How Did the COVID-19 Pandemic Affect the Clinical Skills and Competencies Among New General Physicians: A Qualitative Study

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Abstract

Background: Amidst the COVID-19 crisis, many new general physicians who were medical interns during the pandemic were deprived of clinical rotations, new learning situations, and educational opportunities. This situation has resulted in a lack of confidence in graduates for fulfilling their duties as physicians.

Objectives: This study was designed to investigate the clinical education challenges of New General Physicians who were medical interns (Sixth and Seventh-year medical students) during the COVID-19 pandemic.

Methods: This qualitative conventional content analysis study was conducted from November 2022 to February 2023in Iran. Data were collected using semi-structured in-depth interviews to understand the educational challenges of medical graduates during covid-19 pandemic. Seventeen purposefully retrieved and participated in the study. After data saturation, analysis was performed using Graneheim and Lundman's approach (2004).

Results: The data analysis from interview coding led to the extraction of two main categories: Ineffective Clinical Education and Inadequate Outcome, with seven subcategories including Poor management clinical education planning, clinical resource restriction, online learning pitfalls, skills, attitude and knowledge needs, and deficiency in professional interactions.

Conclusion: The results showed that the crisis caused by the COVID-19 pandemic had a serious impact on achieving the desired competence of new general physicians who completed part of their clinical training during that period. Therefore, attention and planning through continuing medical education (CME) is essential.

Keywords: Clinical; Skills; Clinical Competency; COVID-19; New General Physicians

Background

The emergence of the COVID-19 pandemic has created significant challenges in the world (1). This pandemic had a profound impact not only on the health and treatment systems but also on higher education and teaching (2-4). Different countries had different responses to the COVID-19 pandemic, ranging from complete university lockdowns to the early graduation and employment of students as staff (5). The Association of American Medical Colleges recommended in March 2020 the "immediate suspension of medical students' involvement in any activities that involve patient contact." because medical students are not only at risk but also can potentially serve as carriers due to their repeated rotations and contact with healthcare staff and patients (6). This interruption in clinical education could result in a lack of competency in graduate students (7). In Iran, like other countries, changes were made in the education of medical students, especially final-year medical students, such as the suspension of clinical rotation in the clinical internship period or a significant reduction in the hour's students attend the hospital (2, 8). These changes will definitely have consequences. A study conducted by Choi et al. in 2020 showed that the

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impact of COVID-19 on the education of senior-year medical students in Britain has been significant. Most students were unprepared to begin working as physicians. The results of this study showed that educational disruptions during the last two years of the study significantly affected their preparedness (5). Ferrel et al. (2020) also suggested that the cancellation of internships, which are essential both for acquiring skills and establishing relationships, is a serious issue faced by students and medical faculties. Many medical students have lost the opportunity for personal growth through conference presentations, which could inflict serious damage on their career paths (9). During the SARS outbreak in 2004, 60% of residents believed that the cancellation of educational activities or fundamental clinical rotations put their education at risk (10). Kumar and colleagues (2022) revealed that all stakeholders are concerned about attaining credentials by medical students amidst the COVID-19 pandemic and the subsequent impact on future Indian Medical Graduates (IMG). This study also highlights the deprivation experienced by medical students during the health crisis, wherein they were not only restricted from gaining clinical experience but also from engaging in social interactions within genuine clinical environments utilizing the learner-physician clinical education approach (11). Therefore, identifying and considering opportunities to improve the experience and performance of medical students as future physicians is essential.

Objectives

The purpose of this study was to understand the clinical education challenges of new general physicians who were medical interns (Sixth and Seventh-year medical students) during the COVID-19 pandemic.

Methods

Study design: The current qualitative study was conducted using the conventional content analysis approach to identify the clinical education challenges of new general physicians who were medical interns during the COVID-19 pandemic.

Setting: This study was conducted from November 2022 to February 2023 at the hospital and health care center of Bushehr University of Medical Sciences.

Selection of Participants: New general physicians who were medical interns during the COVID-19 pandemic at Bushehr University of Medical Sciences.

Participant inclusion criteria: All General physicians who were medical interns during the COVID-19 pandemic. For all participants the following criteria were met: willingness to participate in the study, having Iranian nationality, and being able to communicate and share their experiences.

Data collection procedure: In this study, we used purposeful sampling with Maximum variation based on essential demographic information and work environments such as age, gender, marital status, and workplace. Data saturation occurred after interview 12 and was continued for up to 5 more people to be sure (12).

Semi-structured and in-depth interviews were used to collect data. To ensure the participant's comfort, their preferences for the time, location, and format of the interviews, (in person or by phone) were considered. The duration of the interviews ranged from 40 to 90 minutes. Interviews were conducted by the first author (BB) from November 2022 to February 2023.

All interviews were recorded using a voice recorder and transcribed verbatim by the researcher immediately after the interviews. The main questions revolved around the educational, knowledge-based, skill-based, and attitudinal needs of the graduating new general physicians during the COVID-19 pandemic. The interviews began with a general question about the impact of COVID-19 on their education and ended with more specific questions. For example: "What was your experience with education in various clinical areas during the COVID-19 pandemic? Did you encounter any challenges in your work environment after graduation that could be attributed to clinical education during the COVID-19 pandemic? To further deepen the findings, probing questions were used. Three interviews were ambiguous, so an additional interview was conducted with them.

After explaining the purpose and methods of the research, permission to record the conversation, and written informed consent were obtained from all participants. Confidentiality was maintained throughout all stages of the study, using codes to refer to participants when reporting findings (Participant: P1, P2, P3, etc.). Additionally, participants were assured that they could withdraw from the study at any time.

Data analysis: The data analysis was conducted using a conventional content analysis approach, following the method of Graneheim and Lundman (13). At the end of each interview, the recorded audio files were meticulously transcribed word by word. The written text

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was studied several times to obtain a general sense of it. Ambiguous items were clarified by recontacting the participants and their explanations were added to the transcriptions. For initial coding, meaningful units from the participants' statements in the form of initial or open codes were extracted from the interviews. The codes were then compared in terms of their conceptual similarities and differences. Similar codes were grouped into categories, and these categories were subsequently combined to form broader categories. By comparing these categories engaging in careful and deep reflection, and synthesizing these categories extracted principal themes. The coding was done manually (Table 1).

Trustworthiness: The Lincoln and Guba criteria were used to ensure the rigor of the data (14). The credibility aspect was achieved through prolonged engagement with the study's subject to ensure an in-depth understanding of the concept and immersion in the data. To increase the confirmability criterion, the initial coding of data (conducted by the first author) was independently reviewed by each research team member, followed by a collective review by all research members. Additionally, two colleagues familiar with the qualitative analysis method who were not part of the research team assessed coded data for the study process. Furthermore, maximum sampling variation increased the data's confirmability and credibility. Finally, a nonparticipating new general physician, reviewed the results to ensure their accuracy, completeness, and consistency of the interpretations with the participant's experiences as well as to confirm correct coding. To achieve the transferability stages of the study, decisions made throughout the process were carefully recorded and reported. Also, during the interview, the researcher followed the principles of open and in-depth interviewing and bracketing.

Decisions made during the process.

Ethical approval: Permission to conduct the present study was obtained from the Ethics Committee of Bushehr University Medical Sciences of (IR.BPUMS.REC.1401.174). Necessary information about the research goals was provided to the participants, and while assuring them of the confidentiality of the collected information, their permission to record the interviews was obtained. Informed consent forms were also obtained from all the participants, and they were reassured that withdrawal from the study would not have any negative consequences for them.

Results

The study involved 17 new general physicians, aged between 25 to 28 years, with a minimum of one month of work experience. The demographic characteristics of the participants are shown in Table 2.

In the process of data analysis, 340 initial codes were extracted.

These codes were categorized into seven subcategories, ultimately resulting in two main categories, Ineffective Clinical Education and Inadequate Outcome (Table 3).

Main Category 1: Ineffective clinical education

Clinical education is crucial in preparing and facilitating the successful transition of medical students into the actual healthcare setting. The COVID-19 pandemic presented a significant challenge to clinical training as clinical rotations were suspended and the patient population in hospitals decreased. One of the main categories mentioned by the new general physician was the inadequacy of clinical education, which includes subcategories, poor management of clinical education planning, clinical resource restriction, and online learning pitfalls.

Poor management of clinical education planning: Due to the COVID-19 pandemic and its sudden waves, clinical rotations were suspended or reduction of clinical rotations for an extensive period, causing distressing impacts. In addition, due to the heavy involvement of professors in the COVID-19 pandemic, clinic training (teaching rounds, morning reports, and outpatient training) was canceled without an alternative program.

In this regard, one of the participants said "*Clinical* rotation training was suspended at the beginning of each wave of the pandemic, which seemed illogical (Participant12).

Another participant, a female general physician with 4 months of work experience said:" We typically received training in the hospital clinic. However, when the clinic was suspended, sometimes the professor allowed us to observe patients alongside him/her in the office. It was very beneficial" (Participant 2).

Clinical resource restriction: Hospital equipment in the hospital is designed to maintain the health of patients and medical staff. During the COVID-19 pandemic, masks and gloves were provided to students to protect their health, but it was not sufficient. Due to reduced clinical rotation times, they couldn't use the resort. In addition, the decrease in the number of hospitalized patients and equipment had an impact on clinical education. "Because we didn't have new masks and gowns, we couldn't take off the masks and gowns, so we couldn't even eat lunch." (Participant 9).

Another participant, a new general physician who worked in the general hospital in this regard stated: "Because most of the patients in the only general teaching hospital were patients with COVID-19, we were on treating COVID-19 patients. Consequently, there were no various cases of other illnesses." (Participant 6).

Online learning pitfalls: While virtual education played a crucial role in addressing the educational void during the COVID-19 pandemic by organizing conferences and morning reports it faced significant challenges, especially in countries like Iran and smaller universities. These challenges included concerns about content effectiveness, unconventional use in clinical courses, limited familiarity with new platforms, decreased internet speed, low-quality files, and inadequate infrastructure.

"Because we could not see the instructor, we could not focus properly in virtual classes, and the internet speed was so low that it kept disconnecting so that I kept falling asleep" (Participant 11).

The other male participant stated:" *The professor's* voice on the slides was so weak that I raised the volume to the end, but I still didn't hear her" (Participant 9).

Main Category 2: Inadequate Outcome

The shortcomings of clinical education and the inability and unpreparedness of the student to function as an independent physician were identified as the main category related to the consequences of clinical education's inadequate outcome, which consisted of four subcategories: skill needs, knowledge needs, attitudinal needs, and deficiencies in professional interactions.

Skill Needs: Achieving clinical competency and essential skills is a necessary condition for a physician to perform independently in a real environment. Shortening or suspension of clinical rotations and allocating clinical departments to COVID-19 patients during the COVID-19 crisis had hindered interns from gaining the necessary skills.

"I really do not have confidence in patient management and am constantly afraid of making a wrong diagnosis" (Participant 4).

"I had a patient with a pea stuck in his nose and I did not know what to do because, for my emergency stint, which was very important, I had only seen COVID-19 patients" (Participant 2).

Attitudinal Needs: Attitude reflects thoughts and feelings about a person, object, or subject that can be

evaluated in his cognitive, emotional, and behavioral information. If medical students do not have hope of fulfilling their desires in their field of study, in that case, their motivation for learning and effective teaching will be impaired, which will affect their responsibility and efficiency in the future. In addition to educational adverse outcomes, the coronavirus pandemic also had significant psychological effects on graduates. Concerns about learning and future careers were evident in the interviews and dissatisfaction with the education was often mentioned. In this regard, one of the participants stated:

"I feel like we were exploited as a workforce" (Participant 6).

Another participant said: "*I felt unjustly treated in my education*" (Participant 3).

Another male doctor participant described his experience: "*I felt, I had no self-confidence as a new physician to manage patients*" (Participant 9).

"The.... Hospital was the only general teaching hospital at the provincial level and the decision to allocate this hospital to the COVID-19 section had irreversible outcomes for clinical education." (Participant 7).

A male doctor with 8 months of experience in the emergency department described his experience of workload and stated:

"They were forced to use interns and even clerkships as auxiliary forces. They had no other choice; there was a shortage of staff" (Participant 15).

Cognitive Needs: Clinical knowledge complements theoretical knowledge, and to use theoretical knowledge, students need clinical experience. However, with the COVID-19 crisis and lack of proper planning, this did not happen, and the opportunity to see patients and various cases did not exist for students. As a result, students were unable to apply their theoretical knowledge in the clinical training.

"We saw very few patients, so much so that all the cases were new during the "TAHR" (Obligation to serve in government hospitals after free education), and it was difficult for me to make any diagnosis" (Participant 10).

"When a patient comes, I get confused between differential diagnoses and I do not know how to act because I did not see patients during my internship period. I don't know how to use my theoretical knowledge"(Participant 9).

Deficiency in Professional Interactions: Establishing effective communication with patients and their companions is crucial to building trust and can be considered the heart of medicine. New general physicians could learn to communicate effectively with their colleagues, patients, and companions. However, according to them, social distancing and lack of interaction with the patient prevented this. As a result, they did not feel prepared to communicate with patients and answer common questions.

"We really did not learn to communicate with patients and their companions. For example, a patient said he takes green pills; and I do not know what pills he means; and I do not know what the right response may be. Well...., they do not trust me" (Participant 3).

A male and recent physician described his experience of social distance and lack of communication skills and mentioned:

"The need to observe social distance and the fear of contracting the coronavirus reduced face-to-face contact with us" (Participant 6).

Discussion

This study was conducted to investigate the educational challenges of medical graduates during the COVID-19 pandemic. The results suggested that two categories of factors Ineffective clinical education, and - Inadequate Outcome played a role in shaping the educational challenges of learners. This ultimately led them to have a different understanding of their capabilities as medical graduates. Graduates must possess the ability to apply scientific and practical knowledge and clinical skills. However, the coronavirus pandemic created challenges for medical education and the establishment of necessary competencies in medical students (5, 9). New general physicians who were medical interns during the COVID-19 pandemic had varied feelings about that.

The first finding, related to ineffective clinical education, indicated that the need to preserve the health of students forced medical educators to adopt and utilize technology and e-learning-based education In this study, the main challenges of online education faced by new general physicians were the use of content, content quality, downloads, fatigue, sleepy, and students' lack of focus due to instructors' not using webcams because of low internet speed, and hence not seeing the instructor. The participants highlighted that slow internet speed, inadequate infrastructure, and insufficient software were significant challenges in online education. The study conducted by Albalas et al (2020), Hayat et al (2021), Maatuk et al (2022), and Yazdani et al (2017) mentioned the lack of infrastructure, technology, internet access, and poor quality of internet services as

barriers affecting both students and faculty members (15-18). However, at the same time, confusion and weakness in crisis management sometimes lead to unexpected and unplanned decision-making. Allocating the sole general educational hospital as a center for patients with COVID-19 and suspending training rotations with every peak of the COVID-19 pandemic were among these decisions that reduced the number and variety of cases and irreparable damage to clinical education. This led to a decrease in clinical skills as well as professional growth and essential competencies of graduates, which in turn led to anxiety and a lack of confidence in their professional performance. The Association of American Medical Colleges and most medical universities also decided to suspend clinical rotation with the first wave of the COVID-19 pandemic (19, 20). The study conducted by Franklin et al (2021) stated that more than half of the students stated that their specialties surgery, internal medicine, and obstetrics and gynecology, and their sub-specialties were affected by the temporary quarantine due to the COVID-19 pandemic (21).

The second finding, regarding the failure to gain necessary knowledge, skills, attitudes, and deficiencies in professional interactions, were consequences of deficient education, causing students' concern for their future careers. This seemed to take away the students' confidence needed for patient management, communication with the patient, and making proper diagnoses. In a study by Harries (2021), most students agreed that the pandemic has significantly disrupted their education and believed that regular clinical rotations should continue throughout the pandemic, with 83.4% agreeing to return to clinical rotations (20). Also, Hoernke et al (2020) demonstrated that engagement with actual patients is an inseparable part of becoming a physician. Medical students expressed dissatisfaction due to the lack of clinical training and interaction with patients (22). Dhillon et al (2020) demonstrated that the COVID-19 pandemic led to a notable decline in the acquisition of clinical skills, posing a considerable challenge to Canadian medical clinical training (23).

Tan et al (2023) illustrated the impact of the COVID-19 pandemic on clinical examinations, highlighting that simulated patients are incapable of completely substituting the invaluable experience and engagement that medical students derive from authentic patient interactions (24). Harries et al (2021), stated that the COVID-19 pandemic disrupted the United States

medical education system with the unprecedented and essential national recommendation by AAMC to halt all clinical rotations of students with in-person patient care (20). Additionally, Saoji et al (2022) indicated that all ongoing internship programs, clinical rotations of finalyear medical students and interns were suspended with a focus on preventing the spread of the disease (25). The impact of the COVID-19 pandemic on clinical medical education was significant in the worldwide (26-28). As a result, the participants in this study felt less confident in their abilities as general practitioners.

Negative feelings, attitudes, and dissatisfaction with non-teaching duties during the internship period were among the issues mentioned by the new physicians. Kaul et al (2021), indicated that in the face of an unprecedented shortage of qualified healthcare workers, several reliable alternatives for workforce expansion were considered, including the deployment of competent and willing medical students by institutions (29). Some institutions were forced to limit the number of team members entering patient rooms and conducting physical examinations each day to reduce the risk of transmission to healthcare workers. Fear of contracting the disease, concerns for their families, and the need for social distancing were among the barriers to acquiring physical examination skills, history taking, and other clinical skills frequently mentioned by the participants (20, 27, 30).

Deficiencies in professional interactions and the inability to establish proper communication with patients, their companions, and colleagues were also among the consequences of suspending and reducing clinical rotations and the necessity of maintaining social distance, as pointed out by the participants. Numerous texts emphasized the role and impact of proper physician-patient communication in many medical matters, including prevention, treatment, care, and treatment participation. Poor physician-patient communication can not only result in patient noncompliance with treatment but also lead to the patient being more likely to change their doctor and healthcare system (31-33).

Limitations: Given that this study was conducted at Bushehr University of Medical Sciences and due to the nature of the study and the limited number of participants, it may not be generalizable to other universities.

Additionally, some of the interviews were conducted over the phone due to the comfort of the participants

Conclusion

The COVID-19 pandemic significantly challenged medical education. The rapid shift to electronic education partially addressed the cognitive needs of medical students. However, the suspension and reduction of clinical rotations, along with the reassignment of clinical departments to COVID-19 care impacted both supervised learning and direct supervision observation. This led to a decline in clinical, cognitive, and attitudinal skills, as well as professional growth and essential competencies. As a result, many students experienced anxiety and a lack of confidence in their professional abilities. Identifying the educational challenges during a pandemic and providing appropriate solutions, such as continuing education programs for new general physicians and effective strategies for students during future crises, can significantly benefit policymakers and healthcare providers in future crises.

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Conflict of interests: There is no conflict of interest.

Ethical approval: Ethics approval and consent to participate Permission to carry out the present study was obtained from the Ethics Committee of Bushehr University Medical of Sciences (IR.BPUMS.REC.1401.174). When participants were provided with information about the objectives of the research and asked to give their permission to make audio recordings of the interviews, they were assured that the information gathered would remain confidential. Written informed consent was obtained from all the participants, and they were informed that they could leave the study whenever they wished. Also, all methods were carried out according to relevant guidelines and regulations.

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Category	Subcategory	Primary code	Semantic Units
Ineffective	Poor	unexpected cancellation of educational	We were supposed to visit the patients at the
clinical	management of	programs and departments	hospital's clinic with the professor. However, to our
education	clinical		surprise, the clinic was canceled
	education	Decreasing the number of morning	and the number of morning reports in core
	planning	reports in major clinical departments	specialties such as pediatrics, gynecology, obstetrics,
		(internal medicine, pediatric).	and internal medicine had been reduced
		The lockdown of training hospitals	all of our clinical rotations were on lockdown with
		with every wave of COVID-19	each wave of the coronavirus
	Clinical	shortage of patients, a diverse range of	only teaching hospital was the COVID-19 center,
	resource	cases, a significant decrease in elective	so we only treated COVID patients. Consequently,
	restriction	surgery	the number of general patients and a variety of cases
			of other diseases decreased
		the poverty of support and protective	at every shift work, the head nurse only gave us
		equipment (mask, gloves, resting place	one N95 mask. If we took it off for lunch, they
		during night shift)	wouldn't give us another one
	Online learning	Lack of communication with the	I couldn't concentrate in the online class because I
	pitfalls	professors, lack of focus in virtual	didn't interact with the professor
		classes, Low quality of uploaded files	
		(sound and images)	
		Slow internet speed and frequent	The infrastructure is poor the internet speed was
		outages. class fatigue and sleepy	low and as a result connection to the class was
			frequently interrupted and would cause the teacher not
			to use the webcamWell, I have been falling asleep

Table 1. An example of the process of extracting a theme from semantic units, codes

Table 2. Demographic characteristics of the new general physician during the COVID-19 era

Participant number	Age (year)	Sex	Marital status	Interview Format	Work experience	Workplace
1	26	Female	Marriage	In-person	5 months	Health care center
2	26	Female	Single	In-person	4 months	Hospital
3	26	Female	Single	By phone	6 months	Hospital
4	26	Male	Single	By phone	1 month	Hospital
5	27	Female	Single	By phone	9 months	Hospital
6	25	Male	Single	By phone	6 months	Hospital
7	27	Female	Marriage	In-person	10 months	Health care center
8	27	Female	single	In-person	6 months	Hospital
9	27	Male	Single	By phone	12 months	Hospital
10	28	Male	Single	By phone	12 months	Hospital
11	27	Female	single	In-person	12 months	Health care center

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12	26	Female	Marriage	By phone	6 months	Hospital
13	27	Female	single	In-person	6 months	Hospital
14	25	Female	single	By phone	6 months	Hospital
15	27	Male	Single	In-person	8 months	Hospital
16	26	Male	Single	By phone	6 months	Hospital
17	26	Female	single	By phone	6 months	Hospital

 Table 3. The categories and subcategories

Category	Subcategories		
In officiative aligibal advertion	Poor management of clinical education planning clinical resource restriction		
menective chinical education	online learning pitfalls		
	Skill-needs		
In a da questa Outraama	Attitude- needs		
Inadequate Outcome	Knowledge-needs		
	Deficiency in professional interactions		