? What else can I do besides buying and selling night shifts? I don't have the concentration left to study on that account, to read." (p: 10)

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b) COVID-19: Killer of Useful Experiences: Over the last two years, the internship and physiopathology classes were suspended due to the ongoing Corona pandemic. This disruption prevented students from gaining essential experiences such as communicating with patients and the treatment staff, managing stress, understanding the operational methods of taking history and physical examinations, and acquiring various skills before entering the internship. This deficiency resulted in students entering the internship unprepared and lacking practical experience. Even during the internship, the impact persisted, with interns experiencing a one to two-month holiday. These circumstances posed a significant obstacle to quality education. Participant 9 illustrates the consequences, stating: "I was in the rotation of the internal medicine ward when there was Covid, and there was no teaching load at all. We only took the history of the Covid. We hardly saw any cases of internal medicine." (p: 9)

c) Emigrating or Participating in the Residency Exam, a Bandit of Education: A considerable number of general medical students are contemplating either emigrating from the country or participating in the residency exam due to the perceived uncertainty of their future prospects. This inclination leads them to divert completely from the path of general medical education. These individuals, often through financial incentives, request their classmates to attend night shifts and training rounds on their behalf. Consequently, they actively avoid hospital attendance, contributing to a reduction in the clinical experience of this group. Participant 2 shares this perspective, stating: "My intention is to emigrate, and whenever I find time in the hospital, I spend studying the language (English) and miss as many classes as possible." (p: 2).

Discussion

The aim of this study was to explor the challenges faced by clinical medicine students in applying theoretical knowledge in the clinical setting. Utilizing a qualitative approach and content analysis method, several key challenges were identified, including "weakness of inputs," "weakness of policy," "ineffective training and novice practitioners," "ethical lapses, unprofessional conduct," and "challenges while studying."

Among the challenges highlighted, the shortage of manpower and high work pressure emerged as a significant hurdle. The increased number of night shifts, coupled with the heavy workload during each shift, not only weakened students' capabilities but also left minimal time for effective training. The exhaustion endured after a shift further hindered any post-shift learning opportunities. Additionally, the scarcity of study opportunities contributed to the forgetting of scientific materials and a decreased application of theoretical knowledge at the bedside.

A study by Kouhnavard and colleagues (24) supports these findings, suggesting that enhancing parameters related to occupational stress and mental workload could potentially improve job performance. This improvement may lead to increased satisfaction, intrinsic motivation, creativity, and a sense of responsibility among personnel. The correlation between high workload, exhaustion, and reduced utilization of theoretical materials underscores the need for interventions that address these challenges, ultimately enhancing the learning experience and performance of medical students in the clinical environment.

Another significant challenge involves the impact of macro policies on student education, particularly evident in the subcategory of "ineffective training and novice practitioners". This challenge manifests when general medicine students undergo their internships in specialized hospitals with specialized professors, cases, and training. While this approach exposes students to rare diseases and in-depth knowledge, it distorts the primary objective of education, which is to produce competent general practitioners. Consequently, students may possess extensive information about uncommon ailments but lack fundamental knowledge about prevalent and straightforward cases.

A study conducted by Densen and colleagues aligns with these findings, emphasizing the inadequacy of the proper distribution of theoretical training in medical education. This lack of balance can lead to confusion among students (25). Moreover, the inefficiency of the evaluation system, encompassing teacher, student, and institution evaluations, serves as a contributing factor to the accumulation of numerous defects. This aligns with findings from previous studies, underscoring the critical importance of an effective evaluation system in medical education (17).

The next challenge is the priority of treatment over education. General medical education in Iran is simultaneous with treatment and doing all the administrative (writtings), service and treatment work of patients. Therefore, the deadline given to students for examining each patient in the hospital has been reduced and this little time is spent doing things that are not useful for students to learn. The high rate of hospitalized

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patients has led to a decrease in the time spent discussing each patient's bed, in addition, due to the rate of hospitalized patients, the training time of the outpatient department is also less than the time required by each student (18). Students admited that the lack of evidence-based education has caused a decrease in treatment based on current and scientific protocols/guidelines. This has caused the lack of standard training and increased medical errors. Marashi Hosseini and colleagues came to the conclusion that only 5.65% of assistants were familiar with evidence-based medicine and only 1.42% of them treat their patients with this method (26).

Another notable challenge is the inadequacy of resources based on diverse cases during internships. Many professors continue to teach internship content focused on diseases, neglecting the essential skill of diagnosing based on patients' signs and symptoms. This gap hampers the effectiveness of scientific materials at the bedside, hindering students' ability to connect theoretical knowledge with practical application. Heydari and colleagues underscore the importance of aligning educational content with the actual needs of future general practitioners. They identify this mismatch as a significant factor contributing to the overall low quality of education in this field (1).

Moreover, the issue extends to professors prioritizing less crucial subjects. Despite the existence of "certain lesson plans" and the establishment of "educational objectives of class meetings" by educational groups, some professors deviate from these guidelines based on personal preferences. Students, lacking a mechanism to voice their concerns, often accept this deviation. Lesson plans and objectives are accessible through educational group websites, but student engagement with these resources remains minimal.

A previous study indicates that implementing strategies such as clearly stating expectations, outlining curricular and practical goals, providing feedback mechanisms, and dedicating the first session of the course for orientation can significantly enhance the quality of education (4).

An additional critical concern highlighted by participants is the unprofessional ethics exhibited by teaching and treatment staff, contributing to the development of unprofessional behavior among medical practitioners. The age and social disparities, coupled with distinct educational styles and personalities, have led to a significant emotional-communicative gap between professors and students. This gap, a breeding ground for mutual ignorance of each other's challenges, obstructs the development of understanding and exacerbates relational friction. Constructive communication has been identified as a pivotal factor in understanding the scientific needs of students, empowering professors to select appropriate course content (17).

Vertical violence, a prevalent issue in medical education, necessitates the development of ethical curricula and transparent handling policies for resolution (27).

The final category of challenges, as perceived by participants, revolves around the struggles encountered while studying. Students grapple with significant hurdles related to daily life necessities, compelling them to seek opportunities in non-academic domains to fulfill their needs. Striking a delicate balance between employment and academic pursuits, ensuring both economic sustenance and optimal utilization of educational opportunities, emerges as a formidable challenge for students, as identified in previous research (28).

The advent of the COVID-19 pandemic further intensified the educational landscape's complexity. Prolonged closures of clinical rotations and brief interruptions for interns altered the spectrum of patients admitted to hospitals. Studies indicate that COVID-19 induced a transformative challenge, influencing patient demographics and hospital routines (29).

The concluding challenge involves the pivotal decisions of residency pursuits or migration, acting as potential disruptors to the quality of clinical education in general medicine, according to the participants. A study conducted in Iran in 1998 revealed that 91.7% of final-year medical students expressed a desire to specialize. However, the lack of alignment between students' inclinations toward specific fields and societal needs underscores a critical mismatch (30).

While this research provides valuable insights into the challenges faced by medical students, it is essential to acknowledge its limitations. The qualitative nature of the study, reliant on participants' perspectives, may introduce subjectivity. Additionally, the study's scope might not fully capture the diversity of challenges experienced across different medical education settings. Moreover, the research focuses on a specific geographical context, and the identified challenges may not be universally applicable. Different healthcare systems, cultural contexts, and educational structures could influence the nature and intensity of challenges faced by medical students

Conclusion

In conclusion, the challenges outlined by participants shed light on critical areas in medical education that

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demand immediate attention. The multifaceted nature of these challenges, encompassing manpower issues, policy inefficiencies, training deficiencies, ethical lapses, and study-related obstacles, underscores the need for a comprehensive approach to enhance the adaptability and resilience of medical education. Addressing the manpower challenge involves not only increasing resources but also reconsidering the distribution of responsibilities during shifts. Policy improvements, particularly in evaluating and rectifying system weaknesses, are pivotal to preventing the accumulation of defects. Furthermore, refining training methodologies, incorporating evidence-based practices, and encouraging active participation in the treatment process can contribute to producing more competent practitioners. Ethical considerations and professionalism are cornerstones in bridging the communication gap between professors and students. Fostering constructive communication and eliminating professional misbehavior are essential steps toward creating an environment conducive to effective learning. The challenges related to studying, whether driven by economic pressures or external factors like the COVID-19 pandemic, highlight the necessity of flexibility in medical education. Striking a balance between work and study, adapting to changing circumstances, and accommodating the evolving needs of students are crucial aspects that require ongoing attention.

Ethical considerations

This study adhered to the ethical principles outlined in the Declaration of Helsinki. Prior to commencement, approval was obtained from the Ethics Committee of Isfahan University of Medical Sciences (IR.MUI.RESEARCH.REC.1400.061). Full confidentiality of research data was assured. All participants received detailed information regarding the study's objectives and significance, and they joined the research voluntarily after providing both written and oral consent. Participants were explicitly informed of their right to withdraw from the study at any point.

Artificial intelligence utilization for article writing

No.

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Conflict of interest statement

The authors report no actual or potential conflict of interest.

Author contributions

All the authors participated in the process of the initial writing of the manuscript, its revision, presentation of the idea and initial design, and collection and analysis of data. Moreover, all authors accept the responsibility for the accuracy and correctness of the contents of the present manuscript and approve the final version of the manuscript.

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Data availability statement

All information is available in the article.

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