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# Effect of professional ethics on reducing medical errors from the viewpoint of faculty members in the medical school of Tabriz University of Medical Sciences

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## Abstract

**Background:** Professionalism and adherence to ethics and professional standards are among the most important topics in medical ethics that can play a role in reducing medical errors. This paper examines and evaluates the effect of professional ethics on reducing medical errors from the viewpoint of faculty members in the medical school of the Tabriz University of Medical Sciences.

**Methods:** in this cross-sectional descriptive study, faculty members of the Tabriz University of Medical Sciences were the statistical population from whom 105 participants were randomly selected through simple random sampling. A questionnaire was used, to examine and compare the self-assessed opinions of faculty members in the internal, surgical, pediatric, gynecological, and psychiatric departments. The questionnaires were completed by a self-assessment method and the collected data was analyzed using SPSS 21.

**Results:** Based on physicians' opinions, professional ethical considerations and its three domains and aspects have a significant role in reducing medical errors and crimes. The mean scores (standard deviations) of the managerial, knowledge and communication skills and environmental variables were respectively 46.7 (5.64), 64.6 (8.14) and 16.2 (2.97) from the physicians' viewpoints. The significant factors with highest scores on the reduction of medical errors and crimes in all three domains were as follows: in the managerial skills variable, trust, physician's sense of responsibility against the patient and his/her respect for patients' rights; in the knowledge and communication skills domain, general competence and eligibility as a physician and examination and diagnosis skills; and, last, in the environmental domain, the sufficiency of trainings in ethical issues during education and their satisfaction with basic needs.

**Conclusion:** Based on the findings of this research, attention to the improvement of communication, management and environment skills should be a main focus of programs in the teaching of professional ethics in universities.

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## Introduction

One of the important issues that can be examined from different angles is the ethical responsibility of medical professionals, because these professionals are directly in touch with the health of the human body and soul. Therefore, the slightest mistake can sometimes cause irreparable damage. Medical errors, legal defense of the client and dealing with complaints are among the concerns of the medical community, and knowledge about its

prevalence and causes can be effective in preventing errors and promoting community health and in ensuring the mutual rights of medical professionals and their clients.<sup>1</sup>

Medical errors can be found in any diagnostic, therapeutic, educational, and research activity in the field of medical science. Activities that are not to be carried out by medical practitioners, their refusal to carry out the activities that are required, lack of adequate skills, and the disregard of the formal and legal standards governing the medical

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profession and its affiliated professions can put diagnostic, treatment and research activities at risk.<sup>2,3</sup>

Italian hospitals currently pay more than 10 billion euros to patients annually to compensate for damage caused by medical injuries and medical errors. Available statistics in the United States has estimated that death due to medical errors is the third leading cause of death.<sup>4</sup> Each year, the number of people who die as a result of medical errors is more than those dying in car accident.<sup>5</sup> Preventable deaths are estimated to range from 44 000 to 200 000 in United States hospitals<sup>6</sup> and more than one million injuries occur annually.<sup>7,8</sup>

Solberg et al reported in 2008 that nearly 98 000 deaths occur due to medical errors in hospitals and health care institutions.<sup>9</sup> Similar statistics in this area indicate the high incidence of medical errors in other countries.<sup>10,11</sup> In Iran, patient complaints are increasing and medical error is one of the main reasons. It has also been reported in various studies that medical negligence has even led to death.<sup>12</sup> The highest rate of error is 53%, related to the medical staff, which has caused 22% to 44% deaths, 35% side effects, 27% physical injuries and 20% material damage.<sup>4</sup> If medical errors and negligence persist, they will be accompanied by complications such as mortality, infections, various types of disabilities and other physical injuries, and will incur high costs for compensating these errors and if medical staff are not educated about the errors they committed, it will bring about the continuation of the wrong process of work, which leads to waste of time, money and manpower.<sup>13</sup>

Therefore, the subject of medical error is of universal and cost-effective interest, imposing a high financial, psychological and physical burden on patients, families and society, causing injury and even death.<sup>14</sup> According to studies, emergency physicians are at the forefront of medical complaints, most of which are due to errors in medical diagnosis, which leads to a high financial burden.<sup>15</sup> In addition to the negligence of medical professionals, other instances of professional misconduct include violations of clients' rights in the areas of care and treatment, education, research, lack of consideration of legal, ethical and professional standards, and an excessive use of unnecessary health services that brought the attention of policy makers in the health system reform.<sup>14</sup>

In spite of studies on medical ethics, including the Patients' Rights Charter in Iran and ethical codes of research in medical sciences,<sup>16</sup> medical ethics issues are new in Iran. Furthermore, any professional misconduct in the areas of ethical, legal and service areas may lead to serious, irreparable physical, psychological, social and economic damages for the patient, his family, society and the health system. Therefore, it is necessary to determine the factors associated with negligence and medical errors from the point of view of the main group of this issue or the physicians themselves. Therefore, the present study examined the role of professional ethics in reducing

medical crimes and errors from the viewpoint of clinical faculty members in the medical school of the Tabriz University of Medical Sciences.

### **Materials and Methods**

The current study was a cross-sectional survey. The statistical population was the faculty members of the Tabriz University of Medical Sciences in the academic year 2016-2017 teaching as assistant, associate or full professors in the faculty of medicine. The obtained sample size was 105 people using Cochran's formula with a 95% CI and after using Yates' correction. The sample was selected by random sampling and analyzed. Finally, five questionnaires were excluded due to defects and 100 questionnaires were analyzed.

Including criteria include at least one year of job experience in the current ward. In this study, the research environment included hospitals affiliated to Tabriz University of Medical Sciences.

### **Introducing the measurement tool**

The data-gathering tool was a questionnaire. For this purpose, the questionnaire included two parts: demographic and professional ethics that covered three areas: management, environment, individual care. This researcher-made tool was used based on previous studies.<sup>14,17</sup> Demographic data included variables such as age, sex, organizational status, and job experience. The professional ethics section on reducing medical errors included 30 questions (11 questions related to management skills, 15 questions related to knowledge and communication skills, and 4 questions related to the environment area). Questions were designed based on a 5-point Likert scale, where choosing one of two positive options ("completely agrees" or "agrees") indicated the suggested item was effective as one of the criteria for professional ethics in reducing medical negligence. Choosing one of two negative options ("completely disagree" or "disagree") indicates that the item proposed is not effective in reducing these errors from the viewpoint of clinical faculty members. The neutral option ("no idea") suggests a lack of knowledge about the effect of the item on the reduction of medical negligence. The data collection was done in such a way that after expressing the purpose of the research to the participants, the researcher provided them with a questionnaire if they wished, and ensured the research units that all information was kept confidential and there was no need to mention their first name and surname.

### **Determining the validity and reliability of the measuring instrument**

To determine its validity through content validity, a questionnaire was provided to 10 faculty members and PhD students of Tabriz University of Medical Sciences to comment on the appropriateness of the questions

and based on which necessary changes were made. To determine the reliability, an internal correlation test of Cronbach's alpha was used. The alpha value in the domain of management skills was 0.83, knowledge and communication skills 0.91 and environmental factors 0.75; and the total questionnaire was calculated at 0.93. These scores indicated that the domains are measuring their intended purpose; a score of 0.70 or higher is judged to be acceptable in statistical survey usage.

### Data analysis

Data were analyzed using SPSS 21. To answer the descriptive questions, descriptive statistics (frequency, proportion, percentage, mean and standard deviation) were used and a one sample *t* test was used for hypothesis testing after assuring the normal distribution of variables using the Kolmogorov-Smirnov test. In all analyzes, *P* <0.05 was considered significant.

### Results

In this study, of 105 questionnaires distributed among faculty members, 100 questionnaires were completed and returned to the researcher. Data analysis was performed on the same number (100 clinical faculty members).

Table 1 shows 10 items in the management skills areas that had an average of 4 and higher. Considering the maximum average (5), the clinical faculty members emphasized this theory and reliability, trust and responsibility of the physician against the patient 4.69 (0.54) and respecting the patient's rights 4.63 (0.61) in the area of management were among the preventative factors in reducing medical negligence and errors.

Table 2 shows that in the area of knowledge and communication skills, there are 14 items that had an average of 4 and above. Regarding the maximum average (5), it was found that clinical faculty members emphasized this theory and the overall competence as a physician 4.57 (0.68) and diagnostic skills 4.55 (0.80),

examination skills 4.55 (0.75) and skills and abilities in the correct administration of the treatment 4.44 (0.75) were the items that obtained the highest mean in the area of communication skill and knowledge.

Also, as shown in Table 3, the results indicated that the participants mean score regarding the environmental and contextual variable was 4 and above. In other words, participants responded that they were adequately trained and educated about ethical issues at the university ( $4.26 \pm 0.86$ ) and they were satisfied with the salary, basic needs and the resting time provided for them ( $4.24 \pm 0.95$ ). Indeed, these factors were the most significant factors according to the participants' views with regard to the environmental variable.

### Dispersion of the faculty members' views about the impact of professional ethics and its variables on reducing medical errors and negligence

As shown in Table 4, the mean response of faculty members regarding the effect of professional ethics on reducing medical errors was higher than average. Also, as indicated by the Kolmogorov-Smirnov test, the collected data was normally distributed since the *P* value was higher than 0.05. Hence, one-sample *t* test was used for testing the hypotheses.

### Professional ethics and its variables in reducing medical negligence and crimes

Based on the result of one-sample *t* test and the information given in Table 5, the average of calculated index regarding the role of professional ethics and its variables was significant (*P* <0.05 with 95% non-chance value which was greater than *t* is critical). Consequently, it can be considered that ethical considerations and professional codes and the above-mentioned three variables have a significant impact on reducing and preventing medical crimes and negligence.

**Table 1.** Frequency distribution of management skills in reducing medical negligence

Item	Fully agree/ agree	No idea	Fully disagree/ disagree	Mean (SD)
	No. (%)	No. (%)	No. (%)	
Compassion and sympathy with the patient	86 (86)	6 (6)	8 (8)	4.25 (0.98)
Reliability, trust and sense of responsibility of physician against patient	98 (98)	1 (1)	1 (1)	4.69 (0.54)
Leadership skills of physician	87 (87)	8 (8)	5 (5)	4.22 (0.83)
Creativity and innovation in providing treatment to various patients	77 (77)	19 (19)	4 (4)	4.13 (0.89)
Organizational and managerial skills in different situations	74 (74)	21 (21)	5 (5)	4.09 (0.99)
Respecting patient's rights	95 (95)	4 (4)	1 (1)	4.63 (0.61)
Self-confidence	78 (78)	14 (14)	8 (8)	4.04 (0.96)
Speed and readiness in different treatment situations	91 (91)	6 (6)	3 (3)	4.41 (0.77)
Collaborating with colleagues in diagnosing and treating patients	93 (93)	5 (5)	2 (2)	4.42 (0.72)
Collaborating with patients	64 (64)	32 (32)	4 (4)	3.79 (0.9)
Active participation in holding meetings and conferences related to their specialty	79 (79)	16 (16)	5 (5)	4.06 (0.82)

**Table 2.** Frequency distribution in the area of knowledge and communication skills in reducing medical negligence and errors

Item	Fully agree/agree	No idea	Fully disagree/ Disagree	Mean (SD)
	No. (%)	No. (%)	No. (%)	
Overall competence as a physician	91 (91)	8 (8)	1 (1)	4.57 (0.68)
Clinical judgment or clinical decision making	86 (86)	12 (12)	2 (2)	4.63 (0.77)
Application of medical information in the field of diagnosis and treatment	91 (91)	6 (6)	3 (3)	4.44 (0.78)
Examination Skills	92 (92)	4 (4)	4 (4)	4.55 (0.75)
Diagnostic skills	91 (91)	5 (5)	4 (4)	4.55 (0.8)
Providing document to prove diagnosis	84 (84)	12 (12)	4 (4)	4.32 (0.83)
Training the patient and his family	84 (84)	12 (12)	4 (4)	4.26 (0.89)
Participating in and monitoring all aspects of treatment	90 (90)	8 (8)	2 (2)	4.40 (0.72)
Appropriate relationship with non-medical staff	71 (71)	23 (23)	6 (6)	3.92 (0.92)
Appropriate relationship with patients and their families	80 (80)	14 (14)	6 (6)	4.08 (0.84)
Interpersonal and social skills	73 (73)	26 (26)	1 (1)	4.05 (0.83)
Clear communication with the patient	81 (81)	17 (17)	2 (2)	4.13 (0.76)
Following patient treatment process	91 (91)	7 (7)	2 (2)	4.39 (0.75)
Open to criticism	81 (81)	18 (18)	1 (1)	4.20 (0.8)
Ability and skill in correct treatment and prescription	89 (89)	10 (10)	1 (1)	4.44 (0.75)

**Table 3.** Frequency distribution on the role of knowledge and communication skills in reducing medical negligence and errors

Item	Completely agree/agree	No idea	Completely disagree/ disagree	Mean (SD)
	No. (%)	No. (%)	No. (%)	
Adequacy of trainings on ethical issues at the universities	82 (82)	15 (15)	3 (3)	4.26 (0.86)
Satisfaction with basic facilities and salary and the amount of rest	81 (81)	12 (12)	7 (7)	4.24 (0.95)
Biological changes of body at the night shift	73 (73)	19 (19)	8 (8)	4.02 (1.01)
Non-punitive response to errors	56 (56)	29 (29)	15 (15)	3.65 (1.09)

**Table 4.** Results of Kolmogorov-Smirnov test for the distribution of variables

Variables	Frequency	Mean	SD	Kolmogorov-Smirnov	P value
Managerial skills	100	46.73	5.64	1.24	0.09
Knowledge and communicative skills	100	64.66	8.14	1.06	0.21
Environmental factors	100	16.17	2.97	1.70	0.05
Professional ethics	100	127.5	14.68	0.94	0.33

## Discussion

Based on the faculty members' views, it was found that the managerial skills variable was one of the significant variables with regard to observing professional ethics in reducing medical crimes and negligence. Regarding this variable, the highest scores were related to the reliability, trust, sense of responsibility and respect for the patients' rights items. Maarefi et al<sup>18</sup> found that the highest mean score was related to respect for patients. In fact, the findings of the present study are consistent with those of Maarefi et al.<sup>18</sup> Also, Jafari Manesh et al<sup>19</sup> argued that conflict management principles, respect for the colleagues within the same treatment team, commitment to justice and care were, respectively, the most significant criteria observed by

the medical team, similar to the results of the present study. However, Bazrafkan reported that university students complained about physicians' improper communications with patients and disrespect towards patients, and the majority considered disrespecting the others, especially patients, by faculty members as characteristic of negative patterns.<sup>17</sup>

Furthermore, the results of the present study with respect to the environmental variable indicated that factors such as the adequacy of trainings during education and their satisfaction with basic needs such as salary and rest can be influential in reducing medical crimes and errors. Dehgani et al indicated that the environmental area was the most important obstacle in professional ethics.<sup>20</sup>

**Table 5.** Results of one-sample t-test regarding the role of professional ethics and its variables on reducing medical errors and negligence

Variables	Frequency	df	Mean	SD	T value	P value
Managerial skills	100	99	46.73	5.64	34.03	0.000
Knowledge and communicative skills	100	99	64.66	8.14	36.43	0.000
Environmental factors	100	99	16.17	2.97	20.74	0.000
Professional ethics	100	99	127.56	14.68	35.79	0.000

In another study conducted in 2013 by Dehghani and Mohammad Khan Kermanshahi, they concluded that there was a strong positive correlation between work shift and quality of professional ethics. The rest factor can improve the consideration of professional ethics standards.<sup>21</sup> Furthermore, Canadian researchers argued that long working hours of medical teams was considered an effective factor in the promulgation of working errors and not considering professional ethics by physicians,<sup>22</sup> which is consistent with the findings of the present study. Regarding the present study and previous studies, it can be argued that the achievements of considering professional ethics are as follows: minimization of risk for employees and patients, timely and impartial identification of important events and their reasons, paying attention to complaints, using the best available evidence for clinical decision-making, and self-assessment of performance and the results of clinical interventions. Considering the importance of ethical considerations and professional standards, from the viewpoint of faculty members of Tabriz School of Medicine and the results obtained in this study, faculty members across different medical groups such as gynecology, pediatrics, surgery, psychiatry, dentistry, etc, evaluated the positive impact of behaviors related to professional ethics in reducing medical negligence. According to the present study, the primacy of capabilities such as reliability, trust and sense of responsibility for the patients, respect for patients' rights, leadership skills, cooperation and collaboration with colleagues showed that faculty members considered these factors important in preventing major medical negligence.

The present study has some limitations. It was conducted only through self-evaluation; other evaluation tools such as peer, student, resident and even patient reviews could make this study more complete. Further research is needed in this regard to test the feasibility of these findings for use in other universities and to assess the relationship between professional ethics and the reduction of medical errors and negligence. Factors related to reducing medical errors can also be examined in qualitative studies. Furthermore, there is a need for designing, developing and standardizing large-scale measurement tools for examining the impact of professional ethics in reducing medical errors.

### Conclusion

The results of the present study indicate that physicians who consider professional ethical standards make fewer errors and they experience less medical negligence.

Finally, it is recommended that medical professors who fully consider professional ethics be interviewed. Their behavior can be benchmarks for younger faculty members and physicians. Moreover, professional ethics should be systematically taught to students through mass media so that ethical principles are institutionalized in all affairs, especially medicine. Eventually, it is recommended that financial and spiritual advantages be considered for medical professors who are more committed to ethics. Hence the overall responsibility of the university for training young faculty members, especially in the field of professional ethics, will be twofold, and teaching ethics at universities should be emphasized in core curricula because management and leadership are the basis for realizing professional traits in society.

### Ethical approval

Informed consent was obtained from the faculty members.

### Competing interests

The authors declare that there is no conflict of interest.

### Authors' Contributions

FDM designed the study. FDM and JS collected and analyzed the data and contributed to drafting the manuscript.

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