The Relationship Between Critical Thinking Skills and Conflict Management Styles in Nursing and Midwifery Faculty Members, University of Medical Sciences

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Abstract- Medical universities need faculty members (FMs) who use high-level thinking and the power of reason to make decisions in conflicting situations. The purpose of this study was to determine the relationship between critical thinking skills and conflict management styles in the Medical University FMs (MUFMs). A descriptive cross-sectional study using the stratified sampling and then Quota sampling was performed. The sample size was 160 people. The Thomas and Kilman's Questionnaire for Conflict Management Style and Critical Thinking Questionnaire Form B were used. This study showed that the total score of faculty members' critical thinking was lower than the expected mean. The participants have more deductive thinking skills. Other skills are descending respectively, including inductive thinking skills, evaluation, inference, and analysis. In the Conflict Management styles, the Compromising style scored the highest. And other styles are used in descending respectively, including; conflict management styles avoidance, competition, and collaboration. This study showed that the Compromising Conflict Management Style was the highest among the FMs and, in contrast to the Collaborating conflict management style, scored the lowest. The deductive Critical thinking skill scored the highest; in contrast, the analysis critical thinking skill was the least scored. This study showed that by increasing the total score of critical thinking skills of participants, the using of avoidance and compromising conflict management style is more likely.

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Introduction

Educational environments play an important role in providing services that all sectors of a community benefit from them (1). The existence of different people with different personality traits, needs, values, beliefs, expectations, and perceptions has inevitably caused conflict in organizations (2,3). Conflict is an inevitable phenomenon that is increasing in organizations day to day (3); consequently, conflict management is a topic that has been increasingly considered by organizations (4). on the other hand, the heart of each university is its Faculty Members (FMs) (5). This society of elites is responsible for the production of science and specialist training (6). The development of human resources will not be possible without considering the faculty members and without increasing their efficiency and, at the same time, maintaining and promoting their motivation, vitality, and innovation (7). Therefore, paying attention to the very sensitive mission of academic environments, it should be noted that the existence of any destructive conflict can disrupt the performance of this organization and achieve educational goals (1).

Medical university faculty members (MUFMs), like other people working in organizations, are confronted with conflicts. Given that FMs have the most important and effective role in the training of thoughtful and efficient human resources, they must have the best

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conflict resolution style to act as a suitable role model for learners. Conflict management requires strategies that are emotionally based on self-esteem, flexibility, scope, and openness of thinking and action in different ways (8). In fact, conflict management strategies are the same as responding to conflict situations, and these responses are likely to change in various ongoing situations (9). Although conflict cannot be prevented, it can certainly be managed. Although conflict cannot be prevented, it can certainly be managed.

Developing the right skills for effective difficult conversation management is really important (10).

Given conflict management is defined as the identification and analysis of conflicts in a reasonable and foreseeable situation fairly and effectively. When facing conflict, the first and most important step is to analyze the conflict event (11). On the other hand, the development of high-level thinking skills is one of the most important missions of higher education, and it requires the use of approaches that develop these thoughts (12). And the development of appropriate skills for effective management of difficult conversations is really important.

Experts believe that the skills needed to manage difficult conversations can be acquired (10). Today, more than ever, the benefits of critical thinking are discussed in different contexts (13). Critical thinking is a cognitive process in which one judges and decides to examine and analyze the available information and draw conclusions from them. In other words, cognitive thinking is a self-regulating and self-directed judgment process that solves problems and makes the right decisions for one person (14). Of course, critical thinking is not just about learning in higher education; it covers all life activities, including interpersonal relationships and jobs (15). In addition, some scholars believe that critical thinking embraces something beyond the aspects of intelligence, and individual performance and other factors such as emotional and personality traits influence it (16). Critical thinking is thought to be the key component of the medical professions in clinical education, education, and knowledge (17), And it is still vaguely and contradictory defined and applied in the profession (18). Moreover, the link between critical thinking and actual clinical or simulated performance is not clear (19).

A review of extant studies on the critical thinking of health care professionals shows that the critical thinking skills of nurses and nursing students are lower than the mean (20-25). The low score of these skills in nurses and nursing students emerges from two main causes. One of them is educational deficiencies in developing these skills (26). In the Study results of Momeni *et al.*, the need for the development of critical thinking skills of nursing students and adjustment to stressful situations in educational settings has been mentioned (27). It is also necessary to change the role of university centers as information reservoirs and instructors as information transmitters (28). Rahnama quotes Maroofi; "Critical thinking skills are educable as well as other thinking skills. Critical thinking education is the only training that facilitates the passage from the simplicity and unconditional acceptance of issues to deepening and freely choosing issues and enhances human ability to understand issues" (29). given the role that individuals' critical thinking level plays in decision making (26), Medical universities need FMs with high thinking levels and the power of reasoning, which can decide in conflicting situations. Because conflicts that are poorly managed and unresolved conflicts affect individuals, organizations, and, more importantly, the patient's outcomes (30).

Given Experts defined conflict competence as "the ability to develop and apply cognitive, behavioral, and emotional skills that enhance the fruitful outcome of a conflict while reducing the likelihood of injury" (10). the conflict management styles are complex, and however we may use only one style more than other styles, the style we use depends on the circumstances and the participants (31,32). The question arises, which kinds of conflict management styles (CMSs) are associated with the levels of critical thinking skills (CTSs) used by MUFMs. The purpose of this study was to determine the relationship between CTS and CMS in the FMs of the University of Medical Sciences.

Materials and Methods

A descriptive cross-sectional study that is under study population is all medical teachers/FMs by using stratified sampling and then Quota sampling. So that each school/faculty is considered as a stratum, then within each stratum, quota sampling was done. According to the following formula and based on similar studies and the consideration of r=0.35 and the probability of type 1 error is 5% and the probability of type 2 error is 10%, and the consideration of 100% increasing sample size (due to design effect), the sample size was estimated 160.

$$n = \left(\frac{z1 - \frac{a}{2} + z1 - \beta}{c} \right)^2 + 3$$

c= $\frac{1}{2}$**ln1+2/1-2**

The second researcher (M-S.M) referred to Faculty members. If they liked to participate in the study, after receiving written informed consent, a questionnaire was given to them. And the response rate was 100%.

The applied instrument in this study was a questionnaire containing three sections; a personal characteristics questionnaire, a questionnaire used for CMS Tomas and Kilman conflict instrument, and another applied instrument, California Critical Thinking Skills Test Form B.

1. Tomas and Kilman conflict instrument; this scale was designed by Thomas and Kidman to measure five CMSs; Competing, Collaborating, Compromising, Avoiding, and accommodating. This tool consists of 30 paired sentences as A and B, and the participant is required to select one sentence of two paired sentences a, or b, of each question, compatible with that is more in line with his or her spirits when to be confronted with conflicts. The obtained score in each section of the test varies from zero to 12. Each of them got a higher score than the others in each of the above domains, which means when to be confronted with conflict, that style is used more (33). We scored each section as follows; the competing score between 0-2(low), 3-6(middle), and 7-12(high). The collaborating score between 0-4(low), 5-8(middle), and 9-12(high). The compromising score is between 0-5(low), 6-9(middle), and 10-12(high). The avoiding score between 0-4(low), 5-7(middle), and 8-12(high). The accommodating score between 0-3(low), 4-6(middle), and 7-12(high).

2. California Critical Thinking Skills Test Form B. This test consists of 34 multiple-choice questions with a correct answer for critical thinking skills assessment in the five subscales of analysis, inference, evaluation, Deductive Reasoning, and Inductive Reasoning. The obtained score in each section of the test varies between zero and 16. The maximum scores in five sections, respectively, including the Analysis section, is 9, the inference is 11, deductive reasoning is 16, Inductive Reasoning is 14, and evaluation is 14. Thus, the Overall Reasoning score of critical thinking varies between 0-34 (34).

The range of questions involves cases that measure semantic analysis from one sentence to a more complex combination of critical thinking skills. Answering some of the questions in this questionnaire requires extracting the correct inference from a series of assumptions, evaluation, and the reasoned justification of a conclusion. Answering a different category of questions involves protesting the provided inferences and justifying and evaluating these objections (35).

Given the very use of these two questionnaires in Iran and the availability of both questionnaires, these accurate questionnaires were used to measure both the main variables in this research. In Esmaeilkhani's study, the reliability of this scale was used in two methods: Cronbach's Alpha, Split-half, and test-retest methods, and presented the results as follows: the reliability coefficients obtained from the Cronbach's alpha method were from 32% to 72% and Split-half method, it also fluctuates from 39% to 72% Also, the obtained coefficients were significant (P<0.05) with re-test method (36).

California Critical Thinking Questionnaire Form B: This tool is currently the most scientific and practical instrument for measuring critical thinking skills in nursing; its widespread use in critical nursing research is evidence of this claim. The reliability of this is based on internal correlation using Kuder-Richardson Formula 20. between 68-71%, which is appropriate for measuring the power of an individual's thinking (37). The results of Khalili and Hosseinzadeh and Davoodi and Naghsh Poor's studies indicated that the test questions have the necessary trust as a research tool and they are consistent with the theoretical structure of the test, and they all measure one construct (critical thinking) and have a good distinction power among people with different levels of critical thinking (CT) (38,39).

Khodamoradi *et al.*, also carried out the translation and psychometric testing of the California Critical Thinking Questionnaire Form B and found follow as; the overall internal correlation coefficient (86%) and the internal correlation of the subtests as analysis (71%), evaluation (77%), inference (71%), inductive reasoning (77%), and deductive reasoning (71%), that is suggesting a significant relationship between the subtests with together and with the overall Reasoning in order to measure the critical thinking construct. Therefore, it seems that this test is more comprehensive than other tests in assessing critical thinking (40).

Finally, after completing the questionnaires, the score of FMs' CMSs and their CTSs, as well as information about demographic characteristics, were calculated. As the normality test (Kolmogorov-Smirnov) revealed the normal distribution of all data, parametric tests were applied. For data analysis, descriptive statistics indices, including frequency tables and central indexes, and dispersion were used to describe the data. Independent sample T-test was used to assess the relationships between some independent categorical variables (gender, marital status, participation in a critical thinking class,

and participate in conflict management class) and the mean of CMSs, CMSs subgroup scores, and the total score of CTSs. The relationships of other independent categorical variables (educational level, Employment status) with the mean of CTSs, CMSs subgroup, and the total score of CTSs were evaluated using the Analysis of Variance (ANOVA). Pearson's correlation analysis was performed to investigate the relationships between quantitative variables. All analyzes were performed using statistical software SPSS 16, and the significance level for all tests was 0.05.

Ethical considerations

Data collection was conducted after the project was approved by the research ethics committee (Ethics code: IR.LUMS.REC.1397.192). Then written informed consent from the participants was obtained. Additionally, participants were informed of the objectives and methods of the study, their rights, anonymity, confidentiality of information, and the unconditional right to withdraw from the study.

Due to the 100% response rate, there was no restriction on the research. The only limitation of this study was conducted at a university center.

Results

In this study, 160 FMs of the Lorestan University of Medical Sciences were understudied. The demographic status of the participants is shown in Table 1. The mean and standard deviation of the CMSs scores are shown in Table 2. Based on this table, the mean score of Accommodating CMS was 6.45±1.91; the Avoiding CMS was 7.22±1.90, the Compromising CMS was 8.21±1.37, the Collaborating CMS was 3.87±1.77 and competing CMS was 4.55±2.17. The Compromising CMS scored the highest use. And other styles are used in descending order; avoiding, accommodating, Competing, and Collaborating CMSs.

The average total score of CTSs in the samples was 13.19±3.54. The mean score of CTSs for the domains follow; analysis: 3.50±1.46, the evaluation: 5.04±1.77, Inference: 4.03±1.77, Inductive Reasoning: 5.37±2.06 and Deductive Reasoning: 5.96±1.96. In table 2, the mean and standard deviation of the CTSs scores have been shown. The Deductive Reasoning skill scored the highest critical thinking skills. Other skills are descending respectively as follows: inductive thinking skills, evaluation, inferential, and analysis.

Table 1. The participants' demographic characteristics

	Level	Number/percent
Age	Mean±SD	7.22±44.38
Gender	male	58(36.3%)
	female	102(63.8%)
Marital status	married	129(80.6%)
	unmarried	31(19.4%)
Educational level	MSc	19(11.9%)
	Ph.D.	78(48.8%)
	specialist	63(39.4%)
Employment status	Official hiring	78(48.8%)
	unofficial hiring	68(42.5%)
	hiring as a service commitment	14(8.8%)
Work experience	Mean ±SD	8.82±13.84
Management experience	Mean ±SD	6.22±4.49
Participate in a critical thinking class	Pos.	18(11.3%)
	Neg.	142(88.8%)
Participate in conflict management class	Pos.	8(5%)
	Neg.	152(95%)
Schools	Pharmacy	7(4.4%)
	Allied medical science	9(5.6%)
	Dentistry	14(8.8%)
	Health	19(11.9%)
	Nursing and Midwifery	28(17.5%)
	Medicine	83(51.9%)

Table 2. Given scores of Critical Thinking Skills and Conflict Management styles separately

Critical thinking skills		Conflict management styles	
Subscales	**Mean±SD**	**Subscales**	**Mean±SD**
Analysis	3.50±1.46	Competing	4.55±2.17
Evaluation	5.04±1.77	Collaborating	3.87±1.77
Inference	4.03±1.77	Compromising	8.21±1.37
Deductive Reasoning	5.96±1.96	Avoiding	7.22± 1.90
Inductive Reasoning	5.37±2.06	Accommodating	6.45±1.91
Overall Reasoning	13.19±3.54	-	-

Table 3. Correlation between critical thinking skills and conflict management styles

			Critical thinking skills					Conflict management styles				
			Analysis	Evaluation	Inference	Inductive Reasoning	Deductive Reasoning	Accommodating	Avoiding	Compromising	Collaborating	Competing
Critical thinking skills	Analysis	Correlation	1	-.204**	.087	.305**	.122	-.204**	.139	.228**	.024	-.082
		P		.010	.275	.000	.124	.010	.080	.004	.758	.304
	Evaluation	Correlation	.047	1	.549**	.494**	.813**	.009	.260**	.130	-.088	-.173*
		P	.556		.000	.000	.000	.911	.001	.100	.268	.028
	Inference	Correlation	.087	.549**	1	.795**	.547**	.067	.144	.097	.069	-.272**
		P	.275	.000		.000	.000	.400	.069	.220	.383	.001
	Inductive Reasoning	Correlation	.305**	.494**	.795**	1	.279**	.094	.149	.085	.109	-.306**
		P	.000	.000	.000		.000	.239	.060	.285	.169	.000
	Deductive Reasoning	Correlation	.122	.813**	.547**	.279**	1	-.069	.263**	.138	-.131	-.124
		P	.124	.000	.000	.000		.387	.001	.081	.098	.118
Conflict management styles	Accommodating	Correlation	-.204**	.009	.067	.094	-.069	1	-.201*	-.321**	-.072	-.483**
		P	.010	.911	.400	.239	.387		.011	.000	.365	.000
	Avoiding	Correlation	.139	.260**	.144	.149	.263**	-.201*	1	-.119	-.345**	-.279**
		P	.080	.001	.069	.060	.001	.011		.133	.000	.000
	Compromising	Correlation	.228**	.130	.097	.085	.138	-.321**	-.119	1	-.149	-.071
		P	.004	.100	.220	.285	.081	.000	.133		.059	.373
	Collaborating	Correlation	.024	-.088	.069	.109	-.131	-.072	-.345**	-.149	1	-.330**
		P	.758	.268	.383	.169	.098	.365	.000	.059		.000
	Competing	Correlation	-.082	-.173*	-.272**	-.306**	-.124	-.483**	-.279**	-.071	-.330**	1
		P	.304	.028	.001	.000	.118	.000	.000	.373	.000	

.**Correlation is significant at the 0.01 level (2-tailed).

.*Correlation is significant at the 0.05 level (2-tailed)

Table 4. Correlation between Total score of Critical thinking skills and Conflict management styles

		Total score of Critical thinking skills	Avoiding	Competing	Compromising	Collaborating	Accommodating
Total score of Critical thinking skills	Pearson Correlation	1	.270**	-.243**	.210**	-.004	-.065
	Sig. (2-tailed)		.001	.002	.008	.959	.416
Avoiding	Pearson Correlation	.270**	1	-.279**	-.119	-.345**	-.201*
	Sig. (2-tailed)	.001		.000	.133	.000	.011
Competing	Pearson Correlation	-.243**	-.279**	1	-.071	-.330**	-.483**
	Sig. (2-tailed)	.002	.000		.373	.000	.000
Compromising	Pearson Correlation	.210**	-.119	-.071	1	-.149	-.321**
	Sig. (2-tailed)	.008	.133	.373		.059	.000
Collaborating	Pearson Correlation	-.004	-.345**	-.330**	-.149	1	-.072
	Sig. (2-tailed)	.959	.000	.000	.059		.365
Accommodating	Pearson Correlation	-.065	-.201*	-.483**	-.321**	-.072	1
	Sig. (2-tailed)	.416	.011	.000	.000	.365	

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

Discussion

This study showed the relationship between critical thinking skills and conflict management styles of MUFMs.

This study showed MUFMs had the most frequently used compromising CMS, then use the avoiding, accommodating, Competing, and Collaborating CMSs descending respectively. The findings of the study by Hasanpour *et al*., consistent with this finding, showed that

nurses are more likely to use compromising CMS in confronting the conflict then they use accommodating and collaborating, respectively (41). In contrast, Chan *et al.,* study and Kantek *et al*., study showed that nursing students used mostly collaborating and accommodating CMSs in the clinical environment, and the use of competing for CMS was used the least (42,43). These differences were due to the difference in the nature of clinical nurses' environment in comparison with MUFMs. Also, Rambuyon and Domondon's study showed that the most dominant conflict management style used is collaborating, and other the applied CMS were accommodating, competing styles, avoiding, and compromising CMS descending respectively (10). Because clinical nurses need to have more collaboration in doing their duties, they use mostly these styles. A compromising CMS means that a person prefers to retreat from a part of his/her benefits and, through a cooperative manner, by Giving points to their counterpart, his/her own interests are achieved. The MUFMs are more likely to use compromise, avoidance, and accommodating styles; this is probably due to their independence in doing their duties, which hinders synergy and creativity in the workplace. Other studies showed that nursing managers to manage conflict, use mostly collaborative CMS then use compromising CMS (30,44,45), which is not consistent with the present study; it may be due to different conditions and participants.

The present study showed that MUFMs had mostly deductive thinking skills and then had inductive thinking, and the least CTSs were in the analysis domain. Any study on this subject was not found in FMs, but These findings can be cited; Hasanpour *et al*., showed the highest and the least mean scores of critical thinking skills in clinical nurses were the deductive reasoning and analysis skills domains, respectively (41). In contrast, Fero *et al*., Showed that the highest and the least critical thinking skills in students were inductive reasoning and analysis domains, respectively (19).

Also, the present study showed the mean score of critical thinking skills in MUFMs was 13.19±3.54, which is below the median of the total score of the critical thinking instrument. Hasanpour *et al*., And Baba Mohammadi *et al*., showed that the mean score of CTSs of nurses and nursing students was less than the median of the total score of CTSs instrument(35,41). As mentioned, several studies have shown a low overall score of CTS in nursing students and nurses (20-25). But we didn't find any study about CTS in MUFMs.

The present study showed two correlations between the sections of CTS, as follows; 1. the maximum correlation was between deductive thinking skills and evaluation thinking skills. It means increasing the skill of deductive thinking skills, the use of evaluation thinking skills increases, and vice versa. Deductive reasoning moves with exacting precision from the assumed truth of a set of beliefs to a conclusion that cannot be false if those beliefs are true. Applying evaluation skills, we can judge the quality of analyses, interpretations, explanations, inferences, options, opinions, beliefs, ideas, proposals, and decisions. Strong explanation skills can support high-quality evaluation by providing the evidence, reasons, methods, criteria, or assumptions behind the claims made and the conclusions reached (46).

2. there was a high correlation between inference thinking skill and inductive thinking. It means by increasing one of them, another increase. We didn't find any study results about it. It's better we explain each of these domains:

Inference skills enable us to draw conclusions from reasons and evidence. We use inference when we offer thoughtful suggestions and hypotheses. We use inductive reasoning skills when we draw inferences about what we think must probably be true based on analogies, case studies, prior experience, statistical analyses, simulations, hypotheticals, and familiar circumstances and patterns of behavior (46).

The assessment of the relation between the total score of CTSs and CMSs showed amongst the five domains of CMSs; there was a significant relationship between avoidance and compromising CMS and the total score of CTSs. It means by increasing the total score of critical thinking skills of participants, the using of avoidance and compromising conflict management style is more likely. In contrast, Hasanpour *et al*., showed that there is a statistically significant and direct relationship between the total score of CTS with the accommodating CMS (41).

This study indicated that there was a statistically significant reverse relationship between inductive thinking skills and competing conflict management style, which means by increasing the inductive reasoning skill, the use of competing CMS is reduced, and vice versa. Hasanpour showed there is a statistically significant and direct relation between the inductive reasoning CTS with collaborating CMS (41), which is not consistent with the present study.

The present study showed a reverse relationship between analysis and accommodating style and between inference and competing style. In contrast, Hasanpour showed there is a statistically significant and direct relation between there is the analysis and accommodating

style. Moreover, her study showed there is no relation between inference and competing style.

The present study showed there was a direct correlation between deductive thinking skill and avoidance CMS, which was significant according to the Pearson test, which means by increasing the skill of deductive reasoning, the use of avoidance CMS increases, and vice versa. While Hasanpour *et al*., showed that there is a reverse and weak relation among evaluation, inference, inductive reasoning, deductive reasoning domains, and the total score of CTSs with avoiding CMS. It means the greater the critical thinking skills in these domains or the total score of CTSs, the use of avoiding CMS will be reduced (41). This is not consistent with the present study in terms of the relationship between inductive/deductive reasoning and avoiding CMS.

In the present study, there was a direct and significant correlation between compromising CMS and analysis CTS. It means by increasing the analysis CTS, the use of compromise CMS increases and vice versa. In addition, there was a reverse statistically significant relationship between competing CMSs and the total score of CTSs. These results didn't find in other similar studies.

In the present study, there was a direct and significant correlation between the inference thinking skills and the compromising CMS (P=0.031). Hasanpour *et al*., showed that there is a significant and direct relation between inference, deductive reasoning, critical thinking skills, and the total score of critical thinking skills with compromising conflict management style (41), which isn't consistent with the present study.

This study showed that MUFMs use mostly the compromising conflict management style; in contrast, the use of the collaborating conflict management style is at least. But using a compromising conflict management style worsens the workplace situation and prevents the creation of a flourishing and creative environment. If conflicts are constructive, they create new and creative thoughts and provide ground for change and innovation and constructive change in the organization; ultimately, they help managers who want to achieve their organizational goals.

In addition, in the present study, there was the highest degree of deductive-critical thinking skills, and the least-mean analysis was considered. Which unfortunately represents less use of innovative approaches. This study showed that the total score of medical teachers' critical thinking was lower than the expected average. Due to the fact that CTS and the application of conflict management style depend on the workplace conditions and the participants, there are other differences between CTSs and CMS in other studies. Considering the increasing conflict in academic work environments and the need to develop CTS in teachers and subsequently increase the critical thinking skills of students, we recommend more research in this field and in other universities.

Given the important role of faculty members in educating students and future health staff, conflict can have a detrimental effect on their performance. These elites of society must be empowered in conflict management and critical thinking. Managers should be aware and address this topic and the conflict is inevitable. A successful academic leader, such as a chair or group leader, must be able to effectively diagnose and manage conflicts. They should create a learning and innovative organizational environment and try to cultivate critical thinking and suitable conflict management skills.

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