



Using newly deceased patients in teaching clinical skills: its ethical and educational challenges

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> Abstract

Introduction: The newly deceased patients have long been used in medical schools to teach clinical skills without any challenges as it helps to train skilled doctors. Nowadays, the use of moulages and simulators are common in teaching clinical skills since these tools provide the opportunity for frequent practice without any pain and injury. There are specific procedures which still require the use of cadavers. However, the increased significance of patient rights has generally challenged the practicality of using the deceased bodies for this purpose. This study was designed with the aim of determining to what extent clinical skill training is dependent on the recently deceased patients.

Methods: This was a cross-sectional mixed-method triangulation design conducted in two phases. In the first phase, a researcher-made questionnaire was used to collect quantitative data of the medical students and residents. The data were used to assess the frequency of experience. In the second stage, semi-structured interviews were conducted with faculty members and fellows in order to evaluate the educational impact of this type of procedure and the influential factors. The quantitative data were analyzed using statistical software, and the qualitative codes were extracted following a content analysis. Finally, a comparative analysis was performed.

Results: Twenty five residents (26%) and seven medical students (14%) had the experience of performing procedures on the recently deceased patients for training purposes. About half of the residents and 33% of the medical students had observed their colleagues practicing procedures on cadavers. In the qualitative phase, the main categories included professional ethics, law and educational requirements.

Conclusion: A relatively low number of medical students and residents had experienced procedures on the newly deceased patients. In this regard, ethical, religious and legal concerns might have played a part despite the desire to learn. It would be effective to direct these educational experiences toward procedures that cannot be mastered through moulages and simulators, and to lay the legal and executive ground so that performing these procedures under the supervision of professors, and with a level of documentation would have no legal challenges.

Keywords: Cadaver, Learning, Clinical skills, Ethics

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Introduction

Practice of clinical skills and procedures on the deceased patients dates back to a long time ago (1-3). Endotracheal intubation, surgical venous cut down and chest tube insertion are but a few examples of common procedures practiced by medical students and residents under supervision on deceased patients. There have been a lot of debates around this matter in terms of ethics, personal and familial consent and respect toward human corpses. However, since training experienced doctors is vital to public health, there hasn't been much challenge against the use of corpses for educational purposes (4, 5). In recent years, moulages and simulators have been widely used in training programs to teach clinical skills (6, 7). Animal labs have also provided the opportunity to practice certain procedures. These environments make it possible to train medical students and residents on clinical skills without any concerns for pain or injury (8). However, some specific procedures still require the use of recently deceased patients (9).

Nowadays, with increased attention to the patient rights, importance of patient autonomy and increased number of requested post-mortem examinations, medical students and residents are less interested to perform procedures on newly deceased patients for training purposes in comparison to the past. This has fundamentally reduced the viability of considering these cases as a teaching opportunity.

Most previous studies have generally presumed these procedures as common and have addressed such issues as familial informed consent and ways to obtain it, the effects of this consent on public health in the society and ethical concerns of practicing such procedures (10, 11). A few studies have compared the educational quality in performing these procedures on simulators and newly deceased bodies. However, there are a limited number of studies in Iran in this field, and none of them has addressed the questions we raised in this study (12, 13).

This study was designed with the aim of determining whether gaining experience in clinical skills generally requires performing procedures on a recently deceased patient and answering the following questions: What percentage of medical students and residents have experienced these kinds of procedures? What are the educational impacts of these procedures? What type of learning experience do these procedures provide? And finally what are the influential factors in performing these procedures?

Methods

Overall study design

This is a cross-sectional mixed methods study on the "practice of medical procedures on recently deceased patients". Triangulation, one of the most common mixed methods designs, presents a rich field to combine different types of information. This design involves collection, analysis and integration of qualitative and quantitative data in the course of one study and can provide a profound understanding of the problem (14, 15). In this regard, combining the qualitative and quantitative data obtained in a large scale is in line with our study, and this encourages more generalizability. The present study was conducted in two stages. The first stage involved obtaining quantitative data that evaluated the current situation through a researcher-made questionnaire, and the second stage consisted of semi-structured interviews aiming to analyze and complete the information obtained in the first stage.

Quantitative phase

The first phase involved obtaining quantitative data provided by medical students and residents through a researcher-made questionnaire. First, the key concepts were identified based on the study hypotheses and a review of the literature. A 21-item questionnaire was designed containing demographic information, performance or witness of procedures on cadavers, working conditions, informed consent and educational effects. A qualitative approach was used to assess the face validity of the questionnaire. In this regard, seven residents were interviewed. The level of difficulty, ambiguity and proportion were evaluated and corrected. To ensure content validity, we made use of expert judgments; 10 experts in the fields of medical ethics and clinical sciences presented their comments and based on their comments the items were revised. In addition, to measure the questionnaire's reliability, we conducted a pilot study on 30 residents and Cronbach's alpha was calculated at 0.7.

Our study population consisted of all residents from internal medicine, pediatrics, surgery, and emergency medicine groups who had passed more than one year of their residency, and the medical students who had passed more than one year of their clinical education. The sample size was calculated at 40 based on Cochran's Sample Size Formula; convenience sampling was used in this study.

Qualitative phase

In this phase, the data were collected through semi-structured interviews with the faculty

members and fellows of Shiraz University of Medical Sciences. Among the faculty members of the internal medicine, surgery, pediatrics and emergency medicine departments, we selected the ones with extensive experience in teaching medical students and residents, as well as having educational management experience; also, among the fellows, we selected those with clinical teaching experience who had performed procedures on the recently deceased patients. The semi-structured interviews were conducted by the leading researcher. The interview locations were chosen by the participants themselves, and the interviews were conducted in sessions lasting from 15 to 30 minutes based on an interview guide. The interviews continued until reaching data saturation. In the last two interviews, the respondents made similar statements. The conventional approach was used for content analysis. In this regard, the semantic units of information were identified and coded with suitable labels. These codes were categorized based on their similarities and differences.

Interview guide

The interview guide included some general questions related to the subject under the study, as well as three main questions regarding the findings of the quantitative phase. The professors and fellows answered all questions. The main three questions were as follows: In the current situation, and regarding our study findings, how do you assess the role of “procedures on newly deceased patients” in the students’ learning experiences? What factors affect the levels and types of these learning experiences? Is it possible to reach an acceptable level of clinical skill through using mouldages and simulators with no prior practice on cadavers?

Comparative phase

In accordance with our research objectives and questions, we did a comparative analysis of the quantitative information from the first stage and the categorized codes derived from the semi-structured interviews.

Trustworthiness

To ensure credibility and validity in the

qualitative section, it was vital to pay attention to its trustworthiness. To reduce the risk of losing significant information, full explanations were given and the interview transcripts were used in their entirety. At the end of the interviews, after transcriptions were completed, a copy was sent to each participant along with categories and subcategories, and the participants were asked to assess the author’s interpretations in terms of accuracy.

Ethical considerations

The participation of all students, residents and professors in this project was voluntary, and the completed forms and transcribed interviews were all anonymous.

Results

Of the 144 residents in internal medicine, surgery, pediatrics and emergency medicine, 97 (67%) filled out the questionnaire, and out of the 50 medical students, 41 (84%) agreed to participate in the study (Table 1). Twenty five residents (26%) and seven medical students (14%) had the experience of practicing procedures on the recently deceased patients; meanwhile, around half of the residents, and 33% of the medical students had witnessed these procedures by other colleagues and nurses in various teaching hospital wards.

Endotracheal intubation was the most common procedure performed, followed by chest tube insertion, with much lower frequency. Other clinical procedures were not frequently practiced. Despite the importance of cricothyrotomy, none of the residents or medical students had witnessed or performed this procedure on the newly deceased patients (Table 2).

Among the medical students and residents who had performed or observed such procedures, 16 (27%) stated that informed familial consents were taken prior to the procedures; 18 (30%) had informed the relatives, but couldn’t obtain their consent, and the others (43%) said that the relatives were either unavailable, (e.g. ICU patients) or uninformed. A significant number of the participants who had performed or witnessed these procedures (45 individuals, 76.8%) had

Table 1: The number and percentage of residents and medical students participating in the study

		Number	Percentage
Resident	Internal medicine	43	69.8%
	Pediatrics	22	
	Surgery	11	
	Emergency medicine	21	
Medical students		42	30.2%
		39	100%

Table 2: The type of procedures performed by medical students and residents

Procedure	Number	%
Endotracheal intubation	52	%76.4
Cut down	4	%5.8
Chest tube	7	%10.2
Cricothyrotomy	0	0
Pericardiocentesis	2	%2.9
Interosseous injection	1	%1.4
Other (Bone marrow, Abdominal)	2	%2.9

done so under the supervision of seniors, including residents, fellows and faculty members. Two medical students experienced it under the supervision of the interns.

The students and residents evaluated their experiences from two different aspects: emotional and educational. 39 participants (68%) considered the procedures as a successful learning experience (Table 3), and from an emotional viewpoint, 30 individuals (52%) stated that the experience was emotionally unpleasant.

Twelve fellows with a mean age of 38.2, and six faculty members with a mean age of 44.3 participated in the qualitative section of our study. The influential factors on performing

procedures on a newly deceased patient with the aim of teaching included 3 categories of professionalism, law and educational needs, and 8 subcategories, a summary of which is presented below (Table 4).

Professionalism

Professionalism is defined as a commitment to ethical codes and professional standards; in other words, it is adherence to moral values during educational and healthcare activities. This was a basic concept frequently mentioned by the participants as an effective factor in performing or not performing the procedures on the recently deceased patients.

Table 3: Emotional experience of medical students and residents during practicing procedures on the newly deceased patients

	N	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
Performing the procedure gave me satisfaction	59	6	8	6	11	28
It was an unpleasant experience	52	8	12	2	13	17

Table 4: The category, subcategory and meaningful units

Category	Subcategory	Meaning unite
Professionalism	Respecting the individual	When we were performing procedures on cadavers, we would act as if it was a live person. That is, we would perform with total respect and in accordance with relative guidelines.
	Proficiency and clinical skills; "an aspect of professionalism"	During my internship, I learned to perform procedures such as CVP, and cut down on deceased bodies. I learned those skills through perseverance because of my belief in being a good doctor...
	People's trust	Making this matter a public affair would have negative effects on society's peace and trust...
Law	Sharia	What? Performing medical procedures on a deceased body? No! Never! It's forbidden! Forbidden!! (Haram)
	Forensics and liability	It has happened that I perform a procedure on a patient who doesn't need it so that the sequence of medical interventions would be complete and we wouldn't have to give answer to forensics; but we wouldn't perform such procedures only for teaching purposes. never...
Educational needs	Learning experience	Although there are many additional problems to it, when you perform an LP on a cadaver, it's just like performing it on a live person. It's a complete experience; CSF is collected and you can feel the needle puncturing the dura; therefore, the next time, when you want to perform an LP on a live person, you'd be more confident and less stressed; moreover, no live patient has to suffer any pain in the process.
	Willingness to learn	If the students are interested and proper conditions are met, I consent. Although medical students learn CPR and intubation in the skill lab and anesthesiology department to a sufficient degree, we can consider it for procedures such as cricothyrotomy, for which there is no opportunity to practice.

Respecting a person:

In our participants' opinion, performance of procedures on newly deceased patients requires complying with ethical and clinical standards. Students, residents and professors must perform the procedures as if it is on a living person, i.e. they shouldn't act disrespectfully towards the deceased.

"... I always ask my students to act in such a way that if a third party walked in, he/she wouldn't be able to tell that the procedure is being performed on a deceased body".

"I have performed these types of procedures on the newly deceased patients, but whenever I did it I said blessing for the deceased soul (Fatehe)..."

Competency in clinical skills:

Medical school graduates, whether in general medicine or clinical residency, need to be competent in clinical skills. Although we cannot definitely say that procedures on the deceased are necessary, we must admit that all skilled doctors, even great surgeons, have had frequent experiences with such procedures.

"...Most expert clinicians, especially surgeons who have ample clinical practices, have experience in these types of procedures".

Trust:

In these procedures, we must always take other patients and their relatives into account. If the deceased patient is in a 6-bed hospital room, and other patients are present, it would be impossible to perform any procedures, since it would disturb their peace and tranquility. In addition, the patients lose their trust in doctors. Meanwhile, if the patient is in an ICU or a single or double-bed room, it would be possible to perform such procedures.

"At the present condition, people's trust is the most important issue; therefore, performing these types of procedures is practically impossible..."

Law

Another category in our qualitative study was the law, as mentioned by the participants. In this section, law refers to civil and tort laws, which deal with crimes and violations, as well as Sharia (Islamic divine laws) as instructed by Shia Faqihs (Islamic jurists). This category was identified by our participants to have effects on the behavior of doctors and medical teams.

Sharia:

A number of participants emphasized a jurisprudential-canonical approach to the issue and believed that unless Fiqh (Islamic jurists) allows the performance of procedures on the recently deceased, this kind of teaching experience would be impossible.

Forensics:

According to the participants, many procedures can be practiced under these conditions, but the reason that students choose to practice endotracheal intubation, despite comprehensive training on the procedure, is that it leaves no trace on the body. In contrast, cricothyrotomy, a more important procedure that can save lives in difficult situations and so should be a better choice, is rarely practiced since it requires making incisions in the skin and tissues, which can later be investigated by the forensics department. Therefore, if performance of procedures on the recently deceased patients was to be legalized and documented, this would no longer be an obstacle.

"... in a teaching hospital, it would be possible for a resident to perform cricothyrotomy on a newly deceased patient under my supervision as a professor if there were regulations for documenting the work so that it wouldn't cause any problem. Of course, this requires the existence of established laws."

"... through culturalization, we can make the process of obtaining consent for procedures on the deceased similar to taking consent from an organ donor; or, we can even turn it into a law presuming consent from everyone, and if there are any opposing parties, they can state and submit their objection individually; in other words, opt-in consent can be turned into opt-out consent."

Educational needs

Educational needs are the leading factors encouraging the students and residents to practice procedures on newly deceased patients with the aim of improving clinical skills. This category consisted of two subcategories: willingness to learn and learning experience.

Willingness to learn:

It is possible to practice on a moulage in order to reach a level of skill in key procedures in compliance with the basic educational standards of general medicine. However, for those interested in surgery or emergency medicine that requires a more advanced level of clinical skills, it is suitable or even necessary to perform such procedures on cadavers.

"... this educational need exists, even if most students don't feel the need and show no interest; we still should provide the opportunity for the less interested ones."

Learning experience:

Moulages present a fixed framework and lack the variations of a real anatomy condition; meanwhile, performing a procedure on a recently

deceased patient provides the closest conditions to a live patient in need of medical intervention. Therefore, it would lead to an effective increase in clinical experience.

"...Whenever I perform these types of procedures, I convince myself that by doing so my expertise will help to diminish pain and suffering in my future patients."

Discussion

This study evaluated the experience gained through procedures on the newly deceased in teaching hospitals, the factors influencing it, and its educational effects. The faculty member's viewpoints and general evaluation of the current state of these procedures were considered using a mixed methods triangulation approach.

About one fourth of the residents and a small number of medical students had experienced performing procedures on a recently deceased patient for training purposes, and less than half of the residents had witnessed the performance of such procedures by colleagues and nurses. Although the findings of the studies on this subject are controversial, the results of a study conducted by Denny and Kollek were in line with ours. The frequency of such learning experience was reported to be 27% amongst the university lecturers and 4% among the learners including medical students (16, 17). Ginfifer et al. reported a 46% prevalence of teaching resuscitation skills on the newly deceased patients in Australia's medical education centers (16). Results from Fourre's study on the condition of this learning experience in the USA indicated that almost half (47%) of the training program directors reported that there were indeed procedures performed on cadavers in their emergency rooms for teaching purposes (18). Meanwhile, the prevalence ranged from 47% in America to 4% in Canada. However, the British and Norwegian Medical Association guidelines have prohibited the practice of intubation on recently deceased patients (19). In line with our study, endotracheal intubation was the most prevalent procedure (16, 17).

The qualitative section of this study aimed to unravel the viewpoints of faculty members and fellows on the educational impact of this type of procedure and the factors affecting it. Under the effect of these factors, residents and medical students consider this kind of procedure as a useful learning experience, and either use it to learn clinical skills or avoid it. Belief in the burden of responsibility, possibility of undermining public trust, unique learning quality of these procedures, concerns about legal liability, and interest in improvement of clinical skills are the

leading factors affecting the prevalence and types of these experiences.

Professionalism was one of the main categories in this study. The respective subcategories included patient respect, competency in clinical skills and public trust. Procedures on recently deceased patients are affected by factors such as doctors and nurses' competency in clinical skills, calmness and trust among patients and respect toward individuals. There are no concerns when performing procedures on the deceased patients since the issues such as pain, suffering, mortality, and morbidity are oblivious. However, protecting the patients' autonomy and respect for human corpses are still controversial issues (20). In our study, the participants emphasized respectful behavior toward cadavers and some participants mentioned the necessity of senior supervision and adherence to professional standards. Moreover, there is also the matter of respect toward the wishes of the deceased and familial consent. Numerous studies have put emphasis on the substantiated commitment of medical teams to take formal consent from the patients' relatives (21-23). This study raised this issue as well. In this regard, the focus was on ways to obtain familial consent during the painful times of mourning.

In this study, there were also concerns about Sharia, as well as tort and civil law. Numerous studies have evaluated the ethical-legal aspects of performing procedures on the newly deceased. However, due to structural differences in the law and the necessity to consider jurisprudence in the legal framework governing the legislative system, we need to adjust the content of these studies to match Sharia principles. In this study, a number of participants believed in the guilt of these procedures and thought many learners refuse to perform such procedures despite the educational need for this exact reason. Legal concerns are another factor that profoundly affect the prevalence and type of procedures performed on newly deceased patients. Such concerns would incline the learners to perform these procedures in secret and not even bother acquiring consent from the relatives.

Educational opportunity was another category in this study. There is no mention of procedures on deceased bodies within the context of learning experience defined in the general medicine curriculum. According to the curriculum, clinical skills are acquired through practice on moulages and simulators. However, it is not possible to learn the complicated skills through this approach. Therefore, to avoid harming the patients in need, it is better to practice such procedures on recently deceased patients. In this regard, procedures such

as pericardiocentesis and cricothyrotomy are good examples. Numerous studies have found this method more effective than teaching through moulages and simulators and have considered it to have better clinical outcomes (24, 25). According to our participants, the interest of students and residents in learning clinical skills was one of the main reasons behind their inclination toward these procedures. In their opinion, certain levels of clinical skills can only be acquired through practice under such conditions. It is in society's best interest to train skilled doctors, and despite the ethical sensitivity of the matter, there aren't usually any serious obstacles to perform these types of procedures (26). Our participants stated several concerns that could be placed in this category. Of course, it is possible to say that this category answers the investigation of the educational impact since, from a holistic point of view, the educational impact is one of the factors in performing or not performing procedures on a recently deceased patient.

All ethical analyses justifying this type of learning experience have always based their justification on educational needs and society's best interest, as well as the low quality of moulages and simulators (4, 5, 11, 21, 27). When close to 70% of residents and more than 85% of medical students graduate without ever having such a learning experience, we need to seriously reconsider our initial reasoning. The medical education system does provide a level of educational efficiency using moulages and simulators, but to reach a higher level of clinical skills or competency in certain procedures, practice on cadavers is vital. Considering this presumption, we must also take the procedures which require making incision on the skin or tissue into account. Through constraints, we can prevent the procedures which can be practiced on moulages and provide the opportunity to practice more invasive procedures on deceased bodies in a limited and controlled fashion. Despite the mentioned changes, the methods and bases of ethical analyses will always be the same, and so will the educational needs, society's interest and inefficiency of moulages and simulators. Under these conditions, it would be possible to perform specific procedures under the supervision of professors and with a certain level of documentation. Nonetheless, this would require notifying the forensics department in advance. It is essential to lay the legal ground for management of such learning experiences, which would require collaboration and dialog with the Fuqaha in order to determine and describe the necessary principles.

Limitation

The most important limitation in this study was that we only had access to fellows, residents and medical students, and other fields of medical sciences such as nursing were not evaluated.

Conclusion

A limited number of medical students and residents had the experience of performing procedures on recently deceased patients to improve their clinical skills. Although moulages and simulators can be used to teach clinical skills, there are some specific skills which are more likely to be acquired through practicing procedures on cadavers. However, ethical, religious and legal concerns can affect this matter despite the learners' interests. It would be effective to direct these educational experiences toward procedures which cannot be mastered through moulages and simulators and to lay the legal and executive ground so that performing these procedures under the supervision of professors and with a level of documentation would have no legal consequences.

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