ORIGINAL RESEARCH

Study of the quality of teaching environment and learning of cardiology residents of Shahid Beheshti University of Medical Sciences based on DREEM questionnaire

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Abstract

Background: Educational environments are an integral part of the development of educational programs. Therefore, to improve the quality of clinical education environment, its status should always be evaluated. The purpose of this study was to assess the quality of teaching environment and learning the aids of cardiology residents of Shahid Beheshti University of Medical Sciences.

Materials and Methods: The study was a descriptive study, which evaluates the quality of the learning environment - the teaching of cardiology residents in a full-scale way. 33 people were included in the study. The questionnaire consisted of two sections of demographic information and 50 questions in five areas of learning, professors, student perception of their academic ability, educational atmosphere, student perception of their social conditions. Face validity was determined by medical education specialists and its reliability was 0.83 in Cronbach's alpha. Data was entered into SPSS-25 software and analyzed by descriptive methods and Independent t-test.

Result: The average scores earned in five areas were 4.99 out of a total of 200 points, which was relatively favorable with a tendency towards positive. In comparison with the educational groups, there was a significant difference in the attitude toward the teacher ($p < 0.01$) and the individual's attitude toward their academic ability ($p < 0.01$) between the second and third year residents. This was relatively favorable with a tendency towards positive. In comparison with the educational groups, there was a significant difference in the attitude toward the teacher ($p < 0.01$) and the individual's attitude toward their academic ability ($p < 0.01$) between the second and third year residents.

Conclusion: Although the quality of teaching and learning environment of the cardiology residents of Shahid Beheshti University of Medical Sciences tends to be positive and relatively favorable, but there is room for change. Therefore, the attention of the professors to create an appropriate educational environment should be emphasized on qualitative criteria in assessing the professional capabilities of the students.

Keywords: Quality; Teaching and learning environment; Assessment; DREEM

Introduction

The governing environment for education is a determining factor in creating learning motivation because it reinforces behaviors that lead to better learning and academic achievement (1). Learning environments are composed of elements that are mutually meaningful together. The characteristics and quality of each of these elements are effective in the formation of different behaviors (2). Appropriate and desirable learning outcomes and achievements are positively associated with the desired aspects of the psychological and social learning environments, that is the best environment will produce the best results (3). Learning environment in medical education is one of the most important determinants of the success of an effective curriculum (4). Understanding people from the learning environment has a significant effect on the learning outcomes of the learning environment. (5) The interest in examining attitudes towards the educational environment in medical colleges has been increasing in recent years (6) and in other studies, the importance of measuring learning as an important indicator of learning in educational settings has been emphasized and the need to quantify it (7). Assessment of academic and clinical educational environments is the key to achieving student-centered high quality curriculum (8). If we can identify the operational components in the educational environment and evaluate the attitudes of students and professors towards it, then there is a base for reforming them to facilitate the learning experience in relation to our educational goals (9). Innovation in the medical curriculum and increasing the diversity of student populations in medical courses will increase the sense of need for assessing the educational environment of medical colleges (10). Today, in the clinical educational environment, many variables affect clinical education (11), which include the quality of the curriculum, the way of teaching, the attention to learning and the students who graduate as an operative from the university. Meanwhile, the effect of the educational program can be provided through the quality of the educational environment (7). The World Federation of Medical Education (WFME) has considered the learning environment as one of the goals of the evaluation of medical education programs (12). There is growing recognition of the importance of the environment governing the environment or educational environment on student learning (13). In surveys, measurement of educational environment and learning atmosphere in higher education institutions has been carried out and several cases are available for assessing the environment (14). In this regard, a different methodology is used to measure the educational environment (13). One of the patterns used to evaluate the educational environment is the DREEM model presented by Dr. Susan Ruff at the University of Dundee in Scotland for the diagnosing learning problems and the effectiveness of the change in education, as well as identifying the differences between the real environment and the desired environment (1). Studies have shown that quantitative and qualitative measurement of medical education environments is important not only in describing and evaluating medical faculties, identifying the strengths and weaknesses of educational programs, identifying behaviors, and gaining access to the views of students, faculty and staff, which is a significant indicator in predicting educational outcomes (10). The results of studies have shown the relationship between learning environment, students' attitudes and learning outcomes. Since, there are differences in medical education environments, the use of appropriate tools in a particular environment is necessary because the use of inappropriate tools leads to ambiguity and the confusion in the application of the instrument of thought and mistake in the interpretation of the results (15). The study of Soltani in 2007 is the study of the educational environment of the main clinical units of teaching hospitals of Iran University of Medical Sciences from students' point of view, which emphasized the need for more teachers to adhere to the principles of design and create an appropriate educational environment for better student learning (7). A part of this study which examined the quality of learning environment of dental school of Rafsanjan University of Medical Sciences from students' point of view showed that the attention of professors and authorities to the principles of educational planning and deficiencies to improve the learning environment is essential (16). Considering the

high prevalence of cardiovascular diseases and their high importance in the incidence of chronic mortality and morbidity and the capabilities of individuals in different societies, many cardiovascular diseases in our country have taken place in many countries of the world in the last three decades and has led to significant changes in the methods and tools needed to diagnose and treat cardiovascular diseases.

Considering the fact that Shahid Beheshti University of Medical Sciences is one of the top universities in the country and the Department of Cardiology of this university as a center for the training of specialized cardiologists, is expected to have a high standard in terms of clinical education and its conditions. However, the results of the last ranking indicate that the situation is not expected. Therefore, it is imperative that authorities, while aware of the success rate of the program, are informed of the views of the educational advisers (interested, concerned), and if any problems are detected, by choosing appropriate and timely solutions in motion in order to qualify for the activities, products, services and etc.

It is clear that the evaluation results can lead to changes and modifications in the curriculum. Therefore, the present study aimed to "assess the quality of the clinical learning environment of the cardiologists' specialized residents of Shahid Beheshti University of Medical Sciences from the viewpoint of the specialist residents.

Materials and Methods
This descriptive study was performed on 33 cardiology residents of Shahid Beheshti University of Medical Sciences. A questionnaire consisting of two sections of demographic information includes gender, grade, marital status and 50 questions were graded, five options in five areas of learning, which includes professors, student perception of their scientific ability, educational atmosphere, student perception of social conditions. The specialist was fully volunteering and assured all residents that the confidentiality would be respected. The scores of the questionnaire were based on five options (five Likert options), a ranking list for a total of 200 questions. The options for the

rating system include the totally agreeable (4 points), I agree (3 points), I have no idea (2 points), I disagree (one point) and I totally disagree (zero points). Moreover, 9 items (questions 4.8.9, 17.25, 35.39, 48, and 50) were negative in the form of negative statements that were reciprocally scored. In each domain, according to the number of questions and maximum scores for the related options, the maximum of each domain was calculated based on the DREEM questionnaire. In the domain of learning (12 questions with 48 points), in the field of professors (11 questions with 44 points), students perceptions of their academic abilities (8 questions with 32) and students' social perceptions (7 questions with 28 points) and atmosphere and educational environment (12 questions with 48 points). The overall score for the questionnaire was considered in four groups: in the unfavorable group (0 to 50), the semi-desirable (51 to 100), desirable (101 to 150) and highly desirable (151 to 200) were considered.

Medical specialists evaluated the factual validity of the questionnaire and corrections were made to the translation and its reliability was 0.89 in the Cronbach's alpha. The case study was conducted by the cardiology residents of the second, third, and fourth year of this field. Out of 34 questionnaires, 1 questionnaire was deleted due to lack of accountability and 33 questionnaires were analyzed. The obtained data were entered into the SPSS-25 software using demographic characteristics (mean, standard deviation and frequency), as well as independent T (to determine the desirability of each dimension of the educational environment separately), and post-hoc (Tukey Test) was analyzed.

Results
Out of the 34 distributed questionnaires among the second, third and fourth year cardiology residents, 33 responses were received. The mean age of the students participating in the study was between 20 and 30 years (60.6%) years. 69.7% of the participants were female and 30.3% were male. The average of the total points obtained from the five areas of the educational environment was 99.4 ± 2.15 out of a total of 200 points.

Average	Academic year
24.9 ± 94.2	2nd Year
14.4 ± 110	3rd Year
20.5 ± 93.8	4th Year

Table 1: Average and standard deviation of the score of the questionnaire based on the resident academic year

Average	4th Year	3rd Year	2nd Year	Area
21.48 ± 6.5	21.3 ± 5.7	24.7 ± 6.3	18.8 ± 6.5	Comprehensive learning
23.4 ± 6.2	20.3 ± 5.6	28.0 ± 5.0	21.6 ± 5.7	Field of professors
17.9 ± 4.1	18.4 ± 2.4	20.2 ± 4.7	15.6 ± 3.3	Understand the student of his ability
25.4 ± 10.3	24.5 ± 11.8	24.6 ± 3.3	26.8 ± 13.3	Atmosphere and learning environment
11.0 ± 3.4	9.2 ± 3.6	12.3 ± 2.7	11.2 ± 3.5	Student social understanding

Table 2: Average scores of different areas of teaching and learning environment based on a course of study with a 95% confidence interval

The maximum score, mean, standard deviation and percentage of score in the five dimensions of teaching and learning environment are presented in Table 3.

Average and standard deviation	Maximum score	The dimensions of the educational environment
21.4 ± 5.6	48	Comprehensive learning
23.4 ± 6.2	44	Field of professors
17.9 ± 4.1	32	Understand the student of his ability
25.4 ± 10.3	48	Atmosphere and learning environment
11.06 ± 3.4	28	Student social understanding
99.4 ± 21.5	200	Educational environment

Table 3: Average scores for five areas of teaching and learning

According to Tukey's test, there was a significant difference between the two educational groups of cardiology residents in the second and third year of study in the field of attitude toward the teacher. Also, in comparison with the residents of the third and fourth years of study, there was a significant difference in both comparisons the difference was higher in the third year group than in the second and fourth year residents ($p < 0.05$). There was a significant difference between the attitude of the individual and the second and the third year in terms of their academic ability.

In examining the difference between the general average of teachers ($p < 0.01$) and student's knowledge of their academic ability ($p < 0.01$), in terms of educational level, using the T-test, the mean of the total score in the third year group of residents was higher than the other groups) (Figure 1).

p< 0/05	Study course	Variable
0/02 0/01	2-3 4-3	Master's field
0/01	2-3	The domain of a comprehensive understanding of their scientific abilities

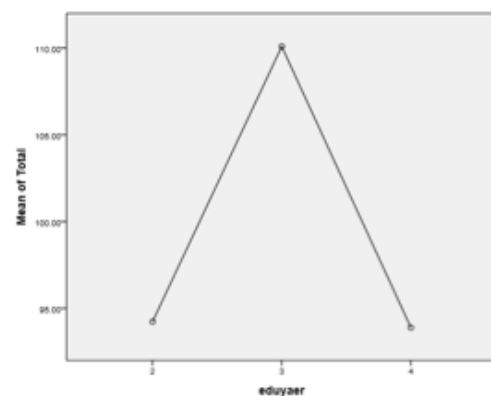Table 4: Comparison between different educational groups (Tukey test)

Figure 1: Average total score in the third year group of residents compared to the second and fourth year residents

In examining the whole group score, it showed that out of a total of 33 participants, one had an unfavorable learning environment (3%), 16 fairly problematic participants (48.5%), and 16

other participants, positive cases compared to negative ones more reported (48.5%).

Discussion

According to the aim of the study, which was to assess the quality of the environment and learning of cardiology residents of Shahid Beheshti University of Medical Sciences from the viewpoint of the residents, the results showed that in general five domains in the cardiology sector, according to the scores obtained based on the level of residency. There is a relatively favorable trend in education, which shows a positive tendency, with positive aspects more than negative aspects, which was shown by the study of Ahari in 2017, which was based on the manual of Machalier and Rough, and showed that the educational environment and the opinion of the resident is more positive than the negative ones, and is consistent (17). However, in terms of the educational environment, such as the assessment of the emergency department, and learners in this area are in critical condition, they had a slightly different educational environment for the cardiology residents. Although in the present study, according to the score of 99.4, there is a set of problems in the educational environment, but attention to the boundary of this score can be outlined that the planners and decision makers of this system are in the right direction and must have a structure for traditional and modern universities. Based on the DREEM model, the learning environment of the cardiology residents showed that there was a significant difference between the views of the third year vs the second and fourth year residents, which seems to be due to more attention of the third year residents due to reducing work desks, and subsequently reducing stress, giving them freedom to act in decision making and educating their peers. The results of this study, published in 2004, showed that high stress and stress in clinical settings are the main factors affecting the learning and learning environment (18).

Teaching and learning conditions in all cardiology care courses need to be reformed in order to improve the acceptable educational environment by reducing stress for students and graduates who are more qualified in providing health services to target individuals and society, so that force development personnel will fit to the needs of society and will be satisfactory. The low mean score of the scope of comprehensible comprehension of their academic abilities in this study can be in line with the results of Sajadi's research in 2014, which recognizes learning weakness as one of the factors of learning failure and an obstacle to learning transfer, and creative, specialist and highly motivated person is a prerequisite for the organization's leadership and success (19).

In the same study, in a study by the University of California in 2017 on clinical professors, the results showed that high quality education features include: sustainable learning outcomes, good learning environment, use of teacher training sessions, and high quality education facilitating factors. Assigning time, providing feedback and learning experiences for the learner: Participation in educational sessions, awareness of educational programs, among other things, in improving the quality of education (20).

The results of this study showed that in spite of the relatively favorable situation in the educational environment, in some areas such as the faculty, with a brief change, a better learning can be provided.

In 2001, Resinberg showed in his study that one of the most important factors in creating a quality education environment in educational hospitals is the characteristics of the teacher, which includes interest in the subject of the course and the student, as well as the ability to engage the student in learning experiences (21).

The results of Robbie Robert's study in 2017, examining the viewpoints of medical students from clinical settings, showed that the feeling of belonging to the department and team work, student-based supervision, which is the prerequisite for effective learning and patient care, the expected tasks of the student and his interactions, the time and place set for training, the significant impact of teacher and teacher behavior on the learner, and the understanding of the clinical learning environment, like how the student is learning and organizing learning opportunities, the sense of attention and sense of team participation, and the design of the learner's tasks and its evaluation is one of the most important factors for promoting the

learning environment. This is consistent with the study on learner attention, how to learn and how to organize learning opportunities, and the impact of teacher and teacher behavior on the learner (22).

Also, Cisco knows how to initiate a teacher's first contact with the student in an educational environment, including the influential factors in the quality of the teaching and learning environment that he or she should pay attention (23). Chan explains in his study of the validation of the learning environment teaching methods and assessment of students, identifying the sources of stress, and strategies for preventing and correcting student injuries prepare students to acquire the necessary skills (24). Therefore, considering that the center of gravity in any student education program is being studied, it should play an active role in the process of decision making in the field of education and its strengths and weaknesses, educational planning, teaching and learning conditions to motivate them.

Paying attention to quality indicators in education can make learning better. In addition to the internal motivation, it should be noted that factors such as the environment of education and the teacher and finally the social environment could also improve the quality of learning. The results of this study showed that due to the relatively favorable situation in the educational environment, the field of change it is necessary from the field to provide better learning.

Establishing friendly meetings between faculty and students outside the official hours of education, taking into account the learning style of students in educational programs, creating an ideal educational environment in which learners feel safe and secure clinical experiences, emphasize qualitative criteria in the evaluation. Professional empowerment of students in addition to quantitative criteria and reduction of documentary degree and scoring, reduction of educational contradictions and emphasis on educational, research and services based on scientific evidence and paying attention to supportive methods of students and familiarizing them with study methods are issues that promote quality of teaching and learning environment. The main limitation of this study is the small statistical society of Shahid Beheshti University of Medical Sciences and limited admission in this field and the lack of cooperation of the residents in completing the questionnaire.

Conflict of interest
Authors declare no conflict of interest.

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