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Factors influencing the resilience of clinical education in general medicine in Iran: a qualitative content analysis study



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Abstract

Background Clinical education is one of the key components of medical education and directly affects the efficiency, professional skills, and quality of future services graduates provide. Additionally, resilience plays an essential role in facing crises and forming medical students' professional identity. Strengthening resilience can accelerate this process. Therefore, this study was conducted to comprehensively understand the dimensions and factors affecting resilience in the clinical education of general medicine, based on the experiences of stakeholders, including professors and students present in clinical environments.

Methodology This qualitative study was conducted based on purposive sampling among ten faculty members and six medical students. The data collection process was conducted from September 2023 to April 2024 through semi-structured interviews. Interviews were transcribed, and data analysis was accomplished according to the steps proposed by Graneheim and Lundman (2004).

Results Data analysis revealed three themes that reflected the factors influencing resilience in clinical education: Facilitators of resilient clinical education, Barriers of resilient clinical education, and Prerequisite factors of resilient clinical education.

Conclusion According to the results, in order to create a resilient clinical education system, it is necessary to pay attention to factors such as the use of residents in teaching, cooperative learning, effective interaction, strong knowledge base, infrastructure development, and spreading the culture of learning from experiences. In the meantime, obstacles such as the loss of trust between community members and doctors, heavy workload, non-scientific management and treatment-oriented clinical training centers can prevent the realization of this goal. On the other hand, supporting faculty members with training programs and job promotion as well as paying attention to individual resilience are considered as facilitating factors in this direction.

Keywords Resilience, Qualitative Research, Undergraduate Medical Education

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Background

The COVID-19 crisis highlighted the importance of resilience in educational systems and attracted the attention of researchers and policymakers to the response of these systems and the transformation of students' learning experiences [1]. Given that crises are inevitable, universities, as organizations [2], should cultivate the skills of anticipating, coping with, and adapting to challenges, and act on lessons learned in advance. The term 'resilience' in



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organizational studies was first introduced by Mayer in 1982. It refers to the ability of organizations to manage crises and return to their original status [1]. Resilience is a key factor for organizations to succeed in volatile times, enabling them to handle various disruptions, from negative trends to major crises. A resilient organization can respond to any disruption, and even thrive in the face of it. Recent research shows that organizational resilience is complex and multifaceted, with definitions varying across different fields of study. In management and organizational studies, resilience is considered as a broad concept with diverse perspectives and approaches. Previously, resilience was evaluated as a post-crisis outcome, limited to the ability to return to the pre-crisis state. However, it is now recognized as a process that leads to positive outcomes and emphasizes the interactions between the organization and its environment. Therefore, resilience involves effectively dealing with difficult situations not only after they occur but also before and during them [3]. Consequently, educational institutions must develop coping strategies to respond quickly and cost-effectively to crises and ensure the continuity of high-quality educational services through adjustment and adaptation. In this context, resilience is defined as the ability of an educational institution to withstand disruption or quickly return to normal status while guaranteeing services with the same quality [4]. Over the past two decades, concepts related to efficient performance have become prominent in the educational paradigm. Research has explored the resilience of the educational community as a key predictor of the efficiency of the educational system [5]. Today, the health system, as a significant part of the educational system, requires expert and efficient individuals to meet the quantitative and qualitative needs of society. One of the primary goals of universities of medical sciences is to ensure the continuity of education during crises and provide high-quality human resources, which play a crucial role in the health system. To this end, the medical curriculum comprises two components: theoretical education and practical training to develop clinical skills [6]. Since most professional learning for medical students occurs at the bedside, clinical education is regarded as one of the most crucial components of medical education. It is directly linked to the efficiency, professional competence, and quality of future services provided by medical graduates [7]. Health system experts consider clinical education the most important aspect of professional training [8–10]. Furthermore, clinical practice is essential as it prepares medical students for their professional roles and helps them develop their professional identity [10]. On the other hand, resilience plays a crucial role in managing crises and shaping medical students' professional identity and its enhancement can accelerate this process [11]. Resilience as a phenomenon is commonly addressed by academics. the literature, has highlighted a critical gap in understanding how organizations can effectively develop and maintain resilience [1, 12], and the conceptualization of resilience as a complex variable has not yet been achieved [13, 14]. In addition, research on organizational resilience has shown varied results, creating challenges in understanding why certain organizations are more resilient to crises and providing meaningful recommendations for coping with adversities [13]. Therefore, given the importance of resilience in clinical education and the well-known impact of internal and external factors, such as crises, on the medical education—especially clinical education— [10], our aim was to achieve a comprehensive understanding of organizational resilience in the context of clinical education to provide a deeper understanding of the phenomenon. By gaining a deeper understanding of this concept and sharing our findings with university officials, stakeholders, and policymakers, we can take measures to ensure that clinical education continues during disasters. We can create tailored curricula for critical situations, enhance the resilience of clinical education programs, and ultimately improve the overall quality of education. To our knowledge, no study has investigated the resilience of clinical education in the Middle East and Iran. this study aimed to achieve a comprehensive understanding of the dimensions and factors affecting the resilience of clinical education in general medicine in Iran. This research is based on the experiences of stakeholders, professors, and students in the clinical settings.

Methodology

Study design

This study employed a qualitative approach and conventional content analysis to describe a phenomenon. By addressing the "how" and "why" of the research, this type of study can yield rich and diverse insights into individual experiences [15]. The qualitative content analysis helps to better understand the phenomenon under investigation [16]. We used qualitative research methods to explore how participants' experiences shaped their understanding and how that evolved. Content analysis can provide reliable outcomes, generate insights, and guide organizational activities based on textual data [17].

Setting

The present study was conducted at Shiraz University of Medical Sciences, one of the most important medical education centers in southern Iran. This public university, located in the city of Shiraz, was founded in 1946 and consists of various faculties such as the school of health, medicine, nutrition sciences, new medical sciences and technologies, virtual education, nursing and midwifery, paramedical, rehabilitation, pharmaceutics, dentistry, management and information. The university currently comprises 17 faculties with more than 10,000 students, 200 majors, 782 faculty members, 54 research centers, 13 educational hospitals, 49 medical hospitals, and 32 health care networks, and provides health care services to more than 4 million people. In addition to educational and research activities, the university provides services to patients and the needy by providing complex therapeutic activities such as liver, heart and kidney transplantation, along with other advanced therapies, and serves as one of the largest and most prestigious universities in Iran [18].

Participants

Purposive sampling was used in this study. In this type of sampling, participants are selected based on their first-hand experience and knowledge about a phenomenon, and the sampling ends when the data are saturated. Accordingly, the participants were faculty members of the Faculty of Medicine responsible for clinical teaching in university-affiliated clinical centers, specialists in medical education, and students in the clinical phase of general medicine. To ensure maximum variation, faculty members from the clinical education program were selected based on age and diverse work experience. Since clinical training for medical students occurs in the final three years and at different levels, we aimed to maximize diversity in our sample by including students in the clinical semester from various admission years. Exclusion criteria included the participants' unwillingness to continue cooperation. A total of 16 students and faculty members from Shiraz University of Medical Sciences were selected and interviewed (Table 1).

Data collection

In-depth, semi-structured interviews were conducted in Farsi over eight months, from September 2023 to April 2024, with the permission of the University Vice-Chancellor for Research. Each participant was interviewed individually. Participants' experiences were extracted according to the study objectives. All participants were asked to recall their experiences from the beginning of their clinical training period until the interview. For example, if a student was interviewed at the end of the 13th semester, the questions covered all their experiences up to that point. The time and location of the interviews (in a private room at the hospital) were arranged with the subjects who agreed to participate.

To start the interview, we first asked a general question: "Tell me about your experience regarding resilience in the clinical education of general medicine?" As the interview progressed, the questions were directed towards the purpose of the research. Based on the responses, we asked the participants the following questions for a deeper understanding of the concept being investigated: "What do you think the characteristics of a resilient clinical education are?" "What are the strategies and motivations for resilience in clinical education in our system?" Probing questions were also asked, such as "Can you

Ρ	Academic Ranking	Clinical Education Experience (years)	Age (years)	Sex
F1	Associate Professor of Medical Education/MD	7	50	male
F2	Assistant Professor of Pediatric Neurology	5	39	female
F3	Professor of Interventional Cardiology/M.S. medical educa- tion	28	54	male
F4	Assistant Professor of Radiology	9	39	female
F5	Associate Professor of Pediatric Cardiology	9	43	male
F6	Assistant Professor of Hematology & Oncology	10	44	male
F7	Professor of Nephrology	30	67	male
F8	Professor of Pulmonary Diseases	33	66	male
F9	Assistant Professor of Glaucoma	4	38	male
F10	Professor of Infectious Disease	28	53	male
S1	Medical student, semester 10	-	23	female
S2	Medical student, semester 13	-	25	female
S3	Medical student, semester 12	-	26	male
S4	Medical student, semester 14	-	27	female
S5	Medical student, semester 11	-	24	male
S6	Medical student, semester 14	-	26	male

Table 1 Demographic characteristics of the interviewees

explain more?", "Could you elaborate?", and "You mentioned that... could you explain further?" At the end of each interview, questions such as "Do you have any other comments?" and "Do you think there is a question that hasn't been addressed?" were also asked.

All interviews were recorded with the participants' permission. The first researcher, who had the necessary training to conduct qualitative studies, transcribed the interviews. Only the first researcher knew the participants' identities, while the other researchers received anonymized interview transcripts. Depending on the interviewees' conditions and their satisfaction, the duration of the interviews ranged from 30 to 60 min, with an average of 45 min.

Data analysis

Data analysis was performed simultaneously with data collection using the five-step content analysis approach proposed by Graneheim and Lundman [19]: 1. The text of each interview was transcribed word for word, and to achieve a general understanding of the content, we carefully read the text several times. 2. Sentences related to the research topic were identified as meaning units. 3. Primary codes were extracted. 4. The extracted codes were classified into conceptual categories based on similarities and differences. 5. By systematically comparing the initial conceptual categories, more abstract concepts were generated. The analysis was primarily conducted by the first author, with continuous supervision by the other authors. In coding the interview transcript, the researcher noted their own experiences and assumptions (reflexive memos) to consider how these might influence their interpretation. One observer analyzed parts of the data alongside the first author, and interpretations were continuously discussed with all authors at each stage, including coding, grouping of codes, and interpretive levels of the themes, to ensure trustworthiness.

Trustworthiness

For assessment of the trustworthiness of the collected data, Guba and Lincoln's standards for scientific rigor in qualitative research were used: credibility, confirmability, dependability, transferability [20]. To enhance credibility and dependability, the researcher continuously engaged with the data and reviewed the interview texts multiple times for a comprehensive understanding. This process was further strengthened by ensuring maximum diversity in sampling, member checking, peer checking, and external debriefing. In peer review, two qualified researchers assessed the accuracy of the data analysis. During member checking, some participants confirmed the alignment between the study findings and their experiences. For transferability, clear explanations were provided about

Ethical considerations

The ethical approval for the study was obtained from the Research Ethics Committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1402.250). All procedures were performed following relevant guidelines and regulations, including the Declaration of Helsinki. Before conducting the interviews, the participants were given detailed information about the study objectives, and their signed informed consent was obtained before the interviews were recorded. The anonymity of the participants and their responses was maintained, with pseudonyms or codes used to protect their identities. Participation in the study was entirely voluntary and did not impact academic progress. Participants could withdraw at any time. Interview data were encrypted and stored on a personal hard drive for long-term preservation. We assured the participants that they could view the group findings if desired.

Findings

Out of 16 participants, 10 were faculty members and 6 were medical students. The participants' experiences and perceptions were extracted and analyzed. Based on the results of the analysis, 12 categories were extracted within three main themes after coding and comparing the codes based on similarities and differences: "Facilitators of resilient clinical education," "Barriers of resilient clinical education," and "Prerequisite factors of resilient clinical education" (Table 2).

Theme 1. Facilitators of resilient clinical education

The theme "Facilitators of resilient clinical education" refers to the factors that make clinical education more resilient. Based on the participants' experiences, this concept pertains to the six basic components: resident as a teacher, collaborative learning, effective communication, support for faculty, resilient at the individual level and valuing expertise.

Resident as a teacher

This category highlights the positive impact of involving residents in internship training and underscores the necessity of utilizing them in critical situations to enhance the resilience of clinical training. According to most participants' experiences, assistants perform their educational roles more effectively when these roles are defined as duties and obligations within the educational system.

Table 2 Categories and subcategories of the themes

Theme	Category	Sub-category
Facilitators of resilient clinical education	· Resident as a teacher	
	· Collaborative learning	-Launching a mentorship system - networked learning - Peer learning
	Effective communication	-Teacher and student interaction - Universities interaction -Peer interaction
	· Support for faculty	-Teacher training program -Teacher promotion program
	· Resilience at the individual level	-Self-reflection -Clinical self-efficacy -Perseverance -Job commitment
	· Valuing expertise	-Planning by experts -Academic autonomy
Barriers of resilient clinical education	· Sense of community	-job Position -Trust in physicians
	· Poorly crafted policies	-High workload -Non-scientific management -Being treatment oriented -Being research oriented
Prerequisite Factors of resilient clinical education	· Strong knowledge bases	-Complementary courses -Up to date educational content -Self-directed learning -Blended learning -Up-to-date instructional strategy
	· Adequate operational sources	-Financial resources -Infrastructure development
	\cdot Sensitivity to possible threats	-Crises prediction -Planning strategies
	$\cdot \text{The culture of learning from experience}$	-Organizational learning -Knowledge management

"However, the resident views the sick student from a more relatable perspective, treating them at the same level as an intern student. The resident communicates and explains in an easily understandable way. Additionally, during critical times, the resident's role in education becomes very prominent."[F2].

"If residents are going to teach us, it is better if this responsibility is defined as part of their duties from the beginning. When they accept this responsibility, I believe they will be more committed to the training."[S3].

Collaborative learning

According to the participants' experiences, one factor that facilitates the resilience of clinical education in critical conditions is the adoption of cooperative education. Accordingly, the elements that lead us to cooperative education are listed below as a subcategory:

Launching a mentorship system

Mentoring in education involves a relationship between two individuals, where the mentor plays a supportive and advisory role for the learner. This relationship enhances the learner's skills and knowledge through the mentor's experience. According to the participants in this study, implementing a mentorship system is crucial for highquality education because it promotes individual growth and development while ensuring the transfer of skills and professional standards to the next generation.

"I believe the mentoring system that started during the Corona period and became common among children was very effective. It established good relationships and was very helpful for those who didn't know much."[S1].

Networked learning

Networked learning involves developing and maintaining relationships with people and information. In networked learning, communication is structured so that individuals support each other's learning. According to the participants' perceptions, network learning opportunities that can be provided to students in times of crisis, such as during the COVID-19 pandemic, include the formation of learning groups, communication channels, and educational pages on social networks.

"During the initial COVID-19 outbreak, everything became chaotic. However, when we started WhatsApp groups and Telegram channels and stayed in contact, the situation improved. Anyone with educational resources or useful information would post it on the channel, and we would plan to study or share the work."[S4].

Peer learning

Peer learning is a process in which students learn with and from each other. According to the participants' experiences, different strategies can be applied for this purpose: student–led workshops, study groups, peer-to-peer learning partnerships, and group work.

"Sometimes, a series of lectures, workshops and group works are determined for them, which they have to do in the groups they have already formed. That means the students themselves are also used for training."[F4].

Effective communication

Effective communication is the process of exchanging ideas, thoughts, opinions, knowledge, and data in a way that ensures the message is received and understood clearly and purposefully. The participants' experiences reflect the view that effective communication encompasses teacher-student interactions, peer interactions, and university interactions.

"We could not enter the qualitative world or mental space of our students. It is essential to create a shared quality world between professor and student, as well as among students themselves. This requires resilience."[F1].

"Establish and strengthen our communication with professors from various locations. Currently, we are jointly conducting our conferences with several universities."[F5]

Support for the faculty

As to supporting professors, participants have noted the importance of attention to training programs and the promotion of professors.

Page 6 of 12

Teacher training program

The need for clinical professors to complete empowerment courses, facilitate training, increase digital literacy, and address educational needs were among the points mentioned by the participants.

"As I mentioned, teachers play the main role. Therefore, supporting professors, addressing their problems, and focusing on their educational needs are crucial for building resilience." [F7].

Teacher promotion program

As to the professors' promotion program, the participants' statements reflect the need for psychological support for professors, the promotion of efficient professors, and an emphasis on the non-research-oriented nature of the promotion program.

"We should also recognize the dedication of professors. Promotion should not be based solely on publishing articles. Professors sacrificed their lives during the COVID-19 pandemic and did need psychological support."[F6].

Resilient at the individual level

According to the participants' statements, one of the motivating factors in achieving resilient clinical education is the individuals' personal resilience. This resilience is reflected in self-reflection, clinical self-efficacy, perseverance, and job commitment.

"Based on 70 years of continuous education in medical sciences, both general and specialized, a series of promotion keys and indicators of clinical efficiency and resilience can be observed in the professors and the system. These indicators play an important role in the continuation of education."[F3].

Valuing expertise

Valuing and referring to experts is very important when a crisis occurs. According to the participants' statements, planning by experts and having academic independence motivate people to be resilient in clinical education.

Planning by experts and academic autonomy

"I don't know much about these things. There is a need to form specialized working groups to examine all aspects and develop a plan." [F8]

"Academics should be given the freedom to act. They should entrust responsibilities to their assistants and trust the intelligence and capabilities of those within the university."[F6].

Theme 2. Barriers of resilient clinical education

Based on the participants' experiences, the concept reflecting the barriers to resilience in clinical education involves two basic components. The first is the feelings conveyed to physicians by society, and the second is the laws that have been passed.

Sense of community

Sense of community is a feeling of belonging that members have, a sense that they matter to each other and to the group, and a shared belief that their needs are met through their commitment to being together. Based on the participants' experiences, this feeling is meaningful through understanding one's job position in society and the trust people have in doctors.

Job position

A job position refers to a person's specific role in an organization or society, including the job description, responsibilities, location, and requirements related to what the person in that position should know and be able to do.

"What kind of trouble has society brought to doctors that makes them believe they are no longer supposed to learn or do anything? They feel they are just supposed to finish this course, become a resident, or emigrate."[F5].

Trust in physicians

Trust is a crucial element in any interpersonal relationship, and it is important in the patient-doctor relationship.

"Society has also changed. If you ask the old professors what they did in the past, they say they had to deliver babies, see 20-day-old infants, treat 70-yearold men, and manage myocardial infarctions. They were removing moles, performing circumcisions, and doing limited surgeries because society demanded it. However now, there is a famous saying: 'See him tonight and I will take him to a doctor tomorrow!"[F5].

Poorly crafted policies

Poorly formulated policies can lead to confusion, inconsistency, and frustration for those who must both follow and implement them. Based on the participants' statements, these policies include the heavy workload of clinical professors, non-scientific management, and a treatment-oriented and research-oriented educational system.

"All the medical work in public hospitals that people visit today is the responsibility of the educational system. In practice, the private sector does not carry the burden of treatment. In addition to the educational work, the amount of healthcare work is high, and this treatment load is entirely borne by the professors and the educational system."[F10].

Theme 3. Prerequisite factors of resilient clinical education

The prerequisites for resilient clinical education refer to the necessary items and initial planning needed to achieve resilient clinical education. Based on the participants' experiences, this concept can be described in four components: strong knowledge bases, adequate operational sources, sensitivity to possible threats, and the culture of learning from experiences.

Strong knowledge bases

One of the important factors for the resilience of clinical education during a crisis is a strong knowledge base. Based on the participants' experiences, several factors should be considered for this purpose. These factors are listed as subcategories below:

Complementary courses

Experience has shown that supplementary courses can reinforce and enhance learning. Based on the interviewees' experiences, these courses can include both faceto-face and online formats, tailored to the needs of the audience.

"Every month, for at least three hours, sometimes in person and sometimes online, I discuss common diseases with them from the perspective of someone who graduated here and understands their needs."[F2].

Up-to-date educational content

Training content should be updated based on expected skills for better utilization of learning opportunities.

For example, without any pressure, you should have instructed all departments to establish their online lecturing infrastructure and continuously update their content. This content should be periodically reviewed and utilized. The IT department should develop and maintain the online lecturing infrastructure, prepare and deliver it to the departments, and gather feedback from them."[F4].

Self-directed learning

Self-directed learning is a process in which learners are responsible for designing and evaluating their learning experiences. According to the participants' perceptions, self-directed learning facilitates learning and self-management in students.

"In my opinion, self-directed learning is the solution, and we should move towards cooperative education. We need to move away from spoon-feeding students. Strengthening self-directed learning at the university level will allow students to make decisions about their own learning."[F1].

Blended learning

Blended learning, a thoughtful integration of e-learning and face-to-face learning, is popular in medical education. Participants' experiences highlight the effectiveness of this method in empowering both students and professors.

"We need to prepare videos of some procedures, record them, and provide them to the students. Some procedures should be done in small groups, while others should be presented through lectures. We can also combine various educational models."[F9].

Up-to-date instructional strategy

Up-to-date educational strategies are crucial for promoting and facilitating learning. According to the participants' experiences, various strategies can be employed: using modern techniques and simulators, providing feedback, rethinking approaches, and conducting interactive workshops.

"You should avoid using repetitive methods! There are many new techniques available globally that can be adopted, such as simulators and innovative online workshops."[S5]

Adequate operational sources

Another important prerequisite for having resilient clinical training is adequate operational resources. In this context, participants referred to financial resources and infrastructure development.

"We must recognize that without adequate financial resources, our efforts will be ineffective. Many countries that allocate a budget in advance to address crises experience less damage and achieve their goals more easily."[F7].

"In my opinion, we should use the opportunity presented by the COVID-19 pandemic to strengthen our infrastructure and maintain those improvements."[F9]

Sensitivity to possible threats

According to the interviewees, predicting potential crises and having a separate strategic plan for each one are crucial factors in preparing for effective confrontation and resilience against crises.

"We must always have a plan. The education system needs a Plan B so that if something happens, we don't have to start from scratch. We should be able to switch to a pre-prepared program."[F10].

The culture of learning from experiences

Developing a culture of learning from past experiences and retaining the lessons learned from crises is essential for resilient clinical education. According to the participants, this can be achieved through organizational learning and knowledge management.

Organizational learning

Organizational learning refers to the process of gathering and transforming the knowledge of the employees in a company into its overall knowledge base [21].

"The virtual experience during the COVID-19 era was a significant achievement. It revealed the weaknesses and strengths of virtual education. We should not dismiss it now by saying that virtual education does not exist. Instead, we should leverage its strengths and address the deficiencies in our educational content. This valuable experience should not be overlooked."[F10].

Knowledge management

The participants pointed to the creation, collection and storage of knowledge in the direction of knowledge management.

"We must ensure that if a crisis occurs, we have, for example, 100 lectures prepared in advance by our professors. We need to have backups of these lectures and have them recorded and stored securely." [F5].

Discussion

This research aimed to identify all aspects of resilience in clinical education within general medicine. The main factors affecting resilience in this context included facilitators, barriers, and prerequisites of resilient clinical education.

Facilitators of resilient clinical education

Utilizing residents as clinical instructors has been recognized as a factor that enhances the resilience of clinical education. Medical students benefit significantly from residents as teachers; it is estimated that approximately one-third of their clinical learning comes from residents [22]. Residents can help build resilience in other students by actively engaging in teaching and providing support and guidance [23]. To enhance residents' teaching roles, it is recommended that medical universities focus on holding pedagogical workshops, improving clinical training skills, boosting motivation, reducing workload, addressing training barriers, publishing intern feedback, and conducting regular evaluations by faculty members [24]. Additionally, the mentorship system provides students with essential opportunities for professional growth and success [25]. the successful mentorship program at Shiraz Medical School started in 2015. High-ranking medical students were selected as mentors, and workshops on teaching, assessment, communication, and consulting techniques were held. Mentees received guidance on various skills, and evaluations showed that mentoring helped them adjust faster and improve their grades. The program expanded to include international students, showing significant improvements in their academic performance [26]. The study by Prayson et al. (2017) shows that students with mentors can identify stressors and articulate resilience strategies to manage them [27]. From the systemic perspective, achieving resilience requires participation and learning at all levels [28], and Collaborative learning has been proposed as a prerequisite for operationalizing resilience [29]. Social communication theory emphasizes the importance of communication networks in educational environments [30]. To meet the need for interaction, online education has introduced new communication channels between students and instructors. These channels include video conferencing, online chat platforms, and email [4]. On the other hand, building resilience in medical education starts with focusing on human connection and sense of belonging [31]. According to the experiences of the participants in this study, resident as a teacher, collaborative learning and effective communication facilitate resilience in clinical education.

In additional, the findings of this study suggest that support for professors (in the areas of promotion and training), individual resilience, and valuing specialties are facilitating factors in the resilience of clinical education. In this regard, social support theory emphasizes the role of perceived support from social circles in managing stress and increasing well-being, especially during challenging times. This theory describes the types of emotional, informational, and instrumental support and their impact on reducing stress and strengthening resilience. The results of the study by Alkhansaa Diab and his colleagues (2024) highlight the importance of educational workshops for teachers as a supportive and collaborative space for joint learning. These workshops provide a platform for exchanging experiences, gaining strength from each other, and acquiring necessary skills [30]. Additionally, studies have shown that a person's level of resilience is significantly related to mental health outcomes. People who score higher on individual resilience measures also have high scores on psychological performance measures, and vice versa [32, 33], As far as reflection and selfefficacy are mentioned as vital elements for increasing individual resilience [32, 34]. Reflecting on daily stressors and the effectiveness of coping strategies and resources is said to be helpful in enhancing personal resilience [35]. Individuals with high levels of self-efficacy tend to have stronger resilience [36]. In the current study, reflection and self-efficacy at the bedside were recognized as elements of personal resilience.

In line with the present study, which considers specialization as one of the facilitating factors in achieving resilience in clinical education, Baniya and his colleagues (2021) confirm this. They state that in times of crisis, real, relevant, and documented information is critical to survival. Therefore, it is important to value and turn to experts during disasters, especially in long-term crises such as a pandemic [37].

Barriers of resilient clinical education

On the other hand, a sense of community and poorly developed policies were identified as factors that hinder the resilience of clinical education. A sense of community embodies people's feelings of belonging, mutual significance, and the shared belief that their needs are fulfilled through their commitment to the group [38]. Based on the experiences of the participants in this study, the sense of community becomes meaningful through understanding the job position in society and the people's trust in doctors. In the meantime, the lack of trust between doctors and patients has become a significant issue and is the main reason for the breakdown of the doctor-patient relationship [39]. According to the participants' experience, Iranian doctors are not satisfied with their job position and patients do not trust doctors as they used to.

It seems that the occupational status of doctors in society has changed and declined compared to the past. People have become more informed, and their expectations of doctors have evolved. These changes can reduce the resilience and self-confidence of newly graduated doctors. On the other hand, high working hours for professors, non-scientific management, a treatment-oriented educational system, and research-oriented promotion of professors were among the weak policies mentioned by the participants. In this regard, McKinley et al. (2019) also found that doctors with a lower workload have higher resilience scores, while a high workload increases their job stress [40]. Participants believed that education is in the shadow of treatment.

Prerequisite factors of resilient clinical education

Zhou et al.'s study showed that interventions that strengthen students' self-directed learning have the potential to increase resilience. The study recommends innovative educational approaches, strategic reinforcement, and curriculum changes to promote self-directed learning awareness and internalize self-directed learning skills [41]. Therefore, strengthening positive psychology and self-directed learning abilities is suggested as a strategy to prepare for changes in education and clinical areas [42]. On the other hand, given the high social and economic costs of crises, organizations are interested in predicting crises and implementing appropriate preventive or corrective measures to increase system resilience [43, 44]. Ashraf Labib (2021) argues that control systems in organizations should identify similar types of crises by learning from past experiences and others. Decisions should be made by focusing on resilience modeling and learning from incidents [45]. The results of Evenseth et al.'s (2022) study also show that organizational resilience and organizational learning are intrinsically related. Effective learning relies on the proper management of hands-on experiences, the adoption of a systematic approach to learning, the organization's ability to discard outdated knowledge, and the presence of a supportive environment that encourages learning within the organization [46]. According to studies, knowledge management is recognized as a primary and vital factor in enhancing the resilience of organizations [47, 48]. In this regard, Ibrahim Ismael and his colleagues (2021) aimed to investigate whether knowledge management can be considered an important factor for organizational resilience and agility from the perspective of employees. Their study found that nearly two-thirds of university hospital nursing staff reported a moderate level of knowledge management, and more than half believed that the hospital had a moderate level of organizational resilience [48]. In the current study, the dissemination of learning culture from previous experiences, in the form of organizational learning and knowledge management, has been introduced as a prerequisite for achieving resilience in clinical education.

This study should continue as a grounded theory to develop the process and model of resilience in clinical education. Considering the importance of resilience in clinical education, it is suggested to develop a valid and reliable tool to measure resilience in this field for future studies. It is also recommended that studies be conducted to develop a curriculum specific to crisis situations so that it can be referred to if needed.

This study had some limitations, including the challenge of scheduling interviews with busy faculty members. To address this issue, we scheduled appointments and coordinated visits to the professors' offices in advance.

Conclusion

This study examines resilience and factors affecting it in clinical education. The results show that in order to create a resilient clinical education system, it is necessary to pay attention to factors such as the use of residents in teaching, cooperative learning, effective interaction, strong knowledge base, infrastructure development, and spreading the culture of learning from experiences. In the meantime, obstacles such as the loss of trust between community members and doctors, heavy workload, nonscientific management and treatment-oriented clinical training centers can prevent the realization of this goal. On the other hand, supporting faculty members with training programs and job promotion as well as paying attention to individual resilience are considered as facilitating factors in this direction. Overall, creating a suitable platform for learning and professional development can significantly contribute to resilience and improve the quality of clinical education.

Abbreviations

- F Faculty member
- S Student

Acknowledgements

The authors would like to extend their appreciation to everyone who agreed to be interviewed and who contributed their time and experiences to this research. Also the authors would like to thank Shiraz University of Medical Sciences, Shiraz, Iran and also Center for Development of Clinical Research of Nemazee Hospital and Dr. Nasrin Shokrpour for editorial assistance.

Authors' contributions

K.J. conducted the literature research for the background of the study, planned the study, collected data for the study, analyzed and interpreted data, and wrote the article. M.A.M. planned the study, analyzed, and interpreted data, and contributed to the writing of the article. S.A. F. planned the study, analyzed, interpreted data. R.R. and A. H. supervised the study, revised the article, and proofread the manuscript. The authors read and approved the final manuscript.

Funding

This research was performed with the financial support of Shiraz University of Medical Sciences (SUMS), Shiraz, Iran (project number 27297).

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The ethical approval for the study was acquired from the Research Ethics Committee of Shiraz University of Medical Sciences (IR. SUMS.REC1402.250). All methods were carried out in accordance with relevant guidelines and regulations or the Declaration of Helsinki. Participants were given detailed information about the study's goals before interviews were conducted, and their signed informed consent was obtained before any interviews were recorded. The anonymity of the participants, their responses, and the use of aliases or codes in quotations were guaranteed. Participation in the research was entirely voluntary and would not interfere with their academic progress, and they were given the option to drop out at any time. Both the interview and encoding data were encrypted before being saved to a personal hard drive for long-term storage. We promised to do so if a participant wanted to see the findings as a group.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Received: 17 November 2024 Accepted: 12 March 2025 Published online: 28 March 2025

References

- Bartusevičienė I, Pazaver A, Kitada M. Building a resilient university: ensuring academic continuity—transition from face-to-face to online in the COVID-19 pandemic. WMU J Marit Aff. 2021;20(2):151–72.
- Bleiklie I, Kogan M. Organization and Governance of Universities. High Educ Pol. 2007;20(4):477–93.
- Duchek S, Raetze S, Scheuch I. The role of diversity in organizational resilience: a theoretical framework. Bus Res. 2020;13(2):387–423.
- AlQashouti N, Yaqot M, Franzoi RE, Menezes BC. Educational system resilience during the COVID-19 pandemic—review and perspective. Education Sciences. 2023;13(9):902.
- OECD PISA 2022. Results (Volume II): Learning During and From Disruption. Paris: PISA, OECD Publishing; 2023. https://doi.org/10.1787/ a97db61c-en.
- Howe A, Smajdor A, Stöckl A. Towards an understanding of resilience and its relevance to medical training. Med Educ. 2012;46(4):349–56.
- Lupton T. The early sociology of management and organizations: Psychology Press; 2003.
- Beigzadeh A, Yamani N, Bahaadinbeigy K, Adibi P. Challenges and problems of clinical medical education in Iran: a systematic review of the literature. Strides Dev Med Educ. 2020;16(1):1–15.
- Pashmdarfard M, Shafarood N. Factors affecting the clinical education of rehabilitation students in Iran: a systematic review. Med J Islam Repub Iran. 2018;32:114.
- Ahmady S, Khani H. The situational analysis of teaching-learning in clinical education in Iran: a postmodern grounded theory study. BMC Med Educ. 2022;22(1):520.
- 11. Jafarianamiri SR, Qalehsari MQ, Zabihi A. Investigating the professional identity and resilience in nursing students during the COVID-19 pandemic. J Educ Health Promot. 2022;11(1):151.
- Shaya N, Abukhait R, Madani R, Khattak MN. Organizational resilience of higher education institutions: an empirical study during Covid-19 pandemic. High Educ Pol. 2023;36(3):529–55.
- Chen R, Xie Y, Liu Y. Defining, conceptualizing, and measuring organizational resilience: a multiple case study. Sustainability. 2021;13(5):2517.
- Duchek, S. Growth in the Face of Crisis: The Role of Organizational Resilience Capabilities, Academy of Management Proceedings. Briarcliff Manor: Academy of Management; 2014. p. 13487.
- Roberts C, Kumar K, Finn G. Navigating the qualitative manuscript writing process: some tips for authors and reviewers. BMC Med Educ. 2020;20(1):439.
- Assarroudi A, Heshmati Nabavi F, Armat MR, Ebadi A, Vaismoradi M. Directed qualitative content analysis: the description and elaboration of its underpinning methods and data analysis process. J Res Nurs. 2018;23(1):42–55.

Page 11 of 12

- Kohlbacher F, editor The use of qualitative content analysis in case study research. Forum qualitative sozialforschung/forum: Qualitative social research; 2006: Institut fur Klinische Sychologie and Gemeindesychologie.
- Hayat AA, Keshavarzi MH, Zare S, Bazrafcan L, Rezaee R, Faghihi SA, et al. Challenges and opportunities from the COVID-19 pandemic in medical education: a qualitative study. BMC Med Educ. 2021;21(1):247.
- Graneheim U, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. Nurse Educ Today. 2004;24:105–12.
- Lincoln YS, Lynham SA, Guba EG. Paradigmatic controversies, contradictions, and emerging confluences, revisited. Sage Handb Qual Res. 2011;4(2):97–128.
- Do H, Budhwar P, Shipton H, Nguyen H-D, Nguyen B. Building organizational resilience, innovation through resource-based management initiatives, organizational learning and environmental dynamism. J Bus Res. 2022;141:808–21.
- 22. Snell L. The resident-as-teacher: it's more than just about student learning. J Grad Med Educ. 2011;3(3):440–1.
- 23. Pletcher B, Bruun F, Banda R, Watson K, Perez A, Mejia A. Empowering Student Researchers: Critical Contributions by Emerging 21st Century Scholars: Center for Educational Development, Evaluation, & Research College of Education, Texas A&M University-Corpus Christi; 2021.
- Hajian H, Dolatabadi Z, Fakhr Ghasemi N, Hajzadeh G, Alizadeh Z, Marvi N, et al. The Attitude of Pediatric Residents and Medical Students in the Pediatric Wards of Mashhad University of Medical Sciences Regarding the Educational Role of the Pediatric Residents. Int J Pediatr. 2021;9(2):12915–25.
- 25. Beals R, Zimny S, Lyons F, Bobbitt O. Activating Social Capital: How Peer and Socio-Emotional Mentoring Facilitate Resilience and Success for Community College Students. New Developments in Pathways Towards Diversity and Inclusion in STEM: A United States Perspective. 2022.
- Ghahramani S, Seddigh F, Torabi Jahromi AR, Khandel A, Nematollahi P, Hashempoor Z, Rastegar Kazerooni A. Mentoring medical students by their peers, three years' experience at Shiraz Medical School. J Adv Med Educ Prof. 2019;7(3):156–7.
- Prayson RA, Bierer SB, Dannefer EF. Medical student resilience strategies: a content analysis of medical students' portfolios. Perspect Med Educ. 2017;6(1):29–35.
- Haraldseid-Driftland C, Billett S, Guise V, Schibevaag L, Alsvik JG, Fagerdal B, et al. The role of collaborative learning in resilience in healthcare—a thematic qualitative meta-synthesis of resilience narratives. BMC Health Serv Res. 2022;22(1):1091.
- Haraldseid-Driftland C, Aase K, Wiig S, Billett S. Developing a collaborative learning framework for resilience in healthcare: a study protocol. BMJ Open. 2021;11(8):e045183.
- Diab A, Green E. Cultivating resilience and success: support systems for novice teachers in diverse contexts. Educ Sci. 2024;14(7):711.
- McKenna KM, Hashimoto DA, Maguire MS, Bynum WE 4th. The missing link: connection is the key to resilience in medical education. Acad Med. 2016;91(9):1197–9.
- Rees CS, Breen LJ, Cusack L, Hegney D. Understanding individual resilience in the workplace: the international collaboration of workforce resilience model. Front Psychol. 2015;6:73.
- Meng H, Luo Y, Huang L, Wen J, Ma J, Xi J. On the relationships of resilience with organizational commitment and burnout: a social exchange perspective. Int J Human Resour Manag. 2019;30(15):2231–50.
- Wosnitza M, Delzepich R, Schwarze J, O'Donnell M, Faust V, Camilleri V. Enhancing teacher resilience: from self-reflection to professional development. Resilience Educ: Concepts Contexts Connections. 2018:275–88.
- Falon SL, Kangas M, Crane MF. The coping insights involved in strengthening resilience: the self-reflection and coping insight framework. Anxiety Stress Coping. 2021;34(6):734–50.
- Tait M. Resilience as a contributor to novice teacher success, commitment, and retention. Teach Educ Q. 2008;35(4):57–75.
- Baniya S, Potts L. Valuing expertise during the pandemic. J Bus Tech Commun. 2021;35(1):28–34.
- Francis J, Giles-Corti B, Wood L, Knuiman M. Creating sense of community: the role of public space. J Environ Psychol. 2012;4(32):401–9.
- Sun J, Zhang L, Sun R, Jiang Y, Chen X, He C, Wei J. Exploring the influence of resiliency on physician trust in patients: an empirical study of Chinese incidents. PLoS One. 2018;13(12):e0207394.

- McKinley N, Karayiannis PN, Convie L, Clarke M, Kirk SJ, Campbell WJ. Resilience in medical doctors: a systematic review. Postgrad Med J. 2019;95(1121):140–7.
- Zhou H, Wang Y, Cheng L. The mediating effect of self-directed learning in the relationship between caring and resilience among Chinese nursing students: a multi-center cross-sectional study. Nurse Educ Today. 2022;119:105598.
- Hwang EH, Kim KH. Relationship between optimism, emotional intelligence, and academic resilience of nursing students: the mediating effect of self-directed learning competency. Front Public Health. 2023;11:1182689.
- Ciapessoni E, Cirio D, Pitto A, Massucco S, Sforna M, Marcacci P. Model based resilience assessment and threats mitigation: a sensitivity based approach. In2018 AEIT International Annual Conference. IEEE; 2018. pp. 1–6.
- Ayebi-Arthur K. E-learning, resilience and change in higher education: helping a university cope after a natural disaster. E-learning Digit Media. 2017;14(5):259–74.
- 45. Labib A. Towards a new approach for managing pandemics: Hybrid resilience and bowtie modelling. Safety Sci. 2021;139:105274.
- Evenseth LL, Sydnes M, Gausdal AH. Building organizational resilience through organizational learning: A systematic review. Front Commun. 2022;7:837386.
- Alharthy A. Sohaib O. Hawryszkiewycz I. The impact of knowledge creation on organizational resilience towards organizational performance. In Proceedings of the 27th International Conference on Information Systems Development (ISD2018), Lund: 2018. pp. 1–12.
- Ibrahim Ismael Z, Mamdouh El-kholy S, Saeed Ahmed Abd-Elrhaman E. Knowledge management as a predictor of organizational resilience and agility. Egypt J Health Care. 2021;12(4):1397–412.

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