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# Critical thinking skills among Healthcare Management college students: a case study in Iran: a study conducted in 2016

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## *Abstract*

***Introduction:*** One of the essential skills which helps healthcare management students succeed in leadership is development of critical thinking skills during their education. Our study objective was to assess critical thinking skills among healthcare management students of Shahid Sadoughi University of Medical Sciences in 2016.

***Methods:*** A descriptive, cross-sectional study was conducted among 90 healthcare management students in two bachelor and master' degree studying in health faculty of Shahid Sadoughi University of Medical Sciences in 2016. To gather data, a standard questionnaire "California Critical Thinking Skill Test (CCTST)" was used and data were analyzed by SPSS 16 through descriptive and analytical statistical tests

***Results:*** Mean scores of critical thinking skill and its different dimensions were in a moderate level indicating its satisfactory condition among participants. Results of correlation test among study variables only confirmed a significant statistical relation between evaluation aspect and education degree ($p<0.05$). Moreover a direct significant correlation was recognized between the score of critical thinking skill and its related dimensions ($p<0.05$).

***Conclusion:*** Findings revealed that total score of students' critical thinking skills was within the norm range; but their weakness in some aspects highlighted the importance of constant development of such skills among healthcare management students to help them better succeed in leadership tasks

***Keywords:*** Critical thinking, skill, student, evaluation

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## Introduction

Nowadays, employers look for employees with compatible education for mentioned career also those having necessary skills to make evidence based and practical decisions to resolve organization's problems in an effective way. Such skills are often placed in an area of critical thinking (1). Critical thinking as one of the important skills is stressed in many educational programs especially in the field of medicine and health sciences (1). Development of such skills is so important that some experts in behavioral and education sciences have mentioned it as a major educational goal for students (2, 3).

On the other hand, healthcare authorities including hospital managers are expected to develop their skills in critical thinking, decision making and predicting future events to ensure that management of organizational processes is in an orderly mode and consequently provide safe and sufficient care for patients (4, 5). As those working in medical and health sciences fields have more sensitive role in dealing with people's health through having close and direct relation with patients, attainment of such skills has got a special importance due to their positive effect on quality of healthcare services. For the purpose, trainers put emphasize on development of critical thinking skills among learners (6).

Critical thinking has been defined in many studies. A definition by National Council for

Excellence in Critical Thinking mentioned such a skill as "intellectually well-ordered process of thinking, discovering and evaluating data gathered through surveillance or communication" (7). Though, many researchers confirm that critical thinking also consists of necessary dispositions which belongs to an individual's desire to apply critical thinking ability in different conditions (8, 9). There are two aspects for critical thinking including cognitive skills and affective dispositions. Cognitive critical thinking skills mainly denote observation and scrutiny, enquiry, analysis, research and exploration, evaluation, interpretation and rationalizing while the latter refers to truth seeking, criticism, analyticity, systematicity, self-confidence, open mindedness and maturity (8, 10, 11).

Worldwide many researches revealed that training critical thinking could be effective in promoting problem-solving skills, decision-making and creativity (12). Paul et al conducted a study in 1995 to assess the effectiveness of educating critical thinking principles in problem-solving skills of college students. Results indicated that a large majority of students lacked appropriate thinking skills to resolve organizational problems. In fact existing training courses were not sufficient for

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developing critical thinking skills among learners and failed to empower them in holistically reasoning and effectively decision making (13). Regarding the importance of each critical thinking aspect, a recent study conducted in 2011 among medical students concluded that most participants regarded critical thinking as an ability while a small number described it as a disposition or personality trait (5). Some other studies also found that lack of critical thinking was mainly due to nonexistence of dispositional approach rather than cognitive ability (14). Despite differences among various schools of thought for critical thinking, most researchers agree on specific abilities that learners should be equipped with to increase the probability of fostering such skills. Investigation and analysis, inductive or deductive reasoning, inquiry for clarification, interpretation, forecasting and extrapolation, problem solving and evaluation were among important skills mentioned in this regard (8, 15-17).

Given that critical thinking is part of cognitive development, many universities and educational bodies that deliberately try to increase students' critical thinking skills want to measure the effectiveness of such improvements. Some assessment tools exist for the purpose include Watson-Glaser Critical Thinking Appraisal (WGCTA) test, Thurston Test of Mental Alertness, Cornell Critical Thinking Test, and California Critical Thinking Skills Test (CCTST). Among which, CCTST is an objective measure for evaluating individuals' critical thinking skills. As the questionnaire has been used in many countries worldwide, its usefulness was verified (8).

Due to the importance of assessing learners' critical thinking skills to determine existing weaknesses that need appropriate planning for improvement also given the important role of health care managers in ensuring the effectiveness of health services provided by health institutions, we conducted a study to evaluate critical thinking skills among healthcare management students of Shahid Sadoughi University of Medical Sciences in 2016.

**Methods**

A descriptive, cross-sectional study conducted among all healthcare management students studying in both bachelor and master's degree in health faculty of Shahid Sadoughi University of Medical Sciences in a time period June-November 2016. A total of 90 students were included in the research which due to their limited number, a census selection method was used. There were 24 participants in bachelor degree studying in the first semester, 16 in the third and 18 in each of the fifth and seventh semesters. Also in master's degree, 6 individuals from semester one and 8 students in semester three were selected for the research. A



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standard questionnaire (CCTST) consisted of 34 questions in three subgroups of analysis (9 questions), inference (14 questions) and evaluation (11 questions) was used (8). Each 34 multi-choice questions had one correct answer and test score was number of items answered correctly ranging from 0 to 34. Those achieving score lower than 8.5 were regarded to have insufficient skill, those with 8.5-25.5 score were categorized in a moderate level and finally individuals' score above 25.5 were mentioned to have desirable skill in this regard. Furthermore, the interpretation of scores achieved in each subgroups related to critical thinking skill was done according to the following table.

*Table 1. Scoring System of Critical Thinking Skill's Subgroups*

| Critical thinking skill's subgroups | Weak | moderate | strong |
|---|---|---|---|
| **Evaluation** | <3.5 | 3.5-10.5 | 10.5-14 |
| **Analysis** | <2.25 | 2.25-6.75 | 6.75-9 |
| **Inference** | <2.75 | 2.75-8.25 | 8.25-11 |

CCTST as a measurement tool has been validated to evaluate critical thinking skills among students of different fields (8). The questionnaire reliability was checked in a panel of experts specialized in English language and its internal consistency was calculated to be 0.68-0.7 using KR-20 (8). Data analysis was done by SPSS Software Package version 16 using descriptive and analytical statistical methods

## Results

Demographic characteristics of study participants depicted that of the total participants, 84.4% were bachelor student. Among which 31.57% were studying in the first semester, 21.05% in the third and 23.69% in each of the fifth and seventh semester. Master's students consisted 15.5% of the participants which 42.85% of them were studying in first and 57.2% in third semester. Furthermore 80% of the students were female and 56.6% were upper than twenty years old.

As table 2 shows the highest mean score relating to critical thinking skill among students upper than 20 years old belonged to evaluation ($4.94\pm0.28$) while the lowest score was related to analysis ($2.6\pm0.23$). The total mean score of critical thinking skill in two category of students' age groups were relatively $10.84\pm0.68$ among those younger than 20 years old and $11.31\pm0.65$ in those older than the year confirming the idea that students had strong ability for such type of thinking. Furthermore, no statistical significant relation was seen between different aspects of critical thinking



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Skill and age variable (p>0.05) .

*Table 2. Mean Scores Related to Different Aspects of Critical Thinking skill by Two Age Groups*

| Variable | Critical thinking skill | evaluation | analysis | inference |
|---|---|---|---|---|
| **≤20 years old** | 10.84±0.68 | 4.2±0.29 | 2.71±0.26 | 3.92±0.3 |
| **>20 years old** | 11.31±0.65 | 4.94±0.28 | 2.6±0.23 | 3.76±0.31 |
| **p-value** | 0.62 | 0.08 | 0.75 | 0.72 |

Also table 3 shows that the highest mean score related to critical thinking skill belonged to evaluation among male students (5.27±0.41) while the lowest was affiliated with analysis among female students (2.56±0.17). Total mean score of critical thinking skill in two gender groups were relatively 11.72±1.07 in male and 10.95±0.53 in female students. As a whole an average score of critical thinking skill in male was higher than female except for inference which confirmed that male students had strong ability for critical thinking. Furthermore, no statistical significant relation was seen between students' gender and critical thinking domains (p>0.05).

*Table 3. Mean Scores Related to Different Aspects of Critical Thinking Skill by Two Gender Groups*

| Variable | Critical thinking skill | evaluation | analysis | inference |
|---|---|---|---|---|
| **Male** | 11.72±1.07 | 5.27±0.41 | 3±0.51 | 3.44±0.46 |
| **Female** | 10.95±0.53 | 4.45±0.23 | 2.56±0.17 | 3.93±0.25 |
| **p-value** | 0.52 | 0.11 | 0.32 | 0.35 |

Study results also showed that the highest mean score was related to evaluation aspect of critical thinking skill among MSc students (5.92±0.56) while the lowest score belonged to analysis among bachelor students (2.64±0.19). As data in table 4 depicts, MSc students had stronger ability in critical thinking compared to those studying in bachelor degree (12.64±1.13; 10.82±0.51). Furthermore, among study variables a statistical significant relation existed between educational degree and evaluation aspect (p<0.05).

Table 4. Mean Scores Related to Different Aspects of Critical Thinking Skill by Two Educational Degree Groups

| Variable | Critical thinking skill | evaluation | analysis | inference |
|---|---|---|---|---|
| **Bachelor** | 10.82±0.51 | 4.38±0.21 | 2.64±0.19 | 3.8±0.24 |
| **MSc** | 12.64±1.13 | 5.92±0.56 | 2.71±0.36 | 4±0.49 |
| **p-value** | 0.16 | 0.007 | 0.85 | 0.75 |



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As data in table 5 depicts, mean scores of all critical thinking skill sub groups were upper than a moderate level. In fact no statistical significant relation was seen between critical thinking aspects and study semester (p>0.05).

Table 5. Mean Scores Related to Different Aspects of Critical Thinking Skill by Semester Study Groups

| Variable | Critical thinking skill | evaluation | analysis | inference |
|---|---|---|---|---|
| **Bachelor-Semester 1** | 10.95±0.97 | 4.12±0.42 | 2.91±0.38 | 3.91±0.43 |
| **Bachelor-Semester 3** | 10.75±0.87 | 4.37±0.4 | 2.31±0.28 | 4.06±0.35 |
| **Bachelor-Semester 5** | 10.22±1.11 | 4.44±0.4 | 2.33±0.38 | 3.44±0.6 |
| **Bachelor-Semester 7** | 11.33±1.2 | 4.66±0.45 | 2.88±0.44 | 3.77±0.58 |
| **P-value** | 0.9 | 0.83 | 0.53 | 0.85 |
| **Master-Semester 1** | 12.5±0.92 | 6.61±0.54 | 2.83±0.65 | 3.5±0.34 |
| **Master-Semester 3** | 12.75±1.92 | 5.75±0.94 | 2.65±0.46 | 4.37±0.82 |
| **p-value** | 0.9 | 0.73 | 0.79 | 0.4 |

As a whole, there was statistical significant correlations between critical thinking skill and Its subgroups (table 6).

Table 6. Correlation between Critical Thinking Skill and its Subgroups

| Critical thinking skill | evaluation | analysis | inference |
|---|---|---|---|
| **Correlation coefficient** | 0.79 | 0.75 | 0.79 |
| **p-value** | <0.001 | <0.001 | <0.001 |

## Discussion

Study findings revealed that healthcare management students had an average level skill in critical thinking confirming the idea that students were somehow equipped with skills needed for such type of thinking. Gharib confirmed the finding and found that the total score of critical thinking skill (CTS) among students was in a normal limit (18). Consistently in a study conducted by Babamohammadi, mean score of critical thinking skill among bachelor students was 12.34±2.45 emphasizing on the moderate level of students' ability (19). Dissimilar to our findings, many studies conducted on assessment of critical thinking skills among Iranian students have reported poor CTS among study participants (18-21). Sharp et al indicated



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that a considerable number of students participating in the study had weak critical thinking skills while only 3.5% were in a desirable level regarding to this criterion (22). Similarly Arum and Roksa evaluated students' critical thinking skill at a weak level or even nonexistent (23).

Additionally, no significant differences were seen between total mean scores of CTS in bachelor and master's students. Also no significant association was found between students' scores and variables such as age, gender and study semester. These findings were consistent with the results of previous studies (20, 24, and 25). Carol (1997), Bet and Sullivan (1997) and Shin (1998) emphasized that CTS was not different among various age or gender groups (26-28). However, Zhang and Lambert also Noohi et al reported a number of positive and negative correlations between demographic variables and critical thinking skills (29, 30). Additionally Khalili et al, Babamohamadi and Khalili recognized significant differences between CTS among students with different educational degrees which was not in line with our study results (19, 31). Carroll indicated a positive significant relation between total mean score of CTS and study semester and Sharp et al concluded that critical thinking skills among bachelor students were lower than those of master's (22, 26). Although our findings supported the idea but statistical analysis did not confirm any significant correlation between variables. Giving the results, it is obvious that despite existing pitfalls in educational system of the country, studying in university can to some extent positively affect students' CTS improvement. Results obtained by Hosseini and Bahrami were also in accordance with our findings (6). However in a study conducted among medical sciences students in Isfahan University of Medical Sciences, revealed no improvement in students' CTS after passing study semesters. The reason might be due to the fact that although educational programs play an important role in improvement of CT skills but all universities or colleges do not perform effectively for such improvement (32). Babamohammadi in a study conducted among nursing students of Semnan University of Medical Sciences, found a significant difference between CTS scores of students studying in different semesters of continuous bachelor degree but the same as our findings, no significant correlation was found between students' age or gender and their CTS score (19). In another study conducted among nursing students findings revealed significant differences between the development of CTS among different educational degrees of diploma, associate, master's or PhD educational programs (33).

There are some limitations regarding to the study. First, data collected for this research was



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based on a population size of 90 participants; second assessing critical thinking skills among healthcare management students was conducted through self-assessment which is less precise than formative assessment results. A suggestive line of enquiry is to longitudinally test the critical thinking skills of students over time after the same group of participants had undertaken a series of critical thinking courses. Such a study would provide proper evidence about the value of courses in improving participants' critical thinking skills.

## Conclusion

Critical thinking as an important factor helps healthcare professionals to ensure provision of liable services leading to quality improvement of care rendered to patients. Managers who had learned critical thinking skills and have developed abilities such as evaluation, analysis and inference during their college time, would be more ready to apply such type of thinking in their professional lives. Given the importance of critical thinking skill and the fact that in our study the overall students' ability in applying critical thinking has been evaluated in a moderate level, research findings emphasized on significance of continuous reinforcement of such skills among college students.

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# بررسی سطح مهارت تفکر انتقادی در دانشجویان رشته مدیریت خدمات بهداشتی درمانی در دانشکده بهداشت دانشگاه علوم پزشکی شهید صدوقی یزد در سال ۱۳۹۵

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## چکیده

**مقدمه:** یکی از مهارت‌های کلیدی که به دانشجویان مدیریت خدمات بهداشتی و درمانی در رهبری موفق آینده سازمان‌ها کمک خواهد کرد، توسعه مهارت تفکر انتقادی در طول تحصیل می‌باشد. هدف مطالعه حاضر بررسی وضعیت مهارت تفکر انتقادی در دانشجویان این رشته در دانشگاه علوم پزشکی شهید صدوقی یزد در سال ۱۳۹۵ بوده است.

**روش کار:** این مطالعه از نوع توصیفی مقطعی بوده که در سال ۱۳۹۵ در بین کلیه دانشجویان رشته مدیریت خدمات بهداشتی و درمانی در دو مقطع کارشناسی و کارشناسی ارشد دانشکده بهداشت دانشگاه علوم پزشکی شهید صدوقی یزد انجام شده است. به منظور جمع آوری داده از پرسشنامه استاندارد "مهارت تفکر انتقادی کالیفرنیا" استفاده شد و داده‌های بدست آمده از طریق نرم افزار SPSS نسخه ۱۶ مورد تجزیه و تحلیل آماری قرار گرفت.

**یافته ها:** نمره میانگین مهارت تفکر انتقادی و ابعاد مختلف مربوط به آن در سطح متوسط ارزیابی شد که نشانه وضعیت نسبتاً مطلوب آن در میان دانشجویان مورد مطالعه بود. یافته های بدست آمده از آزمون همبستگی آزمون همچنین نشان داد که بین متغیرهای مقطع تحصیلی دانشجویان و بعد ارزیابی در مهارت تفکر انتقادی ارتباط آماری معنادار وجود داشته است ($p<0.05$). به علاوه ارتباط معنادار میان نمره مهارت تفکر انتقادی و ابعاد تشکیل دهنده آن مشاهده گردید ($p<0.05$).

**نتیجه گیری:** یافته های مطالعه حاکی از آن بود که دانشجویان از حیث مهارت تفکر انتقادی در سطح متوسط قرار داشته و در ارتباط با برخی ابعاد ضعف‌هایی نیز مشاهده می‌شود که همین امر اهمیت رشد و توسعه مستمر چنین مهارت‌هایی را به منظور تقویت توانمندی های رهبری در دانشجویان گوشزد می‌کند.

**واژگان کلیدی:** مهارت تفکر انتقادی، دانشجویان، ارزیابی.

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