

Compliance of Iranian Perfusionist with American Society of Extracorporeal Technology Standards

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Received 2016 August 16; Revised 2016 September 06; Accepted 2016 September 25.

Abstract

Background: Standards play an important role in representing the minimum favorable and acceptable performance and are used in determining the exact current status of a hospital and evaluating and monitoring its performances. Standards also play an important role in providing quality services by perfusionists to patients undergoing open-heart surgery with heart-lung machine.

Objectives: This study aimed to analyze the compliance with standards related to perfusionists in Iran by comparison with American society of extracorporeal technology standards.

Methods: In this descriptive cross-sectional study, a questionnaire developed by the American society of extracorporeal technology standards was used to collect data from 48 Iranian hospitals and educational medical centers. The level of compliance with perfusion standards related to perfusionists was analyzed and compared with the American society of extracorporeal technology standards.

Results: The results showed that 45.52% of the centers were in compliance with factors related to standards of competence, qualification and backup staffing for critical situations. Only 23% of the centers complied with standards of perfusionists' interaction with the medical team, which indicates an unsatisfactory interaction between perfusionists and the medical team, and regarding the working hours only 18.5% of the centers complied with the standards in this area.

Conclusions: The comparison made between the compliance of Iranian perfusionists and the American society of extracorporeal technology standards reveals an unsatisfactory level. This suggests the need for development of accreditation programs and standards of care on one hand and conduction of a continuous evaluation of these standards on the other hand.

Keywords: Standard, Cardiopulmonary Bypass, Perfusionist

1. Background

Standards play an important role in representing expected performance and the least optimum level, determining the current status of the hospital, setting a goal, evaluation, training programs, supervising and directing the activities of the organization. They can also be used as a tools for evaluating the performance and efficiency of health centers and facilitate the decision making process (1, 2). On the other hand, standards lead to an improved quality of services provided by clinical staff. Clinical staff performance can significantly increase efficiency, effectiveness, productivity of treatment centers and satisfaction of patients. The heart surgery room is one of the sensitive sectors of health centers in which compliance with standards and personnel performance to provide quality service is a top priority (3, 4). Therefore, in order to ensure the safety and quality of services provided to patients in these sectors, formulation and implementation of professional standards for heart surgery room in general, and professional standards of cardiopulmonary bypass in particular, are essential. Professional standards guarantee the accountability of professionals regarding the performed actions, made decisions and their compe-

tence over their professional duties (5). Professional standards of cardiopulmonary bypass in fact reflect the adequacy and competency status at all levels of the process of using cardiopulmonary bypass. In fact, professional standards of cardiopulmonary bypass guide clinical practices and the aim of developing these standards is to provide guidance for perfusionists in order to reduce risks and side effects of cardiopulmonary bypass machine on the one hand and increase perfusion safety and the quality of medical services provided to the patients on the other hand (5). Perfusion safety and reducing the risks and potential complications in the use of cardiopulmonary bypass machine is a multidimensional issue, including a wide range of factors. This not only includes the equipment used in cardiopulmonary bypass, but also a process that involves the design and manufacturing of the applied methods of perfusion and surgical technique. In addition, this process includes factors such as perfusionists' education, awareness and knowledge on how to deal with events that may occur in the surgery room simultaneously that require proper and effective interaction between the surgeon, anesthesiologist, nurse anesthetists and perfusionist as well as the assessment of the provided care (6). The use of routine re-

ports of health care quality assessment provided in institutions and hospitals is widely accepted (7, 8) and it is the basis for increased safety and assessment of the adopted safety actions. Given the importance of compliance with standards and the staff performance across the organization, during the review of published studies in the field of compliance with perfusion standards, no study has addressed the state of compliance with professional standards of cardiopulmonary bypass in Iran.

2. Objectives

This article was extracted from an extensive study to compare the compliance with standards related to perfusionists in Iran, according to the American society of extracorporeal technology standards.

3. Methods

This study was a descriptive-comparative study in which the consensus method was used for sampling. This study had ethical approval from the ethics committee of Iran University of Medical Sciences and Health Services. The population under study included all university hospitals and public hospitals with cardiac surgery operating rooms. To perform the study, a list of qualified medical education centers and public hospitals, and contact numbers and names of the officials of these centers were obtained through the Iranian Society of extracorporeal technology. Then a questionnaire was prepared with the recommendations of the society of extracorporeal technology and was sent to 60 university hospitals and public hospitals with cardiac surgery operating rooms by express mail and an envelope was included in each packet for sending back the questionnaires. It should be noted that at the beginning of the questionnaire an informed consent form and explanations about the purpose of the study were included and sent to the participants with the questionnaire. Thus, after completing the informed consent form, the participants completed the questionnaire. The researcher made phone contact and followed up the returning of questionnaires. In case of ambiguity of questions or confusion of the participants regarding the questionnaire, their questions were responded.

The data collection tool in this study was a questionnaire prepared by the American society of extracorporeal technology in 2013. In addition, the reverse translation was done for using the questionnaire in the study. In this regard, standards were initially translated to fluent Persian and then, this translation was translated to English by an English specialist again. The Persian text was corrected

based on the match in English text. The face validity of the instrument was evaluated by 12 professors of Iran's University of Medical Sciences and the necessary changes in the questionnaire were applied based on their opinions. The questionnaire was developed by standard tools, so the reliability of the instruments was unnecessary. This questionnaire contained 15 standards classified into three areas: patient-related standards, perfusionist-related standards and the standards related to perfusion protocol. It should be noted that in the present article, only the standards associated with perfusionists are reported. The section related to perfusionists has three subsections: competence, qualification and support staff (seven items), perfusionists' interaction with the medical team (four items) and working hours (two items).

The researcher made contact with the centers that had not completed all items of the questionnaires and completed the unfinished forms. Thus, all items in the returned questionnaires were completed and there was no unanswered question. Information collected after return of the questionnaires, from 48 university and public hospitals with cardiac surgery operating room, was entered to the SPSS software version 22 and the results were analyzed relatively by descriptive statistics and the centers were classified in relation to their compliance with the standards. Meeting the standards at a level of up to 70% or higher was the optimal condition, meeting the standards between 50 and 70% was relatively optimal and meeting the standards below 50% was not optimal.

3.1. Ethical Issues

The ethics committee approval was received for this study from the ethics committee of Iran University of Medical science (2015/07).

4. Results

In this study, 80% of questionnaires were returned after completion. [Table 1](#) shows the frequency and percentage of "compliance with the standard" and [Table 2](#) shows the relative and absolute frequency of the perfusionists participating in the study.

5. Discussion

In relation to the standard of competence, qualification and support staff (questions 1 and 5), the condition was optimal, the condition of question 4 was relatively optimal and questions 2, 3, 6 and 7 reported unfavorable situations. Perfusionists in Iran are first trained at the centers approved by the Iranian society of extracorporeal technology for 18 months and then enter the system; however,

Table 1. Frequency and Percentage of “Standard Observation”

Standard	Evaluation Criterion	Yes, No. (%)	No, No. (%)
Competence, qualification and support staff	1- Do your health center perfusionists have an activity qualification certificate from competent organizations?	42 (87.5)	6 (12.5)
	2- Is your center's perfusionists' activity competence assessed annually?	6 (12.5)	42 (87.5)
	3- Do your center's perfusionists participate in continuing education programs related to perfusion activities?	21 (43.5)	27 (56.3)
	4- Are there enough perfusionists to support perfusionists in emergencies and unforeseen events?	29 (60.4)	19 (39.6)
	5- Do your center's perfusionists have a 2-year academic or 18 months institutional degree in perfusion?	39 (81.3)	9 (18.7)
	6- Are there standards to ensure that perfusionists are aware of their duties and responsibilities?	7 (14.6)	41 (85.4)
	7- Has your health center developed standards for education and training perfusionists?	9 (18.8)	39 (81.2)
	The average percentage	21.58 (45.52)	26.15 (54.48)
Perfusionists' interaction with the medical team	1- Does your health center present a specific cardiopulmonary bypass program for each patient with the participation of surgical team before surgery?	15 (31.3)	33 (68.7)
	2- Does your care center have specific instructions to use mobile phone in the operating room?	10 (20.8)	38 (79.2)
	3- Do you have tips for interaction between the surgical team including verbal orders, ensuring orders and solving ambiguities?	8 (16.27)	40 (83.3)
	4- Does the perfusionist present a report to the team members?	11 (22.9)	37 (77.1)
	The average percentage	11 (23)	37 (77)
Working hours	1- In order to provide appropriate services do the perfusionists have enough rest time between their work programs?	17 (35.4)	31 (64.6)
	2- Do the perfusionists have at least 8 hours rest for a work shift of 16 hours?	10 (20.8)	38 (79.2)
	The average percentage	18.5 (38)	34.5 (72)

their competence is not assessed annually, the reason of which seems to be the lack of value considered for this vital issue. Since the perfusionists in Iran are a subset of nursing system of Iran, they participate in continuous programs, which are common with nursing education programs. Due to the existence of a codified standard in the field of support perfusionists' attendance in heart surgeries, most of the centers comply with the standard under question.

There are a few centers in Iran that train perfusionists, which is why only 18.8% of the centers provided positive response to this question. Although the concept of competence is related to all fields of health care, there is no common understanding of competence among them. Finally, measuring competence is a necessity and it should move from general competence to specialized competence (9). Competence is defined as knowledge, skills, abilities and behaviors that a person has in order to perform duties properly and skillfully. Competence assessment includes factors more than a test or a checklist. Hospitals need to assess, maintain, represent and improve competence in their

employees (10). According to the American society of extracorporeal technology standards, perfusionists' competence should be assessed annually and they should participate in continuous training programs related to perfusion activities (11).

Evaluation of clinical competence is a legal requirement and reflects performance (12, 13). With regards to the need to provide quality care to patients in complex medical environments along with the emergence of new diseases, this concept has become a fundamental issue of centers and researchers believe that in order to maintain hygienic standards, knowledge on development and promotion methods of clinical competence is essential (14). Evaluation of clinical competence considers different areas including clinical environment characteristics, individual characteristics of students and the demands of time and place. Accordingly, this type of evaluation is considered a very difficult process and remains a challenge in the clinical education process. Therefore, many of the organizations in charge of clinical training experience multiple difficulties in developing effective strategies for clinical

Table 2. Absolute and Relative Frequency of Perfusionists' Profile

Perfusionists' Profile Participating in the Study	Frequency (%)
Work experience	
Less than 2 years	2 (4)
2 - 5 years	4 (8)
6 - 10 years	10 (21)
11 - 15 years	10 (21)
More than 15 years	22 (46)
Total	48 (100)
Perfusionists to patient ratio	
1 to 1	3 (6.25)
1 to 1.5	3 (6.25)
1 to 2	41 (85.5)
1 to 2.5	1 (2)
Total	48 (100)
Perfusionists' activity certificate	
Yes	48 (100)
No	0 (0)
Total	48 (100)
The medical rank of Perfusionist who is filling the questionnaire	
Senior Perfusionist	18 (37.5)
Perfusionist	30 (62.5)
Total	48 (100)
A graduate of the perfusion training program	
Yes	38 (80)
No	10 (20)
Total	48 (100)

evaluation (15, 16). Thus, it is emphasized that the methods and clinical evaluation models should be correct and complete and in addition to considering all evidences of clinical competence, with regards to the dependent nature of clinical practice, all context-related factors influencing the clinical behavior of the learners must be included (17).

Regarding the perfusionists' interaction with the medical team, this standard had an undesirable situation regarding all its four sub-categories. The relationship between healthcare professionals is based on research, policy and practice to improve patient safety (18). Based on the American society of extracorporeal technology standards, before the surgery a specific cardiopulmonary bypass program should be determined for each patient with the participation of the surgical team and there should be verbal orders to solve ambiguities, and the responsible perfusion-

ists should provide reports to the surgical team after the surgery (10). The use of mobile phone is another factor related to the perfusionists' interaction in the operating room that should follow specific rules (11).

The relationship between the medical team includes interaction among them to achieve a common goal, which is improving patients' health status. Creating a correct relationship is the most important feature for those working in primary health care services (19, 20).

In relation to the working hours standard, the studied centers had unfavorable conditions in relation to questions 1 and 2, while there was a direct correlation between increase in working hours and adverse effects on patients (21). Regarding the existing condition of working hours, it seems that the lack of manpower in the field of perfusion and low income in return for the work, makes people eager and willing to work in the private sector.

5.1. Conclusion

According to the results of this study, it can be concluded that in Iran the perfusion sector in the field of compliance with standards of perfusionists is in an undesirable condition and this indicates the necessity of the authorities' attention towards accreditation and development of standards of care on the one hand and continuous evaluation of these standards on the other hand. Therefore, studies of this kind can help the authorities and those involved in the health system to provide optimal care services and urges the need for ongoing evaluation of the quality of these services.

5.2. Limitations

Due to self-responsiveness of people to the likelihood of random accountability to questionnaire and concealing the reality, only centers participated in this study, which had interest in solving this problem.

Acknowledgments

This study was part of a master thesis, which was granted by Iran University of Medical Sciences. The authors would like to thank the cardiac surgery team of Shahid Rajaie, cardiovascular, medical and research center, Iranian society of extracorporeal circulation technology and the perfusionists, who participated in this study.

Footnote

Authors' Contribution: Nooredin Mohammadi, conducted the study; Amir Faravan, contributed to statistical analysis, writing the paper and journal submission; Alireza

Alizadeh-Ghavidel and Ziae Totonchi, interpretation of the data and critical revision of the manuscript; Mohammad Zirak: critical revision of the manuscript for important intellectual content.

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