



Correlations Between Critical Thinking, Self-esteem, Educational Status, and Demographic Information of Medical Students: A Study from Southwestern Iran

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Abstract

Background: Critical thinking and individual characteristics are essential components of conscious decision-making and professional competence in medical students. The critical thinking abilities of medical students have a significant impact on their professional decision-making process. It may have direct and indirect consequences on the quality of medical care.

Objectives: This study aimed to investigate the correlation between self-esteem, demographic information, educational status, and critical thinking of medical students.

Methods: This descriptive cross-sectional study was conducted on 380 medical students in 2019. Data were collected using California Critical Thinking Skills Test (CCTST) and the Rosenberg Self-Esteem Scale (RSES). Quantitative variables were expressed as the mean and standard deviation and frequency and percentage were used to describe the qualitative variables.

Results: The results of the study revealed that 332 (87.4%) of the medical students who participated in the study had a negative inclination towards critical thinking, and 48 (12.6%) had an ambivalent inclination. The average self-esteem score of the students was 3.09 ± 3.35 . Moreover, there was a positive and significant correlation between critical thinking scores and self-esteem in medical students (correlation coefficient = 0.848; $P < 0.001$). An increase in the grade level increased the critical thinking score of the students. Moreover, there was no significant relationship between overall scores of critical thinking with students' age, gender, marital status, and place of residence.

Conclusions: In the current study, critical thinking scores of medical students were lower than average level and weak, and there was a direct and positive relationship between critical thinking and self-esteem. Given the importance of critical thinking abilities in the clinical decision-making process, university educators are expected to pay more attention to developing this skill in medical students.

Keywords: Critical Thinking, Self-esteem, Medical Students

1. Background

During this period of globalization, it is expected that people have all the abilities and capabilities that are necessary for every aspect of their life, including business, education, medicine, and the market (1). Many researchers have so far reported critical thinking skill in different ways based on their observations and experiences. According to Florea et al. critical thinking is a fundamental ability developed by teachers and professors for learning (2). Bassham describes critical thinking as helpful in improving one's ability to understand, construct, and make decisions and to free oneself from prejudice (3). In addition, Djumanova

et al. noted that "improving critical thinking skills is very important for learners in any field because how knowledge is acquired depends on how one thinks" (1).

Today, physicians in healthcare and clinical therapy face more complex issues and problems. Therefore, they should develop their critical thinking skills to make better decisions, because critical thinking strengthens the physician's clinical decision-making power. It increases the recognition of the patient's needs and helps the physicians to decide on a better method (4, 5). Different definitions are provided for critical thinking and there is some confusion about it. In general, however, critical thinking is a continuous and active cognitive process. The individ-

ual searches and analyzes different issues based on specific principles and methods, interprets complex ideas, considers all aspects of a situation, discusses it, and ultimately makes a decision. Critical thinking is a process of analyzing, evaluating, and improving thinking about any subject, content, or form which enhances the quality of one's thoughts (6, 7).

Self-esteem is considered an essential indicator of mental health that can be estimated in psychology. Self-esteem is determined by different factors, including one's thoughts, feelings, and experiences throughout life. Numerous factors can affect self-esteem based on the culture, including body image dissatisfaction, education, country, and family experiences. The overall level of self-esteem is affected by criteria that may vary from person to person (8-11). Researchers have reached the conclusion that identifying the barriers to critical thinking development in the medical education system can help students to augment and improve it (12-14). Since medical graduates are expected to have critical thinking and make appropriate decisions in the clinical environment, it is necessary to determine the factors influencing their critical thinking ability. Given the importance of these variables and the fact that few studies have been conducted on these issues in our country, the present study aimed to determine the relationship between critical thinking, self-esteem, educational status, and demographic information in medical students in 2019.

2. Methods

This descriptive cross-sectional correlational study was conducted in 2019 on medical students of Ahvaz Jundishapur University of Medical Sciences, one of the major universities of the southwest of Iran. According to the following equation and reviewing a related study, the number of participants estimated to be 385 (15).

$$n = \frac{\left(Z1 - \frac{\alpha}{2}\right)^2 pq}{d^2}$$

$$n = \frac{1.95^2 \times 0.5 \times 0.5}{0.05^2}$$

$$= 385$$

Participants were selected through cluster sampling and informed consent was obtained from them. Initially, 400 medical students were admitted to the study, and then the incomplete questionnaires were eliminated, and finally, 380 cases remained in the study. Inclusion criteria were age of 18 - 30 years, medical students, physical

health, no previous/present mental illness, and willingness to participate in the study. Exclusion criteria were incomplete or missing questionnaires. All the eligible students were invited from the teaching hospitals to participate in the study. Then the participants were informed to provide written consent before participating in the study. The questionnaires were prepared in electronic form and given to the medical students. A questionnaire on demographic information was given to them (Table 1). To assess critical thinking, the California Critical Thinking Skills Test (CCTST) was used, and the Rosenberg Self-Esteem Scale (RSES) was utilized to evaluate self-esteem (16, 17). The CCTST questionnaire has 75 items and seven subscales of truth-seeking, open-mindedness, analytical power, the power of organizing, self-confidence, maturity, and adventure, and is scored on the Likert scale. The minimum and maximum scores of this test are 70 and 420 respectively. A score less than 210 means negative inclination towards critical thinking, a score between 210 - 279 means ambivalent inclination towards critical thinking, a score between 280 - 350 means positive inclination towards critical thinking, and a score higher than 350 represents a consistent and robust inclination towards critical thinking (18, 19). The self-esteem questionnaire includes 10 items measured on 2 points; agree or disagree. The results are interpreted and scored according to the guidelines (20).

2.1. Statistical Analysis

The mean and standard deviation were used to express quantitative variables and frequency and percentage were used to describe the qualitative variables. The normality of the data was evaluated using the Kolmogorov-Smirnov test. As the normal distribution assumption was not met, the non-parametric analysis was used. Spearman's correlation coefficient, Mann-Whitney U Test, and multivariate regression were used to investigate the data. P-values < 0.05 were considered to indicate statistical significance.

3. Results

In general, the findings obtained from the students' demographic characteristics and questionnaire scores are presented in Table 1 and Table 2 respectively. In addition, Table 3 presents the results of the relationship between critical thinking and self-esteem, and the impact of demographic variables on self-esteem and critical thinking.

The mean score of the California critical thinking questionnaire was 175.21 ± 26.43 , indicating that 332 students (87.4%) had a negative inclination towards critical thinking, 48 had an ambivalent inclination, and none had a positive inclination. The mean score of students' self-esteem was 3.09 ± 3.35 .

Table 1. Demographic Information

Variables	Values ^a
Age (22 - 28 y)	24.09 ± 1.59
Gender	
Female	167 (43.9)
Male	213 (56.1)
Marital Status	
Single	228 (75.8)
Married	92 (24.2)
Residence	
Dormitory	245 (64.5)
Non-dormitory	135 (35.5)
Grade Level (2 - 7 y)	5.35 ± 1.15

^a Values are expressed as No. (%) or mean ± SD.

Table 2. Critical Thinking and Self-esteem Scores of Participants

Variables	Mean	Standard Deviation
Critical thinking	175.2	26.4
Self-esteem	3.09	3.35

Table 3. The Relation Between Critical Thinking, Self-esteem Scores, and Demographic Variables

Variables	P-Value	
	Critical Thinking	Self-esteem
Age	0.239	0.017
Grade level	< 0.001	< 0.001
Gender	0.942	0.118
Marital status	0.654	0.407
Residence	0.955	0.375

The results of correlation tests showed a linear and significant relationship between self-esteem scores and critical thinking (correlation coefficient = 0.848; $P < 0.001$). The regression coefficient (R^2) was 0.717, which indicates a strong correlation between these two variables (Figure 1). The results of the overall scores of the two questionnaires of self-esteem and critical thinking with different variables are listed (Table 3). As can be seen, there was a direct and significant correlation between the critical thinking scores and the grade level, so that an increase in the grade level increased the critical thinking scores. However, there was no significant relationship between the critical thinking scores with students' age, gender, marital status, and residence. As can be seen, there was a direct and significant relationship between the scores of self-esteem with the participants' age and their grade level. An increase in

their age and grade level increased students' self-esteem scores. There was no significant difference between the self-esteem scores of male and female students, single and married ones, and those living in the dormitory or other places (Table 3).

4. Discussion

As members of a healthcare team, both physicians and nurses need to have high critical thinking skills, to increase the quality of care and improve treatment outcomes. Medical students' critical thinking abilities affect the professional decision-making process and may have direct and indirect effects on medical care quality. Therefore, strengthening critical thinking skills and identifying the influential and related factors are very important (21). The results of the present study showed that the average score of critical thinking of approximately 88% of the medical students of this university was negative, and about 12% of them had an ambivalent inclination towards critical thinking. None of the 380 participants had a positive inclination towards critical thinking. In line with the results of the current study, the investigation of the critical thinking skills of medical students of an Iranian university stated that 98.6% of students had negative critical thinking, 1.4% had ambivalence thinking, and none of them had a definite tendency to use critical thinking skills (19). In other studies, postgraduate students, especially doctoral students, were more inclined to critical thinking and self-esteem. It may indicate that thinking and reasoning processes and argumentative discussions are more emphasized in higher education than primary education (22, 23). A study conducted in China showed that critical thinking was positive in medical and nursing students. Gender and age significantly impacted critical thinking abilities of students and critical thinking score was higher in medical students than nursing students (24). Due to the differences in the number of medical students participating in different studies, more research is needed to compare the differences in critical thinking of different medical students in several regions.

In the present study, there was a direct and significant relationship between self-esteem with students' age and grade level, so that increasing age and grade level increased self-esteem scores. A study examining the relationship between age and self-esteem revealed that self-esteem is independent of age and that individuals have reported varying degrees of self-esteem as they age (25). Critical thinking also had a significant and direct relationship with the grade level, but no significant relationship was observed between students' age and critical thinking scores.

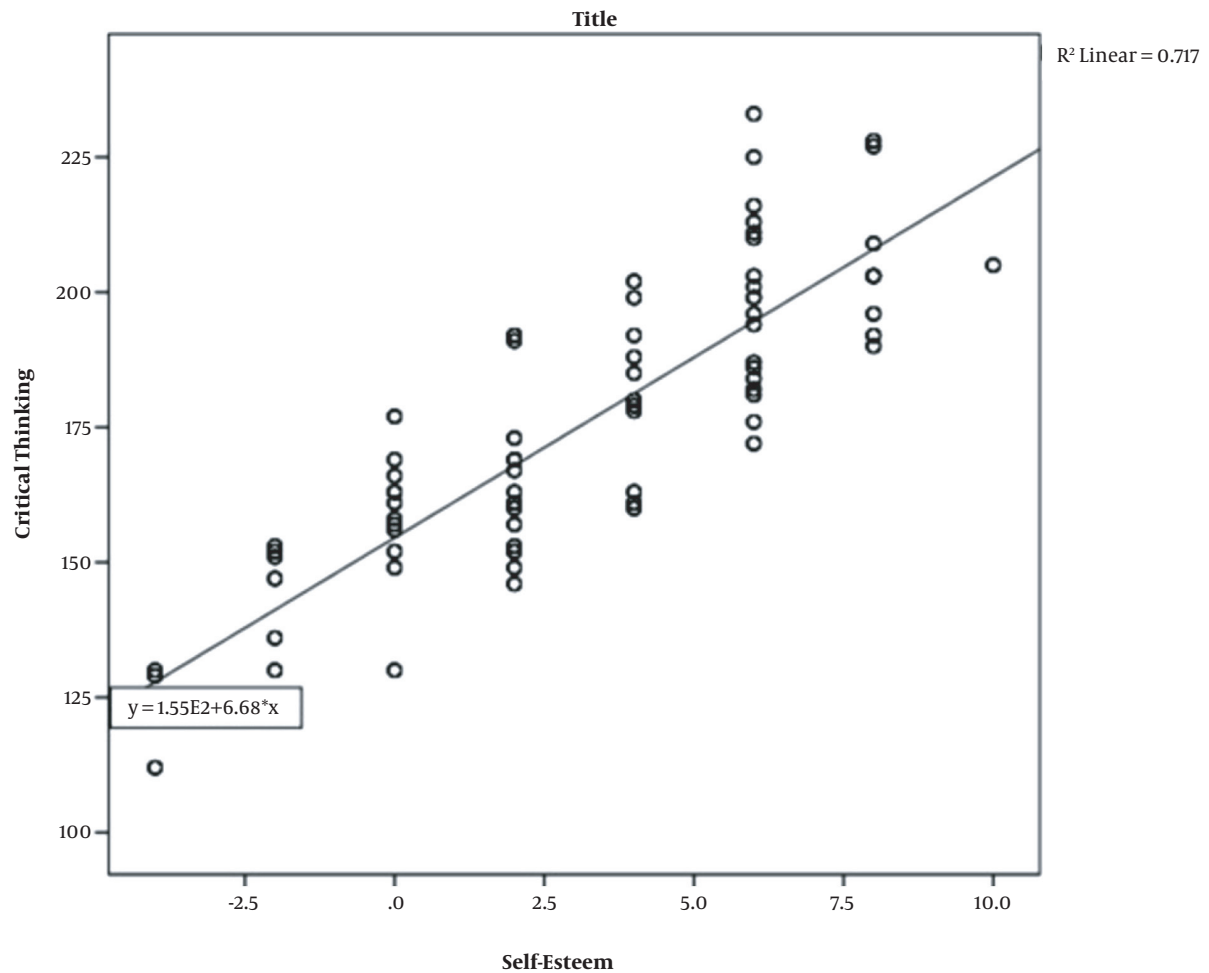


Figure 1. Correlation of self-esteem and critical thinking in medical students [regression coefficient (R^2): 0.717]

The reason can be attributed to the fact that because medical students are usually expected to gain more experience as they learn skills and continue their higher education, they seem logical. So, educational strategies during acquisition improve students' critical thinking skills. In general, similar results are obtained in our country, indicating a low level of critical thinking skills in medical students. A similar study examined the effect of parenting skills on the critical thinking of medical students and revealed that overprotective parents, emotional warmth and understanding, rejection, and over-interference were significant predictors of critical thinking in medical students (26). A study in Iran examined the barriers of critical thinking in medical students' curriculum. The barriers included the resistance to critical society, intellectual tension, personality characteristics, lack of understanding of society's need for criticism, the rule of traditional teaching

patterns, lack of critical thinking skills, ineffective evaluation, and difficulty of critical thinking training (12). A review study investigated the critical thinking skills of Asian and non-Asian nursing students and reported that Asian nursing students often had a lower score of critical thinking. In contrast, non-Asian nations had positive inclinations. These variations could be due to problems such as environmental issues, educational programs, and cultural differences (27).

As expected, the mean scores of the two questionnaires of critical thinking and self-esteem in male and female students were not significantly different. Many studies have shown that critical thinking and self-esteem are not affected by gender (28, 29). In the present inquiry, marital status, and place of residence (dormitory/other places) had no significant relationship with the critical thinking and self-esteem of medical students. Since self-esteem is a yield

of social life and the social environment has a significant impact on the development of self-esteem, it can be considered as one of the components of motivation in educational contexts and the instruments that are correlated with its promotion should be emphasized (15, 30).

There was a positive relationship between self-esteem and empathy. Self-esteem is one of the many factors that increase medical students' empathy. Age, academic pressure, attitude towards empathy, and future career also play a critical role in medical students' empathy. Enhancing medical students' self-esteem may be effective in improving medical students' empathy (31).

It seems that self-esteem is one of the emotional dimensions of critical thinking that should be developed or strengthened. In this regard, faculty heads have a supportive role in developing the critical thinking skills of students in line with professional principles and foundations. In other words, independence and self-esteem are essential to developing critical thinking skills.

4.1. Limitations of the Study

The limitations of the study were the small sample size, the low excitement and motivation of students to participate in the study, and the time-consuming process of completing the questionnaires. It should be noted that this study examined only medical students of Ahvaz Jundishapur University of Medical Sciences, so the generalization of results to other universities in the country should be made with caution and by conducting more studies with more sample size.

4.2. Conclusion

The current study showed that the mean scores of the inclination towards critical thinking in medical students of Ahvaz Jundishapur University of Medical Sciences were low, and none of them had a strong and positive inclination towards critical thinking, and the self-esteem scores of these students were relatively moderate. There was also a direct and significant relationship between critical thinking and the self-esteem of these students. Therefore, considering the positive effects of critical thinking on the education process, it is possible to promote and improve students' critical thinking by strengthening and raising self-esteem.

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Footnotes

Authors' Contribution: Study concept and design, A.K, A.D; Acquisition of data, S.G; Analysis and interpretation of data, A.D, A.K; Drafting of the manuscript, M.S, A.D; Critical revision of the manuscript for important intellectual content, A.D, M.S; Statistical analysis, S.G; Administrative, technical, and material support, A.D, A.K; Study supervision, A.D.

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