Original Article

Critical Thinking Disposition among Medical Students of Kermanshah University of Medical Sciences

Shirin Iranfar Ph.D.[1], Vida Sepahi M.Sc.[1]*, Ahmad Khoshay M.Sc.[2], Mansour Rezaei Ph.D.[3], Behzad Karami Matin Ph.D.[4], Farahnaz Keshavarzi M.D.[5], Homayoun Bashiri M.D.[6]

1. Education Development Center, Kermanshah University of Medical Sciences, Kermanshah, Iran

2. Dept. of Nursing, School of Nursing and Midwifery, Kermanshah University of Medical Sciences, Kermanshah, Iran

3. Dept. of Biostatistics, School of Public Health, Social Development and Health Promotion Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran

4. Dept. of Public Health, School of Public Health, Kermanshah University of Medical Sciences, Kermanshah, Iran

5. Dept. of Gynecology and Obstetrics, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran

6. Dept. of Internal Medicine, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran

**Email: vida.sepahi@Kums.ac.ir*

(Received: 28 Jun 2012 Accepted: 29 Oct 2012)

Abstract

Introduction: Critical thinking as a process of purposeful self-regulatory judgment leads to problem solving and correct decision making in individuals. In the modern world, health care faces rapid change and burgeoning amount of knowledge. Possessing critical thinking is essential for individuals in health care centers, specially when they are forced to solve clinical problems. The aim of this study was to evaluate critical thinking disposition among medical students in various levels of education.

Methods: In this descriptive, cross-sectional study, we determined critical thinking disposition among 259 medical students of Kermanshah University of Medical Sciences. The students were studying at different levels of general physician education. In Iran general physician education divided into four levels; basic sciences, physiopathology courses, clerkship and internship. They were selected using stratified sampling. Data were collected using a questionnaire that consisted of two parts; demographic information of the participants and California Critical Thinking Disposition. To analysis the data, both descriptive and inferential statistics (One-way ANOVA) were employed using SPSS-16 software.

Results: Our findings indicated that 98.6% of the students lacked critical thinking disposition, 1.4% were ambivalent disposition and no one had positive disposition to critical thinking. The highest acquired score of critical thinking was for truth-seeking (20.4%) and the lowest score acquired for analyticity (4.8%). The results revealed that there was no statistically significant difference between mean score of participants with regards to their critical thinking disposition in various educational levels.

Conclusion: The findings of this study indicated that medical students lacked appropriate critical thinking disposition.

Keywords: Medical students, Critical, Thinking

Citation: Iranfar Sh, Sepahi V, Khoshay A, Rezaei M, Karami Matin B, Keshavarzi F, Bashiri H. Critical thinking disposition among medical students of Kermanshah University of Medical Sciences. Educ Res Med Sci. 2012; 1(2): 63-68.

Introduction

Critical thinking (CT) as a process of purposeful self-regulatory judgment leads to problem solving and correct decision making in individuals (1). In the modern world, health care faces rapid change and burgeoning amount of knowledge. Possessing CT is essential for individuals in health care centers, specially when they are forced to solve clinical problems (2). CT is an essential component of the clinical decision-making and professional competence. Suppressing independent and powerful thinking, having anxiety in unfamiliar situations, increasing medical treatment errors are the negative consequences of lack of CT (3). In clinical practice and clinical conditions CT is highly prized and clinical decision making requires applied clinical knowledge, data gathering skills and knowledge of application of strategies for solving problems related to the patients (4).

Medical education system is now in challenge of fulfilling the community expectations for health improvement. Therefore, rearing graduate students as efficient and creative thinker and good decision–makers, based on regional, national and international standards appears to be essential (5). CT includes two scopes of disposition and skills. Skill forms the cognitive and disposition forms the emotional aspects of CT. Therefore, critical thinking skill (CTS) refers to cognitive ability and critical thinking disposition (CTD) is considered as an aspect of personality (6). Cognitive component in CT means having an outlook in a certain rule for analyzing problems and materials. Nevertheless, the emotional component can also have the same significance (7).

Some researchers believe that if the learners do not have any CTD to search the world, teaching the content and skills will be trivial. Therefore, having CTD means that the critic person in addition to having adequate skills for searching facts, causes and evidence must have enough motivation for searching them (8).

Gharib et al. (2009) in a descriptive, cross-sectional study on 60 fresh and senior students of health-care management showed that the total score of CTS in both groups was in normal range and there was no statistically significant difference between them. Regarding CTD, there was statistically significant difference between senior and junior students and the scores of senior students were higher than those of fresh students (9). Barkhordari et al. (2009) in a study demonstrated that the majority of students (81/8%) have instable CTD and none of them has profound and powerful CTD. 73/5% of studied students have average self esteem (3).

May et al. (1999) in a study done on nursery students showed that the total score obtained from questionnaire of CTD was 311 which was higher than mean score and score under scales, except disposition to truth-seeking was high (10). In another study, Sigrid et al. studied the CTD among newly graduate nursery students. They found that 80% of the participants had positive CTD. The highest obtained score was related to inquisitiveness and the lowest one was related to truth seeking (11).

CT is important among medical students and only a few studies has been performed on CTD among them. As it is expected that medical students should have CTS to decide appropriately against illnesses in different circumstances, it is necessary to study the CTD in medical students in different education levels to find appropriate methods for to promoting it. We performed this study to determine the CTD of medical students in different educational levels at Kermanshah University of Medical Sciences (KUMS).

Methods

This descriptive and cross-sectional study was done on 259 medical students of KUMS to determine their CTD. The students were educational levels in basic sciences, physiopathology courses, clerkship and internship. They were selected using stratified sampling. Data were collected using a questionnaire consisted of two parts; demographic data of the participants and California Critical Thinking Disposition (CCTDI). The questionnaire included 75 items constructed based on Likert scale (from completely agree to completely disagree).

The highest and the lowest scores of CCTDI were 70 and 420, respectively. Scores less than 280 were considered as negative; 280 to 350 ambivalent, and scores higher than 350 were considered as having positive CTD. The time allocated for answering the questionnaire was 15-20 minute. Delphi Method was employed to obtain content validity of the questionnaire and its reliability was obtained using Cronbach alpha (0.90) (9). Both descriptive statistics (mean and standard deviation) and inferential statistics (one-way ANOVA) were employed to analyze the data ($P<0.05$).

Results

All 289 received questionnaires were analyzed. The mean age of students was 22.8±2.8 years. 56.4% were

women and 87.5% were singles. The results showed that the majority of students (98.6%) had weak CTD, 1.4% had ambivalent CTD and none of them had high disposition. As it is shown in table 1, among those with positive disposition; truth-seeking (20.4%) was the most common scope and analyticity (4.8%) was the least common scope. Table 2 illustrates that the mean scores of CTD of students in different levels of education such as basic sciences, physiopathology courses, clerkship and internship. The results of one-way ANOVA showed that there was no statistically significantly difference between the mean score of CTD in various levels of education.

Table 1: Distribution of scopes CTD (n=289)

scopes CTD	Positive (more than 40) % (n)	Ambivalent (30-40) % (n)	Weak (less than 30) % (n)
Truth-seeking	20.4 (59)	57.8 (167)	21.8 (63)
Open- mindedness	5.9 (17)	55.0 (159)	39.1 (113)
Analyticity	4.8 (14)	18.0 (52)	77.2 (223)
Systematicity	6.9 (20)	47.1 (136)	46.0 (133)
Confidence in Reasoning	6.6 (19)	20.4 (59)	73.0 (211)
Inquisitiveness	5.5 (16)	39.8 (115)	54.7 (158)
Maturity of Judgment	5.2 (15)	37.4 (108)	57.4 (166)

Table 2: Distribution of mean score's disposition to CTD based on levels of education.

levels of education	mean and standard Deviation	Amount of Certainty 95%	F ANOVA	P value
Basic sciences	212.12±23.48	206.89-217.35	1.292	NS
Physiopathology	207.22±28.72	200.21-214.23		
Clerkship	212.48±27.48	206.44-218.52		
Internship	216.75±30.31	208.91-224.58		
Total	212.05±27.40	208.87-215.22		

Table 3: Distribution of mean and standard deviation of total scores CTD and its scopes based on the levels of education.

	Mean and standard deviation			
	Basic sciences	**Physiopathology courses**	**clerkship**	**Internship**
Total scores CTD	212.12±23.48	207.22±28.72	212.48±27.48	216.75±30.31
Truth-seeking	34.81±6.61	35.40±5.60	35.85±7.38	36.11±7.73
Open- mindedness	30.51±4.06	31.67±5.31	32.62±4.27	33.21±5.07
Analyticity	26.43±6.62	26.26±5.47	26.57±7.06	28.08±6.98
Systematicity	32.68±6.03	29.82±7.14	30.15±6.92	30.70±7.20
Confidence in reasoning	27.70±7.73	25.95±7.29	26.71±7.97	27.45±8.69
Inquisitiveness	29.98±6.32	28.98±7.30	30.42±7.43	29.88±7.05
Maturity of judgment	29.98±5.17	29.11±6.54	30.13±6.98	31.30±5.61

Discussion

CTD in medical students was low. The highest score was related to the scope of truth-seeking and the lowest one was related to the scope of analyticity. The scope of truth seeking is one of the prime CTD. In fact, people who enjoy this disposition have courage to ask questions about different matters. These sorts of individuals always look for accurate and valid information, even if it does not follow their prior ideas (12), and the low CTD with regards to analyticity scope indicates the inability of the participants to solve the problems intelligently which may be the results of teaching method. Unfortunately, in our universities traditional method are still used and innovative teaching methods are not employed. Iranfar in a similar study on nursing and midwifery students in KUMS showed that about 9.7% of the students lacked the

ability and CTD and the rest had ambivalent CTD. The mean score of CTD among these students was (286.75±23.97). The highest mean scores belonged to analyticity scope (47.37±5.36) and the lowest one belonged to truth-seeking scope (30.39±6.48) (2).

Barkhordari showed that about 81.8% of nursing students had low CTD (3). While Gharib and Noshadi found that the mean score of CTD was higher than that of the similar studies done in Iran. Gharib in a study on graduate students of Tehran University of Medical Sciences found that the mean score of CTD was 278.6, the highest mean score belonged to analyticity scope (41.98) and the lowest one belonged to truth-seeking scope (38.31). Noshadi also has come to similar results in a study on students in different fields and different levels of education. The results of his study showed that graduate students especially in Ph.D. level have more CTD. This issue indicates that in M.Sc and Ph.D. levels more is emphasized on CT and argumentation processes. Since in these levels students should prepare their dissertation, they have more CTD process and argumentation (8, 9). In fact, one method for teaching CT is doing research, which is a student-centered activity in class.

In another study, the mean score of CTD of nursing students in Canada was reported to be 312.3 while this figure was 301.7±29.1 for health students (13). In another study done on nursing students in Australia and China it was found that the total score of CTD were 287.73±30.98 and 268.36±21.58, respectively. The highest score was related to inquisitiveness (Australia 46.29±6.56 and China 43.60±5.79 (14). The results of this study showed that in all the scopes of CTD the mean score of Australian students was higher than that of Chinese. In a research which was accomplished on medical students in Campbell University the total score of CTD was 302.2±25.7 (15). In another research which was done in 27 nursing colleges, on nurses who have just graduated in Norway it was found that about 80% of the participants have positive CTD (11). McGrath in his research on nursing students in Canada found that the mean score of CTD was 312.3, which shows a positive disposition of these students to CT (16).

The results of present study showed that the obtained scores from basic sciences to internship level had upward trend and only in physiopathology courses, it had downward trend (Table 3, Figure 1). However, it was found that there was no statistically significantly relationship between the scores of the CTD and educational levels, though it is expected that students, via gathering enough experience and entering higher levels of education develop much more CTD and use more CTS. But the reason why medical students in physiopathology courses show less CTD is a not clear and needs to be further studies. It seems that in this level, students for the first time in their life faced with concepts such as health and disease and passed semiology course in hospital. Students at this level should be able to connect the basic materials they have already learned to the new materials in order to understand them well and properly. Facing to such great amount of information about just disease may confuse students and in this situation most of them consider themselves incapable and incompetent in understanding this information. Some researchers believe this situation may influence the CTD.

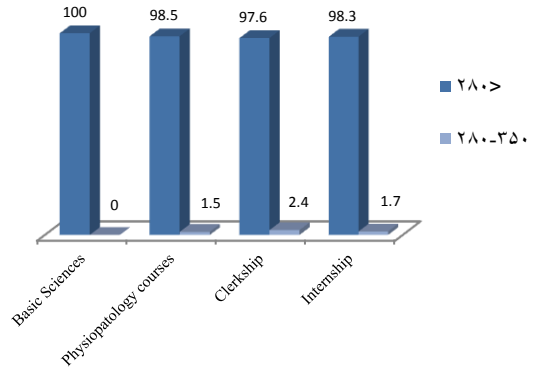

Figure 1: Distribution of CTD based on the levels of education among students.

Similar studies have controversial results. In a study done on medical, nursing, and midwifery students of Bushehr University of Medical Sciences, Azodi et al. came to this conclusion that the score of CT of these students had upward trend compared to other students, although this increase was not statistically significant. They believed that the reasons for this difference were longer duration of clinical training of medical students and introducing various diseases and clinical decisions to them. Kathleen believed that introducing disease in clinical situation and using problem-solving procedures and making decision may lead to the improvement of CTD of medical students (17), while the results of the studies done by researchers such as Shafiei (18), Ranjbar (19), Zarghi (20), Mirmolaei (21) and Abdehag (22) all indicated that there was no statistically significantly difference in the scores of fresh and senior students with regards to CTD. On the other hand, McGrath in a study done on fresh and senior students came to this conclusion that the mean score of CTS from fresh to senior students, except junior students, had increased although this increase was not statistically significant (16).

Robert also did not observed any statistically significantly difference in his research between fresh and senior pharmacy students with regards to their CTD (15), while findings of Baba Mohamadi showed that there was a statistically significantly difference between fresh and senior students (23). Hoseini has done a research on fresh and senior bachelor students of Isfahan University of Medical Sciences in order to compare their CTD. He found that the mean score of senior students was lower than that of the fresh students and consequently the mean scores in fresh and senior students was statistically significantly different from each other (24).

Amini in a study done on the relationship between CTS and educational level of medical students found that there was no statistically significantly difference between total score of CT and educational level of students, however, with regards to inference scope internship students had better performance than other two groups (25).

Gharib et al. in their studies on mastery students came to this conclusion that there was a statistically significantly difference between fresh and senior students with regards to their CTD and the score of senior students was higher than that of the fresh ones (9).

Finally, the results obtained by Baba Mohamadi in a study done on bachelor students were different from the results of other studies (23). The findings confirm that CTS of the students during their education will not be developed merely by listening to instructors' speech or by reading books or giving tests without manipulating active procedures of learning. In other word, merely transferring information is not appropriate for thinking, but providing appropriate condition for thinking is also essential so that the students come to appropriate belief credence and knowledge.

Conclusion

Findings of this study illustrate that medical students lack the disposition to critical thinking. It seems that our educational system requires to be revised in order to improve students' critical thinking dispositions.

Acknowledgement

This article is a part of master dissertation of medical education and approved plan of Vice Chancellery of Research and Technology of KUMS. The researchers express their greatest gratitude to Dr. Gelareh Hatam and all the students who took part in this study.

References

1. Khalilzadeh N, Soliamannejad A. Critical thinking. 1th ed. Qom: Mehr Amiralmomenin publication; 2004. [Persian]

2. Iranfar Sh. A study of developing critical thinking in the students of nursing through collaborative and individual methods of learning in the Kermanshah, Iran (Dissertation). University of Mumbai; India, 2009.

3. Barkhordari M, Jalalmanesh S, Mahmoudi M. The relationship between critical thinking disposition and self esteem in third and fourth year bachelor nursing students. IJME. 2009; 9(1): 13-19. [Persian]

4. Myrick F, Younge O. Preceptor questioning and student critical thinking. Journal of Professional Nursing. 2002; 18(3): 167-181.

5. Hasanpour M, Mohammadi R, Dabbaghi F, Haghdoost Oskouie F, Yadavar Nikravesh M, Salsali M, et al. The need for change in medical sciences education: A step towards developing critical thinking. Iran Journal of Nursing. 2005; 18 (44): 39-49. [Persian]

6. Facione P, Facione N, Giancarlo C .California critical thinking disposition inventory: Inventory manual. Millbrae, CA: The California Academic Press. Published by insight assessment; 2001.

7. Bigdeli H. The relationship between critical thinking and self-esteem and academic achievement in the humanities and engineering students (Dissertation). Tehran: Tehran University; 2006. [Persian]

8. Noshadi N. Human sciences students' critical thinking dispositions: Provide a conceptual framework for developing students' critical thinking humanities. Strategies for Promoting the Humanities in the Country. 2007; 263-299. [Persian]

9. Gharib M, Rabieian M, Salsali M, Hadjizadeh E, Sabouri Kashani A, Khalkhali H. Critical thinking skills and critical thinking dispositions in freshmen and senior students of health care management. IJME. 2009; 9(2): 125-135. [Persian]

10. May BA, Edell V, Butell S, Doughty J, Langford C. Critical thinking and clinical competence: a study of

11. Wangensteen S, Johansson I. S, Björkström M. E, Nordström G. Critical thinking dispositions among

newly graduated nurses. Journal of Advanced Nursing. 2010; 66(10): 2170-2181.

12. Hajazi A, Borjaliloo S. Critical thinking: gender or field of study? Journal of Scientific and Research on Woman's Studies. 2008; 2(3): 14-28. [Persian]

13. Broadbear JT, Keyser BB. An approach to teaching for critical thinking in health education; The Journal of School health. 2000; 70(8): 322-326.

14. Tiwari A, Avery A, Lai P. Critical thinking dispos ition of Hong Kong Chinese and Australian nursing students. Journal of Advanced Nursing 2003; 44(3): 298-307.

15. Cisneros RM. Assessment of critical thinking in ph armacy students; American Journal of Pharmaceutical Education. 2009; 73(4): Article 66.

16. Profetto-McGrath GP. The relationship of critical thinking skills and and critical thinking disposition of baccalaureate nursing students; Journal of Advanced Nursing. 2003; 43(6): 569-577.

17. Azodi P, Jahanpoor F, Sharif F. Critical thinking skills of students in Bushehr University of Medical Sciences. Magazine of Elearning Distribution in Academy. 2010; 1(2): 10-16. [Persian]

18. Shafiei Sh, Khalili H, Mesgarafi H. Evaluation of critical thinking skills in nursing students of Zahedan Nursing and Midwifery Faculty. Journal of Teb va Tazkiyeh. 2004; 53: 20-24. [Persian]

19. Ranjbar H, Esmaili Habibollah. A study on the nu rsing and midwifery students' critical thinking disposition and its relation with their educational status. Journal of Urmia Nursing and Midwifery Faculty. 2006; 4(1): 11-17. [Persian]

20. Zarghi N. Comparsison of critical thinking between bachelor students nursing (Dissertation). Ghilan: Ghilan University Medical Sciences; 1995. [Persian]

21. Mirmolaei T, Shabani H, Babaei Gh, Abdehagh Z . Comparison of critical thinking among first and last trimester bachelor midwifery students. Hayat. 2004; 3(10): 69-78. [Persian]

22. Abdehag Z. Comparsison of critical thinking bet ween freshman and senior master of midwifery students [Dissertation]. Tehran: Tehran University of Medical Sciences; 2004. [Persian]

23. Baba Mohammadi H, Khalili H. Critical thinking skills of nursing students in Semnan University of Medical Sciences. IJME. 2004; 4 (2): 23-31. [Persian]

24. Hoseini A, Bahrami M. Comparison of critical thinking between freshman and senior bachelor students. IJME. 2002; 2 (2): 21-26. [Persian]

25. Amini M, Fazlinejad N. Critical thinking skills in Shiraz University of Medical Sciences students. Hormozghan Medical Journal. 2010; 14(3): 213-218. [Persian]