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Effectiveness of the course of medical ethics for undergraduate medical students

Fariba Asghari[1*], Aniseh Samadi[2], Taraneh Dormohammadi[3]

1.Assistant Professor, Medical Ethics and History of Medicine Research Center, Tehran University of Medical Sciences, Tehran, Iran.
2.Researcher, Medical Ethics and History of Medicine Research Center, Tehran University of Medical Sciences, Tehran, Iran.
3.Assistant Professor, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran.

[*]***Corresponding author:*** Fariba Asghari
Address: No.21, 16 Azar Ave., Keshavarz Blvd., Medical Ethics and History of Medicine Research Center, Tehran, Iran.
Tel: (+98) 21 66 41 96 61
E-mail: fasghari@tums.ac.ir

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Abstract

Judgment This study was done in order to evaluate the effectiveness of the revisions made in the course of medical ethics for undergraduate medical students.
Medical Students of Tehran University of Medical Sciences who took the course of medical ethics in a semester before the implementation of the revision and those who took the course after the implementation of the revision at the beginning and at the end of course responded to two questionnaires (one for evaluating knowledge and the other for assessing their moral judgment). Response rate was between 70 to 93.1 percent.
Students' knowledge was significantly higher in the semester after the course revision (mean ± SD: 6.12 ± 1.3) in comparison with the semester before the reform (mean ± SD: 3.63 ± 1.7) (P=0.001). Students' knowledge after taking this course showed an increase of about 60% when compared with their knowledge level before starting the course (P=0.001). There was no significant difference in the level of moral judgment before and after taking the revised course of medical ethics while moral judgment level of students in two semesters [before (21.21± 4.0) and after 15.25 ± 2.87) reform] were significantly different (P=0.02).
The revisions made in the course of medical ethics for medical students were effective in improving students' knowledge but could not improve their moral judgment. This could be due to the short length of this course and also the small sample size in this study. We suggest that this study should be repeated with larger sample size and also with other methods of a course evaluation.

Keywords: *Medical ethics, Ethics education, Moral judgment test.*

Introduction

Physicians encounter many different types of ethical dilemmas in their daily practice. Problem-based learning is expected to be helpful in providing competency for solving these ethical problems (1) which results in improvement of patient's care and patient's satisfaction (2). Medical ethics is a mandatory course in undergraduate medical education in Iran but a few studies have been designed to evaluate its efficacy.

Strengths and weaknesses of a course of ethics could not be determined just through the assessment of students' knowledge. Their attitude and moral judgment competency are much better criteria for assessing an educational methods (3) so a vast variety of assessment tools have been designed for evaluating the efficacy of this course (4, 5).

Many researches have been done to assess the effectiveness of educational methods on improving students' knowledge and skills. Most of them have evaluated students' ethical judgment in response to ethical problems (6-8). Some have used multiple choice questions or open questions for assessing participants' ethical knowledge (3, 9, 10). Different tests which have been used for evaluating moral judgment (11) are based on the same principles but provide different indices. Different researches have been done using tools such as Moral Judgment Test (MJT) (12), Moral Judgment Interview (MJI) (13), Vignette (14), Sociomoral Reflection Objective Measure-Short Form (SROM-SF) (15) and Defining Issue Test (DIT) (16, 17) for evaluating medical students' moral judgment. Some of them have evaluated students' moral improvement during their academic education (14) and some have compared student's moral competency between two or more universities (15, 18).

The course of medical ethics in Tehran University of Medical Sciences (TUMS) was basically revised in 2006 (19). Before the revision, this course was offered in a teacher-centered and information gathering method while in this revision, we changed the course to be student-centered and problem-based by adding case discussions in small groups and clinical ethics portfolios.

This study was done in order to evaluate the efficacy of the revision in the course of medical ethics by comparing students' knowledge and moral judgment between the semesters before and after the revision and also at the beginning and at the end of the term when the revised course was offered.

Methods

Two groups of students entered the study: 1) fifth year medical students who had taken the course of medical ethics in the second semester of 2006. That semester was the last one in which the unrevised course was offered. This group is called "group A" hereafter. 2) Fifth year medical students who took the revised course in the second semester of 2007. We call this group "B" henceforth.

We used two types of questionnaires. Knowledge questionnaire: this questionnaire consisted of seven multiple choice questions and two open questions. Questions were developed by one of the authors based on the common contents of the unrevised and revised courses on the issues of informed consent, decision making capacity, confidentiality, ethical theories, medical error, euthanasia, conflict of interest and abortion. Two faculty members who revised the course and one who taught this course before the revision evaluated contents and the face validity of the questionnaire.

Moral judgment test questionnaire: This test is an instrument for moral judgment competency evaluation (12), made by Prof. Lind. In this questionnaire, two moral dilemma scenarios are presented with 6 reasons for agreement and 6 others for opposition in each scenario. Responders should mark their level of agreement with each reason. C-index, which is a multivariate analysis of variance, shows how much of a person's judgment in an ethical problem is based on his moral principles and values (20). This questionnaire has been translated to many languages including Persian with an acceptable validity and reliability (21).

At the top of both questionnaires, there was a text explaining the aim of this study and the voluntariness of participation and the fact that the result had no effects on students' evaluation.

Using systematic random sampling, each student was given one of the questionnaires. Students in the Group A entered this study only at the end of the semester while group B took part at the beginning and at the end of the course. At the end of the semester in both groups, we distributed questionnaires in the final exam session and they responded them in the same session after the final exam. Group B students also were given the questionnaires at the first session of the course. Student's responses in groups A and B at the end of the course were compared with each other. We also compared responses of group "B" at the beginning and at the end of their ethics course.

Results

Of 160 students in group A, 149 answered the questionnaires (RR=93.1%) of whom 78 (52%) completed the knowledge questionnaire. Of 95 students in group B at the beginning of course, 67 individuals participated in our study (RR=70%) out of whom 35 completed (52%) the knowledge

questionnaire. At the end of the course in groups B, 105 of 135 students (RR=76/6%) answered the questionnaires; 40 responses belonged to the knowledge questionnaire (40%). Table 1 shows demographic data of the participants.

Table 1 – Demographic characteristics of participants

Group	Sex		Age
	Male	Female	Mean ± SD
Group A – end of term	35 (49.3%)	36 (50. 7%)	23.6±1.1
Group B – beginning of term	32(47/8%)	35 (52.2%)	22.9±1.0
Group B – end of term	54(45.8%)	64(54.2%)	23.7±1.2

Results of knowledge evaluation:

Comparing before and after the course in group B: Mean score of group B students (±SD) at the beginning of the course and at the end of the course was 3.98 (±1.9) and 6.12 (±1.3) out of 9, respectively, that showed a significant increase (P=0.001). Students' knowledge regarding informed consent (P=0.008), competency (P=0.013) and confidentiality (P=0.002) was significantly more at the end of the course compared with the beginning of it (table 2).

Table 2 – Proportion of correct responses to the knowledge questions of different ethical issues in paired cases at the beginning and the end of the course in group B students

Subject	beginning of term Mean ± SD	end of term Mean ±SD
Ethical theories	0.21 ± 0.4	0.43 ± 0.5
Informed consent*	0.27 ± 0.3	0.65 ± 0.4
Medical error	0.64 ± 0.5	0.79 ± 0.4
Competency	0.29 ± 0.5	0.79 ± 0.4
Abortion	0.71 ± 0.5	0.57 ± 0.5
Confidentiality	0.36 ± 0.4	0.76 ± 0.2
Euthanasia	0.71 ± 0.5	0.71 ± 0.5
Conflict of interest	0.50 ± 0.5	0.79 ± 0.4
Total mark	3.98 ± 1.9	6.12 ± 1.3

**The questionnaire consisted of one question on each ethical issue except for informed consent about which there were two questions. In this table, the mean score of those two questions are given.*

Comparing the end of the course data between group A and B: Mean score of group B students at the end of the term (6.12 ± 1.3) was significantly more than the mean score of group A student (3.63 ± 1.7) (P=0.001). Students' knowledge about informed consent (P<0.001), decision making capacity (P<0.001), confidentiality (P<0.0001) and conflict of interest (P=0.001) was significantly higher in group B (Table 3), while knowledge of the two groups were not significantly different on other issues such as medical error, ethical theories, abortion and euthanasia.

Table 3 – Proportion of correct responses to the knowledge questions of different ethical issues at the end of course in group A& B students

Subject	Group A Mean ± SD	Group B Mean ±SD
Ethical theories	0.35 ± 0.5	0.36 ± 0.5
Informed consent*	0.29 ± 0.3	0.52 ± 0.4
Medical error	0.64 ± 0.5	0.7 ± 0.5
Competency	0.28 ± 0.4	0.77 ± 0.4
Abortion	0.42 ± 0.5	0.39 ± 0.5
Confidentiality	0.32 ± 0.3	0.58 ± 0.3
Euthanasia	0.53 ± 0.5	0.63 ± 0.5
Conflict of interest	0.51 ± 0.5	0.79 ± 0.4
Total mark	3.63 ± 1.7	5.25 ± 1.8

**The questionnaire consisted of one question on each ethical issue except for informed consent about which there were two questions. In this table, the mean score of those two questions are given.*

The mean score of students had no significant correlation with their age and gender.

Moral judgment evaluation result:

In this survey, 70 students of group A answered the MJT questionnaire. In group B students, 32 at the beginning of the semester and 63 at the end of semester completed this questionnaire. Based on Prof. Linda's advice, cases with more than two missing data were excluded and for cases with one or two missing values, those missing data were replaced by the student's response to other questions (table 4).

C-index in group A and B at the end of the course had a significant difference (P=0.02), however, pair test of C-index between student's responses at the beginning and at the end of the course in group B showed no difference (P=0.76).

Table 4 – Changes in MJT, their demographic descriptions and C-index

	Total number of students	C-index of all students (SE)	Number of deleted cases (N)	Number of cases with replaced values	Number of cases that entered the analysis	Male proportion	Mean of Age (SE)	Mean of C-index (SE)	Number of paired cases	Mean C-index of cases that entered paired test (SE)
Group A End of term	70	20.71(1.7)	3	19	51	51.9	23.57(1.1)	21.21(2.0)	-	-
Group B Beginning of Term	32	20.11(3.1)	4	-	32	43.8	22.91(0.78)	20.09(3.1)	14	19.32(4.5)
Group B End of term	63	15.80(1.3)	6	7	46	54.3	23.64(0.9)	15.52(1.4)	14	20.63(3.0)

There was no significant correlation between C-index of group A and B and age or gender.

Discussion

In summary, the study results showed that the course had a great effect on knowledge improvement but we failed to find its positive effect on the students' moral judgment.

Other studies that have evaluated the influence of the course of ethics on student's knowledge of medical ethics have shown an improvement of 14-37% (3, 9, 10). Our study also showed a knowledge improvement of 32% comparing with the beginning of the course and an improvement of 36% in comparison with the previous semester (group A), that seems quite prominent.

Moral judgment showed no difference before and after taking the revised course; however, the results showed that the students who took the unrevised course had a better moral judgment in comparison with those who took the revised course. It seems unlikely that the revision of a two-unit course was the reason for this difference. Many cases were deleted because of missing values and the comparison of the C-index of groups A and B before deleting the defective cases did not show a significant difference. The small sample size of the paired cases also reduced the power of the study to show the positive effect of our educational intervention. However, other studies that have used MJT have not shown a significant difference in students' moral judgment during their educational course (12, 22, 23). Moreover, another study that used MJT to evaluate the improvement of medical students' moral reasoning over 3 years of education could not find any significant changes (13).

The reason why this course is not effective on moral reasoning might be the impact of negative hidden curriculum in medical education (13, 24). On the other hand, medical students have a higher basic level of moral judgment in comparison with average people (25).

Small group discussions are effective for teaching high levels of cognitive goals such as analysis and decisions making (26). In this course of medical ethics, from the viewports of both,

students and faculty members, discussions on ethical dilemmas are preferred over lecture (6). The main reason for ineffectiveness of the course on students' moral judgment might be the short length of the course. Furthermore, to be more effective on moral reasoning, teaching ethics should be integrated to the whole duration of medical education.

This study had some limitations. One limitation was the low study power due to the small sample size, especially in the paired cases. In the knowledge questionnaire, the limited number of questions could not provide an acceptable content validity in each ethical issue so we could not interpret the significant differences shown in some ethical issues. Moreover, since the study proposal was prepared at the end of the second semester of 2006, we were not able to evaluate student group A at the beginning of their course.

Course evaluation is an essential component of a course development and has a very critical role in its improvement. Based on the result of this study, more researches with higher sample sizes and using different moral reasoning instruments is recommended for having a comprehensive course evaluation.

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