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Strategies for sharing pedagogical knowledge in clinical education in adapting to the impact of COVID-19

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Abstract:

BACKGROUND: The extent and complexity of knowledge in the field of medicine necessitate modern education systems. Rational performance in the education system depends on the synergy of educators through knowledge sharing as the basis of education. The aim of this study was to investigate the knowledge-sharing strategies in clinical education and its changes during the COVID-19 pandemic.

MATERIALS AND METHODS: The content analysis was conducted in 2019 at Birjand University of Medical Sciences. Twenty-seven clinical instructors with enough experience and knowledge in the field of clinical education were chosen based on purposive theoretical sampling. Data collection was done by semi-structured interviews, which continued until data saturation. The interviews were recorded, transcribed, and read several times to obtain a whole understanding. Next, the meaning units and initial codes were identified, and then, they were classified into subcategories and categories. To ensure the trustworthiness of the data, Lincoln and Guba criteria were considered.

RESULTS: The results of the study include five pedagogical knowledge-sharing strategies: “peer-helping, clinical education workplace,” “use of cyberspace,” “student mediation,” “working teams,” and “scientific communities.” Coronavirus pandemic was identified as the “facilitator” and the “culturalization factor” of knowledge sharing. In addition, “lack of shared knowledge management,” “lack of compliance with needs,” and “dispersion of content” were considered as barriers to the efficiency of pedagogical knowledge sharing during the coronavirus pandemic.

CONCLUSIONS: Sharing knowledge in a clinical education setting could continue by various strategies. The results can be used in planning for the professional development of professors.

Keywords:

Clinical education, pedagogical knowledge, qualitative study, sharing knowledge

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Introduction

As medical science develops and medical care supply becomes more complicated, the educational process changes, as well. As a result, educational experts in health care should look for continuous learning to preserve everyday knowledge and skills.^[1,2] The instructors need knowledge in various domains to do practice (i.e., education). Therefore with increasing changes in knowledge and different expectations

from faculty members, application of state-of-the-art knowledge in education is vital.^[3,4]

This knowledge that is related to teaching process, cognitive and social theories of learning along with an understanding of these theories in educational classes, is called pedagogical knowledge^[5] and, in the cultural context and in association with experience, it results in some insight and awareness in the instructor. Consequently, the learning process would improve.^[6]

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This professional knowledge is achieved by experience.^[7] Therefore, sharing the implicit and explicit knowledge in people leads to positive attitudes to some processes and procedures, which prompts the generation of new knowledge.^[8] In Ipe's term (2003), knowledge sharing is the act of making available the knowledge to others, so that it could be understood and absorbed.^[9] It lays the foundation for lifelong learning in instructors.^[10] Improvement in clinical education through enhancement of instructors' pedagogical knowledge and its management would increase the quality of health services.^[11]

Studies show that, since knowledge is not shared among the instructors,^[12,13] in many cases, their educational function is based on the integration of their student time educational experiences along with general impressions of teaching, personal experience, and observation.^[14] However, in a knowledge-oriented learning environment such as university, the main focus should be on sharing knowledge.^[10] Sharing knowledge is a human activity which is influenced by many factors, such as any other activity. However, knowledge sharing is often considered as an extra time-consuming activity.^[15] This is more significant in medical sciences due to involvement of the faculty members in treatment as well as education. Various studies indicate the learning about the professional knowledge and expertise development among.^[16,17] This learning is implicit, indirect, opportunistic, unstructured, and unsupervised. In this type of learning, the person has little awareness of what he/she learns. Since learning might not immediately be applied, it is likely stored and used in the future, when it is applicable.^[7] In other words, knowledge-sharing behavior occurs not only in what encourages or ignores the exchange of knowledge but also in the way knowledge sharing happens.

At the time of the COVID-19 pandemic and change in the education condition and environment, the transfer of pedagogical knowledge could be analyzed by information technology tools or knowledge-management system. However, considering the complications and various traits of an insecure environment, new approaches are needed,^[18] because there are new limitations in knowledge sharing in educational institutes at the time of pandemic. The point is that during COVID-19 pandemic, disseminating and sharing of knowledge is a competitive advantage that should be considered.^[19]

In spite of the importance of sharing pedagogical knowledge, the researcher's investigation showed that no study has so far investigated the pedagogical knowledge sharing in clinical education. Therefore, the present study was designed to find out the pedagogical knowledge-sharing strategies in clinical education and

it's changing during the pandemic when there are fewer interactions among individuals.

Materials and Methods

Study design and setting

The present study was a qualitative content analysis research conducted at Birjand University of Medical Sciences in 2019. Qualitative study methods try to discover and understand the people's inner world. Since experiences comprise the truth structure for any person, it is possible only by entering the people's lived world to discover the meaning of different phenomena from their perspective.^[20] Hence, in the present study, the phenomenon is explained using in-depth inspection of experiences and behaviors of people in the real life.

Study participants and sampling

Twenty-seven clinical instructors participated in this study. The criterion to include participants was at least 2 years of experience as clinical instructors, sufficient experience in medical education and teaching during the COVID-19 pandemic. The samples were first selected by purposive sampling. Next, the theoretical sampling was done with the maximum diversity in accord to clinical fields of study. To do so, an attempt was made to choose instructors from different fields of clinical practice including nursing, medicine, prehospital emergency, and dentistry.

Data collection tool and technique

To collect data, semi-structured interviews were done. The researcher and interviewees met at the time and place of the interview, which was determined after their verbal consent to participate in the study. After obtaining the informed consent, the interviewer asked the following questions: have you ever had the experience of sharing knowledge in the field of teaching and learning? have you ever seen the sharing of knowledge and experience of other colleagues? if so, how was it done? has COVID-19 influenced sharing knowledge? If so, how? To investigate further, the following explorative questions were asked: would you explain further? would you please give an example?.

The time of each interview was 35–120 min and all interviews were recorded with the permission of participants. Sampling continued until saturation level when no new information was provided.^[20] Data analysis was done through content analysis, according to Graneheim and Lundman, which included the following steps: (1) transcribing the narrative after every interview, (2) reading the entire transcription to get a whole understanding of its content, (3) identifying meaning units and initial codes, (4) classifying similar initial codes in more general categories, and (5)

identifying the implicit content in the data.^[21] In this study, to verify the results along with credibility, transferability, dependability, and confirmability, the Lincoln and Guba's criterion^[20] was used.

Ethical consideration

Ethical considerations, including previous coordination and permission to participate, explanation of the study aim, interview method, participants' rights to participate/avoid in the study or leave it when he/she wants, acquisition of informed consent for participating in the study and record the conversations, and assurance to participants about the confidentiality of their information were observed. Code of ethics was granted by the National Committee of Ethics of Biomedical Research of Iran (IR.BIRJAND.1398.002).

Result

Participants of the study consisted of 27 participants. All participants were involved in clinical activities and were interested in educational fields [Table 1].

In the present study, we distinguished five pedagogic knowledge-sharing strategies including peer helping, clinical education workplace, use of cyberspace, student mediation, working teams, and scientific communities. According to the findings of this study, COVID-19 was a facilitator and a culturalization factor in sharing knowledge. Lack of shared content management, lack of compliance with needs, and dispersion of content were considered as the barriers to pedagogic knowledge sharing during the corona pandemic [Table 2].

Pedagogical knowledge-sharing strategies in clinical education

Sharing pedagogical knowledge in clinical education is a diverse phenomenon and could be seen in a range of educational activities. Based on their experiences, the participants described their sharing strategies as follows:

Sharing in clinical education workplace

In clinical education, pedagogic knowledge instructors share knowledge in educational processes, namely joint round, ground round, morning report, outpatient education, case report, patient visit, etc., Therefore, it can be claimed that pedagogical knowledge-sharing opportunities are not limited to formal sessions of

sharing knowledge. One participant said, *"Something that helps a lot, is the morning discussion sessions..."* (Participant no. 11).

Students as mediating force of pedagogical sharing

According to participants, indirect or implied strategies for sharing pedagogical knowledge sharing (e.g., students as a mediating factor) could provide a way for pedagogical knowledge sharing. For example, by stating the problems of other classes or complimenting on one class and so on, students transfer the knowledge to instructors.

Another participant suggests that *"I learned a lot of things from students, such as communication skills. Students often complained that this guy is like this. This guy behaves like that. I felt that this kind of behavior really annoys the students. I realized that communication skills are more important."* (Participant no. 9).

Peer helping

Peer helping means helping each other through expressing experiences, offering weaknesses and strengths, and providing comments and suggestions by peers. People share their thoughts and ideas by peer helping. As a pedagogical knowledge-sharing strategy, it could be done by sharing experience in forums, lesson study, peer evaluation, etc., About peer evaluation one participant mentioned that *"my friends and I held a workshop. Afterward, we discussed our problems. We offered some feedback: It would be better if you had said this or if you answered this way, this slide had a problem, and this part of the slide would take less time if put in this way. Feedback like this is good."* (Participant no. 20).

Scientific communities

Scientific communities include professional meetings regarding pedagogic knowledge, such as educational workshops, medical education congress, in-university conference, webinar, video conference, professional/specialized conference, and medical education journal club. According to participants, attending these scientific communities is considered as critical pedagogical knowledge-sharing and idea exchange strategies. Furthermore, these communities strengthen the social interactions. Educational workshops – similar to seminars and conferences – could provide an opportunity for learning from colleagues and sharing knowledge and experience. If held appropriately, educational workshops would result in obtaining updated knowledge and experience. In this way, people could enhance their knowledge and capabilities by incorporating what they have learned. In this regard, one participant said, *"I participated in a assessment workshop. At the first session. I introduced this method of question construction to all colleagues."* (Participant no. 13).

Use of cyberspace

The use of virtual networks, besides the saving of cost

Table 1: Demographic of the samples

Participants	n	Sex		Mean teaching experience (years)
		Woman	Man	
Clinical medical professors	19	12	7	7
Nursing/operation room/ emergency medical professors	5	2	3	6
Dentistry professors	3	3	0	3.5

Table 2: Main categories and subcategories

Common themes	Main themes	Marginal themes
Knowledge-sharing strategies	Use of cyberspace	Web, Wikipedia, Instagram, website, bureaucratic correspondence, social media, and e-mail
	Clinical education workplace	Case report sessions, medical education round, ground round, mutual morning report, and mutual patient visit
	Peer helping	Peer evaluation, lesson study, experience sharing sessions with colleagues, and question and answer session
	Working teams	Formation of working networks, joint educational sessions, intersectoral education, and department sessions
	Scientific communities	Educational workshop, exclusive knowledge-sharing meetings, congress of medical education, in-university conference, webinar, video conference, professional/specialized conference, medical education journal club, publication in scientific journals, and report of scholarship of teaching in the festival
	Student mediation	Students' sharing of their experiences in other classes, introducing of the best method of education, talking about the educational deficiencies in other classes, and stating the educational problems by students
Coronavirus	Roles	Knowledge-sharing facilitator and knowledge-sharing culturalization factor
	Barriers	Lack of shared content management, lack of compliance with needs, and dispersion of content

and time in sharing knowledge and ideas, facilitates pedagogical knowledge transfer. Participants referred to a number of technology tools in which access to pedagogical knowledge and its management is provided in an efficient way. As well, interpersonal interactions and knowledge exchange are possible to a large extent.

One participant said, "My colleagues and I usually discuss the difficulties of education using WhatsApp and telegram. Any person gives a solution." (Participant no. 10).

Working teams

Another strategy used for pedagogical knowledge sharing by instructors is the network or working teams. Working teams are social groups comprised of instructors involved in a common activity. These groups provide an ideal place for knowledge generation and transfer. Knowledge that is shared might be an explicit knowledge, such as educational department meetings in which instructors share their knowledge.

These working groups could be a number of experts in various fields of study, which form a job network. In this case, knowledge is transferred implicitly and even in some cases as a mixture of implicit and explicit knowledge. Participant no. 15 stated that "attending in some sessions in which other departments are also present, especially the departments with similarities, for example, psychology, neurosurgery, and neurology, there might be some more opportunity for mutual cases."

COVID-19 and its impact on pedagogical knowledge transfer

In this case, two subcategories were extracted: COVID-19's roles as well as the barriers of pedagogical knowledge sharing in COVID-19 pandemic.

The role of coronavirus as a culturalization factor

Participants referred to COVID-19 as the "cultural

paradigm shift era of sharing knowledge." They claimed that the cultural barriers, which were existed before the pandemic (e.g., lack of acceptance of other people's knowledge, fear of sharing, self-centeredness, and individualistic setting), were undermined. Instead, the attempt to share knowledge using cyberspace was intensified.

"In my opinion, if you share your experience in cyberspace, nobody would assume that it is self-expression and so on. We can even use our colleagues' experiences" (Participant no. 5).

"I feel that corona has destroyed the competitive atmosphere. It seems that people want to help each other. Everybody shares their experience using the software. In case of any problem in virtual education or software errors, everybody wants to help." (Participant no. 19).

Coronavirus as a facilitator

According to participants, due to an increase in cyberspace use by instructors, knowledge sharing at the time of pandemic was accelerated. One participant said, "In the past, if you wanted to participate in a workshop of a famous lecturer, you had to go to a festival. You could take part, if you had the chance. Now, I have a quick access from the hospital without any interruption in my job and life. I can easily participate in a webinar." (Participant no. 1).

Barriers of knowledge sharing during the pandemic

Participants claimed that there are some barriers to share knowledge in cyberspace during the pandemic, namely lack of shared-knowledge management, lack of compliance with needs, and dispersion of content. They also believed that the open space to share knowledge during the pandemic has led to a huge amount of shared knowledge. However, for a lack of knowledge management, instructors sometimes have difficulty using it. According to one participant, "It is true that

corona helped us accessing to the teaching knowledge, but there were many materials as well as webinars which were shared in various groups that cannot be used. For example, everyone who teaches a software about producing electronic content should discuss the pros and cons of the software and make a comparison. In this way, each one, based on his/her need, could choose to learn and use it." (Participant no. 5).

Discussion

Findings of this study indicate that many strategies could be used in sharing pedagogical knowledge. These strategies provide considerable knowledge related to education for the instructors. Aside from the professional development of instructors, it results in the generation of new knowledge and increases mass learning. Verlmolen *et al.* (2014) argued that sharing knowledge is a learning activity, in which instructors become professionals and assist their colleagues' professional development.^[22] At the time of the pandemic, by an emphasis on using cyberspace, despite the existing barriers and limitations, it was regarded as a facilitator and a culturalization factor, which were emphasized in some studies.^[18] In addition, along with the findings of this study, Matzat (2013) showed that integration of online and offline methods provides more interactions between instructors and knowledge sharing among them.^[23] We found in the present study the use of cyberspace as a knowledge-sharing strategy. In line with the findings of our study, Ansari and Khan (2020) stated that online social media paves the way for cooperative learning.^[24] Social media could enhance pedagogical knowledge^[25] as well as sharing pedagogical knowledge.^[26]

It was found that all clinical education workplaces could be used for sharing knowledge. Instructors learn from each other in clinical encounters. However, the clinical setting has not received enough attention.^[27] Therefore, officials should have a plan to promote clinical instructors in a way that they are engaged in observational tasks. Since there is no better alternative than prescription of educational solutions relevant to problems, they cannot understand.^[28]

Another finding of this study was the use of working team strategy. In agreement with these findings, other researchers suggested that working teams could help instructors to share knowledge.^[29] In this regard, in a number of studies, it was shown that working teams play a critical role in teachers' professional improvement.^[30] However, knowledge egocentrism which is a barrier to knowledge acquisition, makes this strategy difficult.^[29]

Authorities are expected to provide a context for clinical instructors for getting together informally and improving their teaching knowledge. Therefore, creating

spaces such as knowledge cafes could be helpful. Scientific communities as one of the knowledge-sharing strategies extracted in the present study have been emphasized in other studies.^[31] Moreover, it was found that peer helping could also influence sharing teaching knowledge. Similarly, Fluijt *et al.*'s study (2016) shows that cooperative teaching could result in sharing deeply held beliefs related to teaching methods and practical knowledge.^[32,33]

With this in mind, officials should have a plan to promote clinical instructors in a way that they are engaged in observational tasks. The reason for this is that there are no better alternatives other than prescribing educational solutions relevant to problems they cannot understand.^[27] In this regard, the Teaching Assistantship Program^[34] recommended.

Even though clinical education is a professional activity with a high level of interaction, our findings demonstrate that students act as a mediating force in pedagogical sharing so that they are referred to as "shadow activist knowledge network."^[35] However, they are usually ignored in the pedagogical knowledge-sharing process. In addition, it was shown that using scientific communities to share pedagogical knowledge is a common solution and used in many studies as an important pedagogical knowledge-sharing strategy.

Limitation and recommendation

This study was only conducted in Birjand University of Medical Sciences. This was the most important limitation of our study. Therefore, conducting similar studies is recommended at a larger scale including other instructors in other universities.

Conclusions

This research showed different strategies for sharing pedagogical knowledge in clinical education. According to the results of this study, in addition to creating scientific communities, educational leaders in Education Development Center should consider the use of other strategies to share pedagogical knowledge. They should also regard sharing knowledge as an important factor in the professional development of clinical instructors and see the COVID-19 threat as an opportunity to prompt knowledge-sharing culture. Furthermore, limitations in knowledge sharing in the pandemic era could be overcome by knowledge-sharing systems under the scientific observation of educational experts.

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Conflicts of interest

There are no conflicts of interest.

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