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A Survey of Critical Thinking Skills of Faculty Members of Ahvaz Jundishapur University of Medical Sciences, 2020

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One of the important tasks of faculty, in addition to transferring knowledge and skills to learners, is to train students as thoughtful, analytical and critical thinking individuals. The need for critical thinking in medical education in response to the rapidly changing health care environment has been emphasized. One of the main tasks of any medical educational institution, in addition to developing students' professional competencies, is to develop decision-making, problem-solving and self-efficacy skills, which are themselves influenced by the ability to practice critical thinking. The aim of this study was to investigate the critical thinking of the faculty members of the medical school of Ahvaz Jundishapur University of Medical Sciences in 2020. This is a descriptive-analytical study. The sample consisted of 53 faculty members of the medical school of the University of Medical Sciences. The data collection tool was the California Critical Thinking Questionnaire Form B. Independent t-test and Pearson correlation were used to analyze the data .The mean score of faculties' critical thinking skills was 12.53, which is lower than the average score in the standardization process (15.89). Other findings showed that there is no statistically significant difference between critical thinking and gender, age and academic rank of professors. The results of the study indicate the weakness of faculties' critical thinking in critical thinking and all its dimensions, which indicates the need to teach critical thinking skills at the university level.

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Introduction

Efforts to develop critical thinking skills is one of the most important goals and missions of universities and higher education centers. Because the current situation in a world full of change in the 21st century requires that university graduates be thoughtful and educated people who can meet the needs and requirements of living in such a world by using their critical and creative abilities. This goal is doubly necessary for all academic disciplines, especially in the field of medical sciences, whose main subject is the study, evaluation and decision-making on the patient's bedside (van der Zanden et al., 2020, Jafari et al., 2020, Susetyarini and Fauzi, 2020). For this reason, the World Federation Medical Education, while considering critical thinking as one of the standards of medical education, emphasizes on its growth and strengthening in the curriculum and education of students in medical schools and introduced it as one of the key points in the accreditation of medical schools (WFfM, 2003).

One of the important tasks of faculties, in addition to transferring knowledge and skills to learners, is to train students as thoughtful, analytical and critical thinking individuals. However, research findings indicate that the ability and performance of students in various universities in the country in the field of critical thinking is low. Researchers in their studies, while confirming the low level of critical thinking skills in students, have stated that in this regard, there is no significant difference between students of different universities and critical thinking skills are low among all students in the country (Sheikhmoonesi et al., 2013, Shakurnia and Aslami, 2017, Javidi and Abdoli, 2011, Hosseini et al., 2021). Researchers have considered the main factors in this situation to be the lack of a favorable level of critical thinking by faculties and their use of traditional and passive teaching methods and inappropriate evaluation methods; and have emphasized to review of the role and position of faculties in the field of teaching critical thinking(Kasalaei et al., 2020, Amini and Madani, 2018).

According to researchers, current teaching methods in universities are not responsible for the development of critical thinking in students(Maleki and Rezaee, 2016, Aslami et al., 2021) .Certainly, the role and position of faculties as environmental providers is very important for cultivating this thinking. In order to be able to teach critical thinking to students, we must see what is the understanding and ability of faculty members of critical thinking? If the perception and ability of professors of this thinking is high and acceptable, if appropriate methods are used, we can expect to nurture students with critical thinking. Naturally, faculties are more successful in educating students and developing critical thinking who have a high level of critical thinking. It is necessary for professors to have critical thinking skills, because professors with low levels of critical thinking cannot develop critical thinking in students. However, the results of few studies that have been done in this field indicate that the level of critical thinking scores in faculties is low. Yousefi Saeedabadi in 2009 in Mazandaran University of Medical Sciences and Fatehi Kharazmi in 2018 in Isfahan State and Free Universities by examining the level of critical thinking skills of professors have reported the average scores of professors as weak and lower than the international standard(Yousefi et al., 2009, Fatehi Khouzani et al., 2019, Zarea Gavgani et al., 2021).

Since the development and strengthening of students' critical thinking in universities is one of the main goals of higher education. Therefore, its mechanisms must be seriously considered. It should be acknowledged that in developing critical thinking, in addition to educational programs and teaching methods, the performance of teachers and their ability in critical thinking skills is also important. Because, the professors who are supposed to act as teachers in teaching critical thinking to students themselves must have high levels of critical thinking in order to be able to teach it to students in appropriate ways. For this reason, measuring the level of critical thinking skills of university professors as faculty members can help clarify the current situation.

Despite the importance and special attention to critical thinking in higher education centers and its vital role in medical students in relation to human health and also considering that university professors have a pivotal role in developing and strengthening critical thinking skills in students in this field in the country. Not much research has been done, so this study was conducted to compare the level of critical thinking of basic science professors at Ahwaz Jundishapur University of Medical Sciences.

Method

This descriptive cross-sectional study was conducted in 2020. The study population was the faculty members of Ahvaz Jundishapur University of Medical Sciences was 62, according to previous studies(Shakurnia and Aslami, 2017, Yousefi et al., 2009) and based on Cochran's formula in determining the sample size. Sampling method was available

Data collection tool was California Standard Critical Thinking Skills Questionnaire (CCTS) Form B, which was designed and validated by Facione and Facione in 1990. The validity and reliability of the Persian translation of this questionnaire in previous studies in Iran has proven(Hosseini et al., 2021, Khalili and HOSSEIN, 2003) that this questionnaire is currently one of the most common tools for measuring critical thinking skills. The California Critical Thinking Skills Test (Form B) consists of 34 multiple-choice questions, of which 19 are four-choice questions and 15 are five-choice questions with one correct choice. The range of questions includes items that measure semantic analysis from one sentence to a more complex combination of critical thinking skills. The scoring method is that for each question. The correct one grade is given to the person and the sum of the correct questions of the test is the total score. The final score of the test is 34 and the score obtained in each part of the test varies from zero to 16. Evaluation section with a maximum of 14 points, in the inference section with a maximum of 11 points, In the inductive reasoning section is set to a maximum of 14 points and finally to the deductive reasoning section to a maximum of 16 points. Thus, for each person, six scores include 5 scores of critical thinking in each section and a total score of critical thinking. The time required to answer the test questions is 45 minutes.

This questionnaire was designed and validated by fashion and fashion design and its validity and reliability. The reliability of the test using Kuder-Richardson coefficient has been reported from 0.68 to 0.70(Facione and Facione, 1994) In Iran, validity was first translated by Khalili and Soleimani and then it has been reported as 0.62(Khalili and Soleymani,2003)

In order to comply with ethical principles, the questionnaires were completed anonymously by faculties and students, and the confidentiality of participants' information was carefully observed.

The data was analysis with SPSS-18 software and descriptive indices and independent t-test and Pearson correlation. For all tests, the maximum error was considered 0.05.

Results

Out of 62 distributed questionnaires, 53 (85.5%) completely completed the questionnaires. Of these, 29 (54.7%) were male and 24 (45.3%) were female. The mean age of faculties was 46.45 ± 9.8 years with a minimum of 28 years and a maximum of 67 years. 2 faculties (3.8%) with the academic rank of instructor, 31 (58.5%) were assistant professors, 13 (24.5%) were associate professors and 7 (13.2%) were professors).

The mean score of critical thinking skills of the faculties was 12.53± 3.7. This average is lower than the standard (15.98) and shows that the level of critical thinking skills in faculties in this study is low and weak. According to the critical thinking test score (34), the faculties in this study have obtained more than one third (37%) of the total critical thinking test score. The average scores of critical thinking and its subscales in students and faculties are given in Table 1. Comparison of the

mean scores of critical thinking showed that there is no statistically significant difference between the level of critical thinking of male and female faculties (p = 0.98). Comparison of scores of subscales of critical thinking showed that there is no statistically significant difference in all subscales of critical thinking in male and female faculties (p <0.05).

Table No. 1. Comparison of the average scores of critical thinking and its subscales in faculties by gender

variables	total	male	female	t	p
Evaluation	2.12±4.96	2.02±5.00	2.28±4.91	0.023	0.98
Interpretation	1.61±3.67	1.59±3.75	1.66±3.58	0.141	0.88
Analysis	1.51±3.87	1.30±3.76	1.75±4.04	0.390	0.69
Deductive reasoning	2.14±5.34	1.63±5.34	2.68±5.33	0.674	0.50
Inductive reasoning	2.09±5.49	1.99±5.41	2.24±5.58	0.018	0.98
Critical Thinking	3.77±12.52	3.25±12.51	4.39±12.54	0.291	0.77

The average scores of faculties' critical thinking by academic rank in the two groups of assistant professor and lower and associate professor and higher are shown in Table 2. Comparison of the mean scores showed that the level of critical thinking and its subscales in faculties with the rank of associate professor and professor is higher than the other two groups. But this difference between the two groups was not statistically significant (p <0.05).

Table 2. Comparison of the mean scores of critical thinking subscales in students by rank

variables	Assistant professor	Associated professor	t	p
Evaluation	2.07±4.87	2.24±5.10	0.365	0.71
Interpretation	1.54±3.42	1.68±4.10	1.49	0.14
Analysis	1.60±3.75	1.37±4.10	0.795	0.43
Deductive reasoning	2.40±5.36	1.68±5.30	0.104	0.92
Inductive reasoning	1.75±5.09	2.45±6.15	1.82	0.073
Critical Thinking	3.70±12.06	3.85±13.30	1.16	0.25

Examining the relationship between critical thinking scores and age of professors using Pearson correlation test showed that there is no statistically significant relationship between the mean score of critical thinking and age of professors (p = 0.73, r = 0.047).

Discussion

The findings of this study, which was conducted to investigate the level of critical thinking of basic medical faculty members in the medical school, showed that the level of critical thinking skills of medical school faculties with an average of 12.53 ± 3.7 lower than the global average standard of the

test. critical thinking skills (15.89) and are generally low and weak. the total score of the critical thinking skills test, is 34(Eslami et al., 2017), an average of 12.53 in this study, which is less than one-half of the total score, is a reason to claim that obtaining this average is a very poor score for this is an educated class. Dimensional analysis of this variable consisting of evaluation, inference, analysis, deductive and inductive reasoning showed that all dimensions of means are below average. Thus, the participants of the present study had poor critical thinking. The highest mean score of different domains of critical thinking skills in the studied faculties with 5.49 ±2.09 was related to the field of inductive reasoning and the lowest mean with 3.67±1.61 was related to inference.

The results showed that the average level of critical thinking obtained by the faculties participating in this study was lower than the average scores of the faculties of Mazandaran University of Medical Sciences (13.77), but higher than the scores obtained by the the faculties of Agriculture of Isfahan State and Free universities. Those who acquired scored less than a third of the critical thinking skills test score,(Yousefi et al., 2009, Fatehi Khouzani et al., 2019) .Analysis of the dimensions of this variable consisting of evaluation, inference, analysis, deductive reasoning and inductive reasoning showed that in all these dimensions, the average is less than average and weak. Findings show that the average scores of critical thinking of medical faculties of Ahvaz Jundishapur University of Medical Sciences are similar to some universities in the country, but have a lower average than other countries. In similar studies in the United States and Australia on university professionals and educators, the mean scores of critical thinking were reported to be 17.4 and 18.76, respectively(Yousefi et al., 2009) . Which has been higher than all studies conducted in our country. However, the relative low score of critical thinking in Iranian universities may also be due to cultural differences(Maleki et al., 2016) .However, due to poor grades in Iran, it is necessary for officials to pay more attention to educational programs based on improving this skill. Given this dilemma, some researchers in the field of critical thinking development strategies have emphasized the interest, ability and key role of professors as a key factor in strengthening critical thinking in universities (Vodgani, 2015, Hatami et al., 2013). The good scientific and clinical mastery of the instructor in what he / she offers can also be a significant factor. When a teacher has good critical thinking, he or she can teach it to others, so teachers represent a critical thinker.

The results of our study showed that there is no statistically significant difference between the mean score of critical thinking skills and its dimensions in the studied students with gender. But the average of these scores was higher in male faculties. In Yousefi Saeedabadi's study, the mean score of critical thinking in men was slightly higher than women, but the difference between the two groups was not statistically significant(Yousefi et al., 2009) .This finding has been confirmed in most similar studies(Maleki and Rezaee, 2016).

The analytical results of the present study also showed that there is no significant correlation between academic rank and age of faculties in terms of critical thinking and its subscales. In the study of Yousefi Saeedabadi and Fatehi Khozi, there was no significant relationship between the overall score of critical thinking and the age of faculties(Yousefi et al., 2009, Fatehi Khouzani et al., 2019), which are consistent with the findings of this study.

One of the important tasks of university faculties is to train thoughtful, analytical and critical thinking students. But critical thinking skills are not easy to learn without planning. This thinking can be transmitted through curricula and in the current situation, by fundamentally changing the curriculum and changing the attitude and strengthening the skills and abilities of faculties in the field of critical thinking skills, we can develop and strengthen this type of thinking in universities(Aslami et al., 2021).

Therefore, paying attention to the role of faculties in this field is one of the basic principles for the

growth and development of critical thinking; Because faculties, due to direct and effective interaction with students, are the main axis of change and have the ability to motivate and empower students in terms of insight, attitude and critical skills. The findings of this study indicate a lack of sufficient skills among most university professors in the field of critical thinking, which leads to a lack of effective role in cultivating students' critical thinking. In the studies conducted in this field in the country, the level of critical thinking of professors has been evaluated as moderate to weak(Yousefi et al., 2009, Fatehi Khouzani et al., 2019) .

Vodgani(Vodgani, 2015) in a study examining the obstacles and shortcomings of fostering critical thinking in universities, has suggested strategies for fostering critical thinking in universities, including holding continuing education courses for university professors with the aim of understanding about critical thinking and its teaching methods in order to cultivate critical thinking in students, faculty must begin with change in the first place. "They need to know critical thinking and its components well, and acquire the critical thinking skills themselves, and know that by being a 'critical teacher,' they can stimulate, facilitate, and reinforce critical thinking in the classroom."

Among the limitations of this study is that about 15% of the faculties did not complete the questionnaires, this point can be effective in generalizing the results and can be considered as one of the main limitations of the research. The difficulty of the questions of the critical thinking test and the reluctance of the faculties to complete the questionnaire and also its time can be considered as factors involved in this result and participants may be tired and answer casually while answering the questions, especially the final questions. Second, the study was conducted at a university and on faculty members. Therefore, it is recommended to conduct similar studies in the medical faculties of medical schools as well as faculties of other schools and to make comparisons between different of them.

Conclusion

The results of this study showed a low level of critical thinking among faculties. Considering the results of this research and the importance of critical thinking skills in teaching, analysis, inference and evaluation, it is suggested that by holding training courses, critical thinking for faculties and using different teaching methods such as problem-based learning and participatory learning, strengthened and developed the skills of critical thinking in professors and provided the ground for the growth and development of critical thinking in the university. According to the sensitivity of medical education and the importance of critical thinking skills in the health system and the diagnosis and treatment of patients, it is suggested that similar research be conducted in other universities of medical sciences.

Ethical consideration

This article is a part of the medical student dissertation of Ahvaz Jundishapur University of Medical Sciences, which has been approved with the number EDC-9841 and ethics code IR.AJUMS.REC.1398.871.

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