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Original Article

Exploring the barriers of utilizing theoretical knowledge in clinical settings: A qualitative study

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ABSTRACT

Objectives: Although effective performance in clinical settings requires the integration between theory and practice, there is a gap between theoretical knowledge as taught in the classroom and what the students experience in clinical settings. This study aimed to elicit and explore the barriers of utilizing theoretical knowledge in clinical settings.

Methods: A qualitative study was adopted with a conventional content analysis approach. Fifteen nursing and paramedic's students, faculty members and experienced nursing staff participated in the study. Data were collected by semi-structured individual interviews until data saturation and concurrently analyzed via MAXQDA 10.

Results: Five main categories emerged as barriers of utilizing theoretical knowledge in the clinical settings i.e. non-standard practices in clinical settings; lack of trust in clinical competence; lack of perceived professional support; insufficiencies in teaching and learning process; and differences between doing things in simulated and real clinical situations.

Conclusion: Transferring theory into practice in a structured manner requires professional support in the workplace, trust and the opportunity for direct experience, using valid and up-to-date knowledge by clinical staff and bridging the simulated situations with real life scenarios.

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What is known?

There are currently different medical education approaches for educating and training of medical and paramedical students, where there are numerous obstacles and pitfalls in clinical setting and health care centers for delivery of effective health care services.

What is new?

- Lack of trust in clinical competence and lack of perceived professional support could be slow down achieving to learning objectives in the medical sciences universities.
- Differences between educating in the simulated manner and real clinical situations and their consistency in practice need to be exploring more.

- Implementing and knowledge translating of theoretical approaches into practice especially in the medical education programs requires capacity building and competency of scholars and professionals in the academic settings and hospitals, and health care centers.

1. Introduction

One of the ongoing problems in clinical education is the gap between theoretical knowledge as taught in the classroom and what the students experience in clinical settings [1,2]. Although clinical education is considered to be the core of the medical education curriculum, the theory is the complementary component of practice [3]. Theory and practice are related [4] and the combination of theoretical and practical learning experiences enables students to acquire the knowledge, skills, and attitudes to provide optimum care [5]. Hence, effective performance in clinical settings requires the integration between theory and practice [6].

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The evidence shows that students in clinical learning environments are often unable to match the theoretical content learned in the classroom with what they are actually doing in practice and consequently, they cannot provide the care competently for patients [7,8]. There are numerous obstacles and pitfalls in clinical setting and health care centers for the delivery of effective health care services [9,10].

Although they may be capable in theory and able to discuss what they learned in the classroom, they cannot use this capability in a variety of health-related situations during internship [11]. Hence, in real clinical situations, they are unable to generalize from what they have learned in theory [12].

The earlier studies have shown some of the factors that contribute to theory-practice gaps such as system inadequacies, resource restrictions, lack of experience, poor workplace condition and the lack of collaboration of clinical settings and educational institutions with students' [4,13,14].

Although studies about theory-practice gap have been varied, most of these studies are conducted on nursing staff; hence the main gap of these studies is neglecting other persons such as trainers and trainees who have a central role in clinical teaching and learning. Moreover, experiences and understandings of the gap between what is taught in the classroom and what is practiced in clinical settings during internship have not been deeply described; therefore, this study aims to explore the barriers of utilizing theoretical knowledge as taught in the classroom and in the clinical settings, i.e. in situations where undergraduate students are possibly unable to transfer theoretical knowledge into clinical practice experience.

2. Methods

2.1. Study design & participants

A qualitative study with conventional content analysis approach was applied to explain if undergraduate students are able to utilize theoretical knowledge as taught in the classroom and the reasons/barriers for why they cannot. The participants were selected from the nursing and paramedic's students, faculty members and experienced nursing staff.

Also, faculty members and experienced nursing staff participated in this study. Purposeful sampling method with the maximum variation in terms of age, gender, experience in clinical fields and level of education was used. Fifteen individuals participated in the study that their demographic information is presented in Table 1.

The guideline of consolidated criteria for reporting qualitative research (COREQ) was used for providing this manuscript.

2.2. Data collection

Data collected by individual semi-structured interviews using an interview guide. The interviews usually began with a general question that formulated based on the main research question: 'What are the obstacles and problems of utilizing the theoretical knowledge as thought in the classroom in clinical settings?' and other questions were: 'Would you describe situations in which you have experienced theory-practice gap?', 'How does the gap affect you as a student?' 'Could you describe what factors facilitate to bridge the theory-practice gap?' And 'what can be done to reduce the theory-practice gap?'

Additionally, further explanations were also obtained based on responses of the participants and by asking complementary probing questions such as 'Would you please detail your explanation?' and 'explain your experience more, please'.

The time and place of the interview sessions were determined by the mutual agreement of interviewees and researchers. Hence, the places for interviews were in the hospitals and one of the university's free classrooms. Each interview lasted 50 min on average. All the interviews were recorded using a voice recorder for further analysis. The interviews were continued until data saturation, where the researcher begins to hear the same comments again and again and no new theme or idea emerged [15].

2.3. Data analysis

Each interview was considered as the unit of analysis. The interviews were recorded and transcribed verbatim and read repeatedly to achieve a sense of the whole. Then, the data were broken down into units of meaning that were extracted from the statements and labeled with conceptual names (codes). After this open coding, the codes were compared based on similarities and differences and grouped into categories. Each subcategory with similar mean was grouped as categories and categories are grouped as main categories [16]. MAXQDA 10 software was used to manage the textual data during the coding process.

2.4. Trustworthiness

This study applied the criteria suggested by Guba and Lincoln to evaluate the credibility of the data [17]. The prolonged engagement

Table 1
Demographic profile of the participants (n = 15).

Participant	Gender	Age (years)	Job	Job experience (years)
P1	Female	22	Paramedic's student	—
P2	Male	21	Paramedic's student	—
P3	Female	22	Nursing student	—
P4	Female	32	Faculty member	8
P5	Female	34	Faculty member	5
P6	Male	22	Paramedic's student	—
P7	Male	21	Paramedic's student	—
P8	Female	43	Nurse	17
P9	Male	22	Nursing student	—
P10	Male	24	Nursing student	—
P11	Male	42	Faculty member	18
P12	Male	21	Paramedic's student	—
P13	Male	22	Paramedic's student	—
P14	Male	31	Nurse	9
P15	Female	40	Nurse	15

with the participants, especially students, during the interview period helped to establish trust and a better understanding. Peer debriefing conducted to indicate our position toward data and analysis. Hence, the research team checked the interview data and findings at each step of the study. Moreover, analytic categories, interpretations, and conclusions were tested using member checks. All the steps followed in the research process were documented by the researchers to provide auditability and dependability of the data.

2.5. Ethical considerations

The ethics committee of Maraghe University of Medical Sciences (MRGUMS) approved the study protocol. The aim and process of the study were explained to the participants and written informed consent was obtained. The interviews were recorded anonymously using code numbers. The researchers had no tutor or teacher role with any of the participants.

3. Results

This study explored the barriers of utilizing theoretical knowledge in clinical settings. Five main categories emerged as the main barriers: non-standard practices in clinical settings; lack of trust in clinical competence; lack of perceived professional support; insufficiencies in teaching and learning process, and differences between doing things in the simulated world and real clinical situations. Each of these categories is presented and discussed below.

3.1. Non-standard practices in clinical settings

The participants believed that many clinical duties were performed using nonstandard methods. These prevailing conditions cause ignoring the up-to-date theoretical knowledge as taught in the classroom and thus, make students follow the non-standard methods of the staff in their clinical duties. The students should match their behavior with the current setting of providing care. Hence, using non-standard methods for conducting clinical practices is a popular routine in the clinical settings that affects the students' behaviors. In fact, the students find themselves trapped between the demands of their tutor for following standard methods and practicing nonstandard methods of clinical staff in real clinical situations. This concept had two subcategories:

3.1.1. System's resistance against applying theoretical knowledge

Based on the participants' experiences, using valid and up-to-date knowledge that the students gain from their colleagues in the clinical settings are associated with the resistance of the hospital's clinical staff. Clinical staff, due to various reasons, such as lack of time or facilities, would prevent the students from applying theoretical knowledge as taught in the classroom. This can be understood from the expression of one of the operating room students who states:

"Sometimes when we work based on the scientific evidence, the staff or the tutors would object. For example, for hand washing, they do not pay much attention. When we spend the time that has been mentioned in the textbooks for washing our hands, they would tell us to 'hurry up, that's enough, those principled methods are just for books.'"(P1)

3.1.2. Following non-standard clinical practices

According to the participants, the lack of commitment to use up-

to-date theoretical knowledge by clinical staff has influenced their behaviors. They believe that the clinical staff failed to use valid and up-to-date knowledge in the clinical settings. They also follow the prevailing conditions in performing clinical duties and match their practices with them. In explaining this idea, another operating room student said:

"The personnel does not comply with the texts' standards; for example, for putting on the sterile gloves, our professors told us that the closed-gloves technique is better, more sterile. But in the operating room, we saw that everybody, even the surgeons, use the open gloves-technique. When they don't comply with the principles, why should we."(P12)

In support of this idea one of the mentors said:

"We have had many classes for the students about optimum hand-washing techniques. But they never do that and not even hand rub properly. When challenged, they replied, when the staff does not perform it why should we. The standards are just for the textbooks, doing things in the clinical settings are different."(P5)

3.2. Lack of trust in clinical competence

Lack of trust in clinical competence was another reason that the participants mentioned as a barrier to apply theoretical knowledge in the clinical settings. This category composed of three sub-categories namely 'patients' distrust in the students' clinical competence', 'students' distrust in their own clinical competence' and 'tutors' distrust in the students' clinical competence'.

3.2.1. Patients' distrust in the students' clinical competence

This subcategory indicates the disagreement and resistance of the patients and their relatives for students to perform clinical duties. According to participants, they refuse to reveal private information and seek help from students when in need. One of the participants described his/her experience as: *"Once I enter the room, a patient's relatives would say that I should not come in. Go and tell the nurse to come and do the job. I would say that I am a nurse too, I know the job too, but the relative would not let me touch the patient."(P10).*

3.2.2. Students' distrust in their own clinical competence

The learners also doubted their own ability to apply the knowledge learned; hence they did not see themselves capable of performing duties independently. Some of the operating room students stated:

"I feel that I do not know enough. Maybe I will make a mistake. We are not experienced so it is better that an expert would come to help us. I do not have the self-esteem to perform the job; someone should be there to support me."(P2)

3.2.3. Tutors' distrust in the students' clinical competence

Distrust in students for performing some of the procedures independently deprived them of experiencing directly and prevented them from practicing their learned knowledge. Some of the instructors would prevent the students from performing the procedures for various reasons such as distrust in students' clinical competence and observing students' fear and distrust in them. This would make students miss opportunities for gaining experience and learning clinical skills.

In explaining this, one participant said:

"They do not trust the students and do not give them duties. Our tutor always used to say that go to the patient and prepare the drug but do not inject until I come. Do not perform venipuncture until I come. I have had never worked independently until my 7th semester."(P3)

3.3. Lack of perceived professional support

This concept refers to the role of support that the learners would receive from their instructors and clinical staff in their performance. The students define support as respectful communication in clinical settings. To them, support was the product of respectful communication and being accepted by their tutors and clinical staff. The participants believed that the lack of a supportive environment and friendly relationships in the clinical settings is an important barrier in using their theoretical knowledge into practice.

3.3.1. Lack of support by the tutors

Receiving little support from the instructor and their aggressive behavior toward the student in the case of occurrence of any mistake was another reason that participants mentioned in their experiences:

"We had a tutor that would observe our work and then mention our mistakes in front of the patients loudly with a humiliating tone. Sometimes when the students had made mistakes, the instructor had yelled at them and got angry. Then, that student said that he would not do the job." (P3)

Moreover, the absence of the instructor along with the learners or their ineffective presence has made the students not receive the necessary support for working in the clinical setting, being ignored by the clinical staff and their inability to practice their learned knowledge. One of the nursing students stated:

"During the four semesters that we went to the hospital, we did not have an instructor. We were just observing. This threw us really backward. We wanted to work but we were told that since your instructor is not with you, you might make a mistake. So they would not allow us to work. Therefore, we had no opportunity to practice our learned knowledge."(P9)

3.3.2. Lack of support by the clinical staff

Inappropriate behavior of the clinical staff with the students and humiliating them among the colleagues was another barrier to trust-based interaction and motivating to perform duties in the learners. The participants had unpleasant feelings such as being rejected and not being accepted in their independent clinical performance decreases their motivation to gain experience and competence in clinical settings. Some of the students mentioned their experiences:

"Their behavior is not good. They see us as a newcomer student who does not know anything. For example, once I went to the operating room and started unpacking; the doctor told me do not touch anything, you should not touch anything. That day, I just stood and watched."(P2)

3.4. Insufficiencies in the teaching and learning process

This concept reveals the challenges of teaching and learning

process in theoretical and clinical education. The lack of enough preparation for clinical work would make the learners unable to use theoretical knowledge and practical skills in providing care for patients. This category has four subcategories as follows:

3.4.1. Insufficient theoretical knowledge

Lack of mastery in theoretical knowledge was another reason that would lead to students' inability to utilize what they have learned in the classroom. This can be understood from the expression of participants:

"Many of the students don't know enough about anatomy; for instance, in suctioning, one of my friends did not know where the trachea was."(P3)

One of the tutors said:

"The students do not have theoretical knowledge. For example, to perform venipuncture, they just know its procedure, but they do not know about the type of the vessel that is a superficial or a deep vein." (P11)

3.4.2. Insufficiency of learning opportunities

Lack of diversity in clinical cases in the hospital has limited the opportunities for learning. In this regard, one of the instructors said:

"In the hospitals of the small town, clinical cases are few. I was talking about hemorrhage to the midwifery students. But these cases are so rare here so the students could not see many cases in clinical settings." (P15)

Also, the lack of facilities and equipment for applying the learned theoretical knowledge in the simulated situations would deprive the students of the opportunity of learning and transferring their theoretical knowledge into practice.

"Our skill lab was not equipped. We just went there for injections; about that, there was only one medical manikin and only one or two of us could work on it. The others would not get a chance." (P6)

3.4.3. Inefficient educational program

Weakness in the planning and implementation of the educational programs and curriculum has disturbed the process of teaching-learning. According to the participants, inappropriate timing and long intervals between the theoretical and practical courses is a notable problem that affects the transfer of theoretical knowledge into clinical fields.

In supporting the long interval between the theoretical and practical courses, one of the operating room students mentioned:

"Suturing and tying were taught in the first semester. But the first semester is not the time for this because we still have not even seen a suture thread. We have not been to surgery. They should be simultaneous. We passed the course during the first semester and in the fourth semester, we went to practice suturing. Well, we all forgot everything by then."(P9)

Moreover, some of the participants believed that the curriculum had not been updated appropriately based on the needs of the work in clinical settings. This was expressed in the participant's own words as:

“... our curriculum isn't updated. We should revise our curriculum particularly for specialized lessons according to the needs.” (P4)

3.5. Differences between doing things in simulated and real clinical situations

Participants believed that there was a difference between the nature of learned knowledge in the simulated educational environments and the real practice in clinical settings; in a way that, even by practicing the procedures in simulated situations, they would encounter cases in the real clinical environment which could not be learned by practicing in unrealistic situations on a manikin in the skill lab. This is reflected in the ideas of one of the nursing instructors who expressed:

“In the skill lab we have general clinical procedures, so some things could not be taught there. No matter how well we work with them in the skill lab, we could not portray emergency situations for them.” (P5)

According to the participants, theoretical topics and practicing on the manikins had a subjective nature and is different from working in clinical settings. One of the operating room students said:

“The condition of the clinical setting is different from the skill lab. Books have presented a general topic that could not be applied to all of the patients. For example, about suturing, the book has said that the depth should be one centimeter; you should take this depth and make the suture; but in old patients, or patients who are addicted or smoke cigarettes the skin is different, if you make a suture with a one centimeter depth the skin might rupture. So you cannot perform the technique that you have learned in the theoretical classroom here.” (P13)

On the other hand, the stressful nature of the clinical settings has made the clinical experience fearful and stressful for the learners. According to the participants, dealing with the patients' lives in clinical settings is a reason for being afraid and stressed while working in real situations. One of the operating room students stated their experience as:

“I can make sutures on the chicken's skin so easily. But during the operation, it is a patient you are dealing with and the patient's life. It is very stressful especially in high risk and invasive procedures.” (P12)

Moreover, emergency situations in clinical settings would increase the students' stress and would prevent them from linking their learned knowledge to practical realities:

“Emergency situations are so stressful. They would affect our performance. You would feel panic at that moment and not know what you should do.” (P7)

4. Discussion

The study explored the barriers of utilizing theoretical knowledge in clinical settings. One of the most important reasons identified for the gap between theoretical knowledge and what the students experience in clinical settings was following the non-standard methods of the staff in performing clinical practices.

Traditionalism in clinical practice is a challenging factor in students' learning. Having to follow prevailing conditions in performing clinical duties and not using the updated lessons taught by academic tutors affected the students' performances. This makes the students prefer not to take much effort to use evidence-based practice learned in the classroom [18].

A similar study reported that clinical staff emphasized getting the work done realistically based on the prevailing conditions and without compliance with the standards in the clinical settings [19]. Similarly, promoting the use of up-to-date knowledge depends on the support of key persons in the system.

Hence, continuing education programs designed to strengthen the scientific competence of the clinical staff that has a critical role in students' development of competencies may impact structures and behaviors in these settings.

Another reason that participants explained about the theory-practice gap was the lack of trust in clinical competence. Three levels of trust are related to this concept. One is the trust that patients had with their care providers.

This finding is consistent with the concept of the care provider-patient relationship. Extensive research has shown the importance of trust between patients and their care providers [20].

Trust has been shown to be a critical factor that influences a variety of important therapeutic processes; patients with higher levels of trust in the technical competence of health care providers are more likely to accept and adhere to therapeutic recommendations and satisfy with medical care.

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Other levels of trust were students' distrust in their own ability to provide clinical services. This finding is consistent with the self-efficacy theory. Self-efficacy is defined as ‘people's judgment of their capabilities to organize and execute the courses of action required to attain designated types of performances’ [22]. More importantly, increased self-efficacy has been linked to improved academic success and professional practice behaviors [23].

Moreover, tutors' distrust in students' clinical adequacy causes them to doubt that they can experience and perform clinical procedures adequately. This finding is consistent with a study that shows confidence in students to do a job independently promotes the application of theoretical knowledge to real-world clinical contexts [18].

Further, it can be argued that the theory-practice gap in the research setting was largely due to the lack of supportive environment in clinical settings that decreases student motivation to use theoretical knowledge as taught in the classroom in practice and thus gain more experience.

A supportive clinical environment can significantly improve the students' motivation and their professional performance. Also, appropriate respectful communication with the students gives them a feeling of being important and reinforces their motivation and individual identity during clinical performance [24,25].

Moreover, the presence of an effective instructor that supervises the students' clinical performance could create a supportive clinical training environment. Evidence shows that effective clinical

supervision can significantly increase the students' motivation, strengthen their professional identity, enhance the ability to make the connection between knowledge and practice, induce them a feeling of being supported and improve their attitude towards their professions [26]. Clinical supervision should be a process that encourages and supports improved professional practice [5].

Insufficient theoretical knowledge was another factor that affects the students' performance in clinical settings. In order to properly practice in clinical settings, learners need to understand the basics of theoretical knowledge such as anatomy and physiology. Without mastery of theoretical knowledge, one cannot truly understand what he/she is doing and why they are using a particular procedure.

Yong argued without theoretical knowledge as the base, practical knowledge has no potential to sustain [27]. Therefore, the option should be consolidating theoretical foundation and simultaneously taking part in practical jobs to accelerate the combination of two kinds of knowledge [28].

Using problem-based learning, compared to the traditional approaches such as lecturing, is a more effective approach in increasing the level of knowledge and promoting critical thinking and problem-solving [29]. Moreover, the students need the opportunity to implement theoretical knowledge in the learning environments with new techniques and equipment for dynamic and complex medical situations to be practiced and managed.

The general lack of resources in an atmosphere of systemic inadequacies has been a challenge for knowledge transfer [29]. Another challenge emerging for researchers in the research setting was the difference between real practice in clinical settings and the experience that the learners had in the simulated educational environments.

The nature of the clinical settings is stressful, especially in emergency conditions. Some clinical tasks and emergency conditions are not easily simulated [30]. Fero et al. have demonstrated that simulation does not necessarily increase students' ability to think critically [31].

Dealing with the patient's life, the limited time of patient care in situations such as death, and dealing with terminally ill patients enable them to convert what they learnt in theory into practice. The studies showed that a hospital is considered to be one of the most stressful working environments.

Although simulated educational environments are safe settings within which learners can repeatedly practice a range of clinical skills without endangering patients, it can operate in isolation from their clinical context, ignoring the learning needs of individuals within a real health care environment. Hence, simulation must be used alongside clinical practice and linked closely with it [32].

As the findings of this study have suggested, the following measures should be at the forefront of the nurse tutors' agenda when teaching student nurses. Links must be forged between theoretical knowledge and its practical application in the wards. This means that student nurses, even during their theoretical allocation, should be given time to at least observe the practical application of what is taught in the real nursing world of the ward. Techniques that caused the greatest concern were, building trust in clinical presence, supporting the learning process, following the concept of evidence-based practice, encouraging an enthusiastic learning environment and tackling the gap between simulated and real clinical situations.

The strengths of this study involved the inclusion of participants in disciplines who have clinical education and affect the process of patients' care such as operating room and medical emergency trainees' moreover the nursing students. Lacks of access to newly qualified professionals were a limitation of this study.

5. Conclusion

This study attempted to explain the barriers of using theoretical knowledge as taught in the classroom into clinical practices. The implementation of learning demands a workplace structure composed of genuine professional support, trust and the opportunity of direct experience, using valid and state-of-the-art knowledge by clinical staff in order to bridge simulated situations with real life. Hence, elimination of barriers requires improving the cultural, educational and professional settings where students are both taught and practicing.

Conflicts of interest

The authors have no conflict of interest to declare.

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Authors' contribution

Mina Hashemiparast and Reza Negarandeh provided research proposal and final report. Mina Hashemiparast has done the data collection and analysis, and manuscript provision. Dimitrios Theofanidis also participated in manuscript provision. All authors read and approved the final manuscript.

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Appendix A. Supplementary data

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