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Original Article

Investigation of the importance and achievability of early clinical exposure goals (ECE) from the viewpoints of basic sciences medical students of Mashhad Islamic Azad University and its comparison with their academic performance

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Abstract

Background: Early clinical exposure (ECE) could enhance students' learning in the emotional and cognitive domains, socialization with the profession, and the development of professional personality and professionalism. It can also provide a suitable opportunity for future career recognition by creating a more appropriate image of the medical profession. Therefore, the present paper aims to investigate the importance and achievability of ECE goals from the viewpoints of basic sciences medical students and their comparison with their academic performance.

Methods: In this descriptive cross-sectional study, 100 medical students were admitted to the hospital after 34 hours of workshop training on professional principles during the first two semesters in 2023-2024. They experienced and practiced their lessons learned in the clinical context. The data collection instrument of the study was the ECE Questionnaire. Its face and content validity were confirmed, and reliability was calculated to be 0.926 through Cronbach's alpha.

Results: In 93 studied students with a mean age of 21.34±1.363, the mean score of the importance scale of objectives was 99.31±8.59, and the achievability scale was 81.62±13.75, which indicates that despite the high importance of the objectives of the program for students, achieving those objectives is not easy. Also, the educational importance of the objectives of the course and the achievability of the objectives had a significant statistical relationship with the academic performance of students and had no significant statistical relationship with gender and age.

Conclusion: The students held the importance and achievability of the objectives of the ECE program in high regard. More successful students take the importance and achievability of the objectives of the ECE as significantly more important. Despite the high importance of the objectives set out, achieving these objectives is not easy, and this part of the program requires more educational planning and design.

Introduction

Organization of the content of medical education and implementation of vertical integration and spiral curriculum strategies in undergraduate medical education is an important topic in formulating the related curriculum around the world.[1,2] Medical education courses incorporate various stresses, including dealing with unfamiliar educational contexts such as clinical education environments. Early clinical exposure (ECE) has been suggested as one of the strategies to reduce professional stress, orient students' professional attitudes, and create motivation.[3] It is considered an important part of educational courses in the developed countries.[4] Familiarity of the medical students with the ECE in the very early years, i.e., before the clinical course formally begins, was practiced about a century ago in the medical schools around the world[5]. The common approach to medical education over the last century has

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been theoretical education in medical schools for 2 to 3 years before the start of the clinical course. This medical education approach has been about to be changed over the last century. Therefore, many medical schools around the world are implementing vertical integration programs, and nowadays, ECE with the patient.[6-8] In a study by the European Academy of Teachers in General Practice (EURACT) in 2006, from among 32 member states, 40 medical schools from 16 countries were studied. Thirty-two (80%) medical schools implemented the ECE program during the first year, with the duration of the course varying between two weeks to two years and the duration of each session between 2 hours to the whole day.[9] It is generally believed that this method could enhance students' learning in the emotional and cognitive domains, socialization with the profession, and the development of professional personality and professionalism.[6,10] ECE also enhances understanding of health and primary care, self-directed learning, empathy with patients, motivation for better learning of the basic science, increases satisfaction, provides a correct attitude towards future profession, provides the possibility of observing physician-patient relationship, familiarity with hospital environment, and learning some simple clinical skills.[11-13] In other words, the ECE approach is one of the suggested strategies for solving the challenge of learning and teaching basic medical sciences students and the intangibility of the general intangibility of the relationship between basic sciences and clinic contexts, and also the distance of basic sciences students from moving on the path of becoming a physician. Lack of proper communication and experience in transitioning to the clinical environment could lead to a wide range of positive and negative emotions. Not only may it disrupt the formation of the fundamental concepts in basic sciences and also the practical understanding of courses, but also, it may also affect the motivations and abilities of the student negatively.[14] Given the negative attitudes toward medicine that are formed in the very first years, and the numerous reports that mentioned the positive effects of a familiarity with, and early exposure to the clinical environment, one can conclude that these courses can positively influence the students' needs, motivations, and attitudes, and consequently their academic performance in the future. This could even provide students with a better image of the medical profession as a good opportunity to know about their future occupation, something that is not possible in many other disciplines. While in our country, students are away from the real medical and clinical environment until the fourth year of medical education.[15,16] In the current environment, there is a need for credible evidence on the program, based on which to draw the goals and outputs expected of the program and consequently the educational practices used in its implementation.[17] Although there are already good theoretical foundations for establishing ECE for students, the concrete implications of such programs have not yet been clearly defined.[18] The Early Clinical Exposure Program started in 2017 at Islamic Azad University of Mashhad, and is implemented every semester. Therefore, the present paper aims at investigating the importance and achievability of ECE from the viewpoints of basic medical sciences students and its comparison with their academic performance. Given the above, it seems useful to consider such an intervention in the early years of academic education.

Methods

This is a descriptive cross-sectional study for investigating the importance and achievability of ECE from the viewpoints of basic medical sciences students at Islamic Azad University of Mashhad and its comparison with their academic performance in 2023-2024. The statistical population of this study consisted of medical sciences students in the third semester, with a number of 100 according to the Census Bureau. Due to the limited statistical population, a census sampling method was used. After about 34 hours of workshop training in the first two semesters on the nature of the medical field, principles of professional ethics and behavior, communication with patients, hierarchies, and descriptions of various disciplines, quality improvement mechanisms, and dealing with medical errors and patient safety, the students attended the hospital and practiced what they learned in the clinical environment. Some of the issues highlighted included: implementation of the principles of medical professional dress codes, familiarity with the physical structure and hospital departments, familiarity with hospital hierarchies and interactions of different groups, initial communication and empathy with patients, observing professional interactions in the environment, and acquaintance with professional realities in areas such as emergency, ICU, and hemodialysis, hand washing, application of basic sciences for the patients and paraclinic and so on.

To study the achievement of the goals and importance of the program from the students' viewpoints, the ECE Questionnaire was used in 8 main areas (medical ethics, scientific skills, primary care, communication skills, patient-centered care, familiarity with clinical education, integration of basic and clinical science, and motivation for learning basic sciences). The minimum score of the questionnaire is 22, and the maximum is 110.[19] This questionnaire was developed by Adibi and Kianinia to assess the ECE courses, so it investigates the students' attitudes toward the importance and achievability of its goals separately in two five-point Likert scales (1 = insignificant to 5 = very significant; and 1 = not achievable at all to 5 = easily achievable). The face validity of the questionnaire was confirmed by three experts, and its reliability was calculated by Cronbach's alpha. This questionnaire was used in 2005 by Adibi and Kianinia; its

face and content validity were confirmed by the experts'.[19] The reliability of the questionnaire was calculated by Cronbach's alpha to be 0.926. Students were reminded that the results of this study were solely to be used for the project goals and would not affect their educational and evaluation process. Questionnaires were collected anonymously after obtaining informed consent from students. The academic performance variable (the grade point average of the previous semester) was investigated for both the importance and the achievability of the goals of the program. Data analysis was performed by SPSS 21 software using Spearman's correlation coefficient and the Mann-Whitney test.

The normal distribution of the data was analyzed using the Kolmogorov-Smirnov test ($P<0.05$), and therefore, the data are not normal. The Mann-Whitney test was used to analyze the data.

Results

93 among the 100 students studied completed and submitted their questionnaire, and the response rate was 93%. Of these, 27 (29%) were males, 66 (71%) were females. 8 (8.6%) were married, and the rest were single. The age range of participants was 20-26, and the mean age was 21.34 ± 1.363. The grade point average of the students ranged from 13 to 19.54 with a mean of 16.43 ± 1.43.

The score range of the students in the importance of the ECE program goals was 73-110, with a mean of 99.31 ± 8.59. Also, the score range of the students in the achievability of the ECE program goals was 44-105, with a mean of 81.62 ± 13.75. Table 1 shows the mean and standard deviation of scores of each questionnaire item in terms of both the importance and the achievability of the ECE program goals.

The results show that the mean score of all items of the importance of the ECE program goals is over 4 on the five-point Likert scale (1 = insignificant to 5 = very significant). However, the mean score of students on the achievability of ECE program goals is below 4 on the five-point Likert scale (1 = not achievable at all to 5 = easily achievable), except in the items 1, 3, 17, and 18. In other words, although students placed a high importance on the goals of the ECE program, they believed that achieving these goals was not easy.

Statistical analysis revealed that there was a significant relationship between the importance of the goals of course goals and the academic performance of the students ($P<0.001$). It is indicated in. It does not have a significant relationship with the gender (Mann-Whitney, $P=0.633$) and age ($P=0.376$), and marriage status ($P=0.054$) of the students.

Furthermore, the statistical data showed a significant

Table 1. Mean of the scores of students in terms of the importance and the achievability of the ECE program goals

Importance of goals			ECE goals	Achievability of goals	
Row	SD	Mean		Mean	SD
1	1.00	4.41	Learning simple clinical preparations, such as the dress code of medicine, and hand washing	4.44	0.73
2	1.06	3.60	Communication with the patient and assessment of the impact of the disease on his individual and social lives	4.63	0.51
3	1.13	4.15	Getting acquainted with the hospital environment and its different departments	4.37	0.95
4	1.20	3.60	Increasing students' motivation to study medicine	4.67	0.52
5	1.08	3.72	Creating the right attitude towards the medical profession	4.71	0.48
6	1.01	3.80	Taking responsibility for the patient's life and personality	4.86	0.35
7	1.00	3.72	Learning to take the patient as a human, not a case or a disease	4.75	0.46
8	0.86	3.69	Understanding the importance of the right physician-patient relationship	4.54	0.62
9	1.19	3.71	Understanding that medicine, while a science, is an art and a profession	4.52	0.73
10	1.30	3.46	Observing the realities of the medical profession tangibly	4.55	0.68
11	1.22	3.30	Becoming familiar with the concept of self-centered learning and problem-solving in medicine	4.60	0.53
12	1.03	3.28	Having the ability to Communicate effectively with the patient	4.55	0.56
13	1.13	3.67	Understanding the importance of the role of other healthcare professionals	4.30	0.60
14	0.97	3.71	Understanding the physician's responsibility toward community health	4.48	0.60
15	1.14	3.60	Understanding the importance of teamwork in the medical profession	4.61	0.63
16	1.30	3.28	Getting the ability to communicate between what they learned in basic sciences and clinical practice	4.32	0.93
17	1.25	4.01	Understanding the different stages of clinical education	4.43	0.94
18	.88	4.13	Learning about the different rankings of medical education staff	4.40	.78
19	1.27	3.51	Becoming familiar with the applications of common paraclinics	4.38	.78
20	.99	3.44	Communicating with senior students and physicians	4.04	1.00
21	1.12	3.97	Learning about the mechanisms for quality improvement and dealing with medical errors in the hospital	4.78	0.46
22	.96	3.87	Observing the path a patient takes in an educational hospital	4.38	.69

relationship between the achievability of the goals and the academic performance ($P=0.004$) and marital status (Mann-Whitney, $P=0.034$). However, no significant relationship was found with gender (Mann-Whitney, $P=0.429$) or age ($P=0.974$) of the students.

Discussion

93 medical students of Islamic Azad University of Mashhad participated in this study. Of the 93 students studied, 85 (91.4%) were single, and 8 (8.6%) were married, and the mean age was 21.34 ± 1.363. This study endeavored to investigate the importance and achievability of the goals of the ECE program from the viewpoints of basic medical sciences students. Comparison of the mean scores at the two scales showed that students underestimated the achievability of program goals than their importance. But despite the high scores on both scales, this result clearly demonstrates that students are aware of the importance of this training program and its goals, and are aware of the achievability of the goals. They know that these goals cannot be easily achieved. In line with the present study, in another study entitled "What goals should be sought in ECE courses?", Adibi and Kianinia concluded that the median score of the importance of all items of the importance of ECE program was equal to or greater than 4. The mean score of the achievability of the goals of this program was 3 in 8 items, and it was 4 in the other goals. Overall, the students agreed with the importance and achievability of the selected goals[19]. In a 2017 study by Govindarajan et al in India on the impact of the ECE program on basic medical sciences students, it was found that the program had a significant impact on cognitive, mental, and motor domains. The qualitative analysis of students' views provided the themes of "applications of the basic sciences in clinical practice", "learning motivation", "acquaintance with different specialties", and "insight into what is happening to patients".[20] On the implementation of ECE in Thailand, the students took this course as a presentation of the value of professional and clinical medical roles and reported this experience as encouraging and motivational[21]. Achieving the goal of integrating the basic sciences and clinical sciences in the ECE program was successful in most studies.[9,22] Numerous other studies, conducted at Shiraz University of Medical Sciences and Sabzevar University of Medical Sciences, also suggested that ECE is good or excellent in increasing motivation, increasing interest in learning basic sciences, and increasing sensitivity to patients' problems and needs.[23] The results of Kojury et al, who aimed to evaluate the success rate of the ECE program for first-year medical students in Shiraz, showed that this program was effective in creating a new attitude in 80% of learners.[3] Karimi et al also showed that 95.5% of students rated the ECE course as useful. 83.3% also believed that ECE led them to enjoy studying medicine in the future.[24] In line with this study, another study found that the students' satisfaction with the ECE program was 82%, time of program implementation 66%, necessity of continuation of program 54% and impact of program on their cognition and attitude 77%. In most studies on ECE, satisfaction with courses and enhancement of students' positive attitudes were reported.[19,23,25,26] Other important results of this study were to investigate the relationship between the importance and achievability of the goals of the ECE program and their academic performance. The results showed that there is a significant correlation between the achievability and importance of the goals of the ECE program and their academic performance. In their study entitled "Investigation of the effects of ECE program on changes in attitudes of basic medical sciences students considering the methods of preparation for entering clinical course in Internal Medicine, Surgery and Pediatrics during 2013-2014, Seifrabei et al examined the effect of ECE program on students' end-of-semester grades. At the beginning of this study, the frequency of those who agreed with the effects of ECE before the start of the program was 5 students, and after the program, it was 13 students. Subsequently, comparing the academic scores of the students, it was concluded that although the students' scores were higher after the program, there was no significant difference between the mean scores of the students before (1.92) and after the (2.07) the ECE program ($P=0.74$).[27] Investigating the relationship between demographic variables and the importance and achievability of the goals of the ECE program showed that gender and age are not important factors in students' views of importance and achievability of the goals of the ECE program; however, marital status is related to their views of the achievability of the goals. In terms of gender difference, however, in the study of Adibi and Kianinia, there was a more positive attitude toward the ECE program in women than men, which is inconsistent with the present study.[19] In the present study, there was no significant difference between men and women in terms of their attitude toward the ECE program. Considering that this study was performed on a small scale, it is recommended to conduct more extensive qualitative studies in order to investigate the factors affecting students' attitudes toward the importance and achievability of the ECE course.

Conclusion

Students reported high importance and achievability of the goals of the ECE program. The results show that more successful students consider the importance and achievability of these goals significantly higher than other students. However, the high importance of these goals does not generally make their achievement easier. Therefore, this aspect of the program requires more

educational planning and design.

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Authors' Contribution

Conceptualization: Leila Bazrafkan, Arezou Farajpour, Samaneh Sarvghad Moghadam.
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Competing Interests

The authors declare no conflict of interest.

Ethical Approval

The study was approved by the ethical committee of Shiraz University of Medical Sciences. (IR.SUMS.REC.1398.797).

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