

Evaluation of Medical Ethics Exams in Terms of Question Types: Review

Tıbbi Etik Sınavlarının Soru Türleri Bağlamında Değerlendirilmesi: İnceleme

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ABSTRACT This review aims to discuss how written exam questions can be designed to promote higher-order learning and thinking, enhance skills necessary for ethical competence, and achieve the fundamental goals of medical ethics education. Written exam questions of the medical ethics courses of the students of a state and a private medical school in Türkiye were examined through an archival research. The archival data was designed as a qualitative research. The question types were classified under 5 headings. Random selections were made among similar question types. Descriptive and text analysis techniques were utilized for analyzing the exam questions' characteristics. Questions were analyzed to ascertain whether they could serve the fundamental objectives of medical ethics education. By critically examining and evaluating the question types, the following conclusions were reached. Question types requiring short answers are insufficient in assessing students' skills for ethical decision-making and reasoning. Open-ended questions are frequently ambiguous and difficult to explain within a framework. Out of scope questions related to merely medical and medico-legal issues do not contribute enough to medical ethics education. Multiple-choice questions (MCQs) including a hint or keyword regarding the answer cannot measure the actual knowledge of students. Case-oriented MCQs that require case analysis have been found to best serve the purposes of medical ethics education. Written exam questions should avoid being unlimited, irrelevant, or having predetermined answers. Case scenarios in MCQs should be used in medical ethics exams as they facilitate analysis, application, synthesis, and evaluation of knowledge, being more effective in developing the relevant skills needed for ethical competence.

Keywords: Medical ethics education; exam question types; question analysis; case scenarios; ethical competence

ÖZET Bu inceleme yazısı, yazılı sınav sorularının üst düzey öğrenme ve düşünmeyi teşvik etmek, etik yeterlilik için gerekli becerileri geliştirmek ve tıp etiği eğitiminin temel hedeflerine ulaşmak için nasıl tasarlanabileceğini araştırmayı ve belirlemeyi amaçlamaktadır. Türkiye'deki bir devlet ve bir özel tıp fakültesinin öğrencilerinin tıp etiği derslerinin yazılı sınav sorularının ilk yazarın arşivinden araştırılması yoluyla incelenmiştir. Arşiv verileri nitel bir araştırma olarak tasarlanmıştır. Soru tipleri 5 başlık altında sınıflandırılmıştır. Benzer soru tipleri arasından rastgele seçimler yapılmıştır. Sınav sorularının özelliklerini analiz etmek için betimsel ve metin analizi teknikleri kullanılmıştır. Sorular, tıp etiği eğitiminin temel hedeflerine hizmet edip edemeyeceklerini belirlemek için analiz edilmiştir. Kısa cevaplar gerektiren soru tipleri öğrencilerin etik karar alma ve muhakeme becerilerini değerlendirmede yetersizdir. Açık uçlu sorular sıklıkla belirsizdir ve bir çerçeve içinde açıklanması zordur. Sadece tıp bilgisi ve tıp hukuku ile ilgili sorular tıbbi etik eğitime yeterince katkıda bulunmaz. Cevapla ilgili bir ipucu veya anahtar kelime içeren çoktan seçmeli sorular öğrencilerin gerçek bilgisini ölçemez. Vaka analizi gerektiren vaka odaklı çoktan seçmeli soruların tıbbi etik eğitiminin amaçlarına en iyi şekilde hizmet ettiği düşünülmektedir. Yazılı sınav sorularının sınırsız, alakasız veya önceden belirlenmiş cevapları olmaması gerekir. Çoktan seçmeli sorulardaki vaka senaryoları tıbbi etik sınavlarında kullanılmalıdır çünkü bunlar bilginin analizini, uygulamasını, sentezini ve değerlendirmesini kolaylaştırır ve etik yeterlilik için gereken ilgili becerileri geliştirmede daha etkilidir.

Anahtar Kelimeler: Tıbbi etik eğitimi; sınav soru tipleri; soru analizi; vaka senaryoları; etik yeterlilik

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Exams held at medical schools play a determining role in “studentship” and “future career” of students, because both level of theoretical knowledge and skills for transforming knowledge into practice are assessed by oral and written exams to train students as physician candidates for medical profession through years. As a matter of fact, exams should essentially measure whether the student, as a decision-maker “in future working life” will have skills for critical and analytical thinking, ethical reasoning, problem-solving and “ethically justifiable decisions”. Exams also reveal the quality of education, whether it has achieved the fundamental purposes, and the reliability and validity of the curriculum as well.¹ Furthermore, learning in connection with willingness to learn increases during the exam period, but decreases at other times.²

The thesis of this study is that, in addition to the exam itself, the exam questions themselves contribute to learning. As the content of questions is generally unforgettable due to its impact on the student, in addition to asking questions in a correct and understandable way, topics asked and question types should also contribute to students’ future professional life.³ Exam results provide students feedback on their levels of learning from “lower order learning” to “higher order learning”, hence guide them for learning and thinking processes.² In fact, exams are one of the determinative components for assessment of quality of medical education by revealing whether the desired learning outcomes and purpose(s) of education have been achieved.^{4,5} Additionally, reliability and validity of the curriculum could be evaluated by the exams, and the quality of exams are determined by the exam technique and the nature of exam questions.^{6, 7}

The nature of questions formed by their quality, types and characteristics effectuate the quality, reliability and validity of the exams in medical ethics education, too. Therefore, exams should serve and contribute to achieve the purposes and objectives of medical ethics education.⁸ These purposes and objectives, in the context of medical ethics education, include acquisition of skills for critical and analytical thinking, ethical reasoning (identifying and analyzing ethical issues/dilemmas), knowing central

concepts, applying the relevant concepts to actual cases, interactional abilities to deal successfully with ethical issues, and ethical decision-making.^{9,10} In brief, exams and questions should also help students to gain “ethical competence” that consists of ethical awareness and sensitivity, including the skills in professional field.¹¹ So, how should be the technique and nature of exam questions to achieve the fundamental objectives and purposes of medical ethics education? Which question types should be used in order to acquire high quality assessments in exams?

This research was conducted to find answers to the questions asked above, to ascertain and analyze how the exam questions should and should not be the impact of question types in learning medical ethics and to contribute to the limited literature on question types in medical ethics education. For this purpose, the question types prepared for the final exams conducted by the first author in both a state and a private university between 1990-2024 were studied. In order to share the experience of many years with the reader, the extent to which these question types can contribute to education and training is evaluated qualitatively in this article.

MATERIAL AND METHODS

In this study, written exam questions of the medical ethics courses of the 1st and 3rd year students of a state and a private medical school in Türkiye is reviewed from the 1st author’s archive. The review covers only 1st and 3rd grade exam questions because ethics courses were only given for 1 semester in these classes for a total of 10-13 hours of explaining basic ethical issues, fundamental theoretical knowledge and terminology. The studied questions had been prepared and implemented solely on the initiative of the instructors, without being subject to any system control.

The archival data was designed as a qualitative research. Descriptive and text analysis techniques were utilized for analyzing the exam questions’ characteristics. The questions were classified to identify themes as content and question types.

Random selections were made among similar question types and out of scope questions. These

questions were grouped under 5 headings: short definition and fill-in-the-blank questions, open-ended questions, out of scope questions; multiple-choice questions (MCQs) that imply answers and case oriented MCQs. Next, the question types and out of scope questions were analyzed in terms of their quality and characteristics to ascertain whether they could serve the fundamental objectives and purposes of medical ethics education. Thus, questions chosen randomly to be analyzed were described as *good* and *bad* examples. Good question proposals were made for questions deemed insufficient for medical ethics education.

RESULTS

Questions types are classified and analyzed below in the context of medical ethics education under 5 themes, as *short answer-definition, classification, fill-in-the-blank questions, open-ended questions, "out of scope" questions, MCQs that imply answers, case oriented MCQs*.

THEME 1: EXAMPLES OF SHORT ANSWER-DEFINITION, LISTING, FILL IN THE BLANK QUESTION TYPES

The following examples could indicate whether the question types of short definition and fill-in-the-blank assess medical students' ethical reasoning:

"Ethical dilemma is....."

"Define moral dilemma."

The meaning of dilemma may be a "necessary condition", but not sufficient condition to develop ethical reasoning skill.

"Define informed consent in medical ethics."

"Explain briefly informed consent."

The definition of informed consent could not assess and improve students' skill for ethical reasoning and decision-making.

"List the principles of medical ethics."

"The four principles of ethics include"

Question types requiring short answers in the form of listing or classification are also insufficient in assessing students' skills for ethical decision-making

and reasoning as the fundamental purposes of medical ethics education. The questions above about listing instantiates the hypothesis presented.

THEME 2: EXAMPLES OF OPEN-ENDED/ UNLIMITED QUESTIONS

Open-ended questions are frequently ambiguous and difficult to explain within a framework. The question, *"Why is the patient-physician relationship so important and how can it be beneficial for the patient?"* does not specify the limits of the relationship. In this question, models of the patient-physician relationship could be emphasized as, *"Compare paternalism with the interpretive model of patient-physician relationship by pointing out the differences between them"*. Also, one of the most important components of the relationship such as "trust" could be emphasized as, *"Why is trust important in patient-physician relationship, in the context of benefit for the patient?"* The question could also be limited within the context of the principles as, *"Discuss the importance of patient-physician relationship through the principles of non-maleficence and respect of autonomy"*.

The question, *"What are the contextual features?"* is an example to unlimited questions. Though the "contextual features" are relevant to ethical decision-making in clinical practice, it is not clear what answer is expected. For example, it can be limited as follows: *"What is the importance of the contextual features during ethical decision-making process in clinical practice?"* Hence, students would not only have to know what *contextual features* are, but they also would comprehend its importance by ethical reasoning.

The fill in the blank question, *"Newspaper announcement of is in general considered unethical"*, is unclear in what respects the unethical nature of newspaper advertisements is being questioned. Whereas, the question implied that "physician advertising" in a newspaper is unethical. If the question had been asked as, *"Newspaper advertisement of is generally considered unethical in the sense of deontology"*, it would have been limited, and so comprehensible.

THEME 3: EXAMPLES OF “OUT OF SCOPE” QUESTIONS

Some of the studied questions were not directly related to medical ethics. Usually these out of scope questions were related to medical knowledge and practice where ethical problems are frequently encountered. For example the question, *“What is the major difference between conventional treatment and a clinical trial?”* regarding human experimentation, asks about the practice itself instead of the ethical problems encountered. If the question had been posed as *“What is the major difference between conventional treatment and a clinical trial in context of medical ethics?”* it would have fallen within the scope of medical ethics.

The following “out of scope” questions ask for definitions of induced and therapeutic abortion. Abortion is an area of discussion in medical ethics, however the questions are not about the ethical problems encountered, but the medical meaning of the applications:

“Define induced abortion.”

“Therapeutic abortion is.....”

If these questions had been regarding the rights of the mother and the foetus in sense of autonomy and non-maleficence, they would have been related to medical ethics.

In the similar vein, the following question, *“Define compulsory sterilization and give an example”*, asks the meaning of compulsory sterilization; and *“The termination of pregnancy may occur in three ways, name and define them,”* asks how to terminate pregnancy. If the questions had been directed to medical ethics as, *“Explain compulsory sterilization in ethical terms and give an example”*; *“Explain with an example the main ethical dilemma/issue(s) in compulsory sterilization”* or *“Explain the fundamental ethical dilemmas/issues in termination of pregnancy, basing your opinion on the relevant ethical principle(s)”* they would have contributed to students’ ethical reasoning about compulsory sterilization and termination of pregnancy.

The following iteratively asked questions, *“Define placebo,”* and *“A treatment that is pharmaco-*

logically inactive but is given under the guise of is called a,” also interrogate medical knowledge rather than issues of medical ethics. These “out of scope” questions could be described as insufficient questions in respect to the purposes of medical ethics education.

Some other “out of scope” questions were about medico-legal issues without questioning the ethical dimension. There were particularly questions about medical jurisprudence, repetitively posed, as presented below:

“The patient who sues the doctor for negligence must prove the existence of..... and that it resulted from the doctor’s.....”

“In order for the doctor to be held liable, the plaintiff must prove that the misdiagnosis was the result of.....”

If the legal and criminal liability of the physician were questioned in the context of ethical principles and values, they would have contributed to medical ethics education.

THEME 4: EXAMPLES OF MCQS THAT IMPLY ANSWERS

When a question includes a hint or keyword regarding the answer, it cannot measure the actual knowledge of students. In written exams, particularly in MCQs, if a word regarding the answer is inside the question, it also gives the answer. This argument can be espoused by the following questions:

“Physicians are obliged to help their patients. If a physician does not assist a patient, thus permitting harm to occur, he/she firstly trespasses the rule of:”

- a. confidentiality **b. non-maleficence**
c. truth telling d. justice e. compassion

“Do not kill”, “do not cause pain”, “do not cause suffering to others” or “do not incapacitate” reflect the principle/rule of:”

- a. non-maleficence** b. justice c. beneficence
d. truth telling e. confidentiality

In the 2 questions presented above, the phrases “not assist a patient”, “permitting harm”, “do not kill”, “do not cause pain”, “do not cause suffer” and

“do not incapacitate” imply “non-maleficence”. Even if the students did not know the principle of “non-maleficence”, they could find the right answer by means of the words, thus eliminating other options.

Some other questions were on similar lines to the above questions:

“Burdens of participation in teaching and research should not be inequitably assigned to poorer and less educated patients. Which principle of ethics specifically demands this judgment?”

- a. beneficence b. non-maleficence
c. **justice** d. truth telling e. autonomy

In the question above, the words “burdens” and “inequitably” referred to “justice”. Therefore, if students knew just the meaning of the word justice, but not the principle of justice, they could reach the right answer.

“The principle of states that patients have the right to be informed and make decisions about their own medical care and self-determination.”

- a. justice b. **autonomy** c. non-maleficence
d. beneficence e. confidentiality

The question above contains the keywords “make decision”, “own” and “self-determination”. These keywords referred to the term “autonomy” and vice versa. Even though students do not know the principle of respect for autonomy, they could find the right answer by means of these words as hints.

THEME: EXAMPLES OF CASE ORIENTED MCQS

The following question regarding informed consent requires case analysis:

“A 14-year-old girl referred to you, a general surgeon, with a complaint of severe abdominal pain of one-week duration. Based on a thorough workup, you narrow your differential diagnosis to several conditions, all of which require surgery and you decide that the best course is exploratory laparotomy as soon as possible. Of the several diagnostic possibilities you are considering, the most likely one can be corrected only by a procedure that carries with it a 50% risk of subsequent sterility, as a result of com-

promising the ovaries and uterus. The girl’s father is deceased and her legal guardian is her mother.”¹²

The foremost ethical issue is the procedure for obtaining:

- a. **informed consent**, b. assumptions,
c. role obligations, d. biomedical research,
e. organ donation

The following question requires the evaluation of ethical principles on a clinical case basis:

“Mrs. H., who is 29-years-old and 20 weeks pregnant, said to Dr. J., “Yes, I still smoke. You’ve told me about the risks at every visit: low birth weight, preterm birth, placental abnormalities, sudden infant death syndrome, but I just can’t let go. The baby’s father and all my friends smoke. I care about my baby’s health, but this addiction is too strong. I think going through the physical and emotional turmoil of quitting now would be worse for my baby. I also feel like it’s ultimately my body and my choice. Don’t you agree, Dr. J.?”

In this case, the ethical dilemma faced by Dr. J. relates to:

- a. Conflict of interest between physician and patient (mother)
b. **Principle of autonomy versus the principle of beneficence**
c. Principle of beneficence versus the principle of non-maleficence
d. Principle of justice versus the principle of non-maleficence
e. Principle of justice versus the principle of autonomy

The question below requires the resolution of an ethical case:

“S. is a 60-year-old woman with metastatic non-small cell lung cancer. She decided to try palliative chemotherapy and “if I don’t get better, I will give up treatment”, she said. After the first treatment with carboplatin and taxol, she required hospitalization for fever and neutropenia, a complication of chemotherapy. You come to visit and she says she feels so bad, she wonders if the chemo is worth it all.”

As the responsible physician, how would you handle this situation ethically?

a) Encourage the patient to discontinue palliative chemotherapy as this is an intervention that provides little benefit.

b. Discontinue palliative chemotherapy due to side effects and medical futility.

c. Continue palliative chemotherapy despite its small benefit and provide psychosocial support.

d. Be certain that the patient is well informed, understands the benefits and burdens, and wishes to proceed with the trial of palliative chemotherapy.

e. Stop chemotherapy and start end of life care.

DISCUSSION

Based on the research data and the questions analyzed as examples, we suggest that short answer-definition, listing, classification-questions, fill-in-the-blank and open ended question types should not be included in the exams, because they can only provide remembering and understanding at the level of “lower order learning and thinking”.¹³ Considering the aims and objectives of medical ethics education, such as critical and analytical thinking, ethical reasoning, knowing central concepts, applying relevant concepts to real cases and ethical decision-making, the above said question types cannot serve to achieve these aims. They also cannot be instructive due to “surface/superficial learning” or mere recall. Also, out of scope questions not directly related to medical ethics but medical knowledge and practice or medical law will not contribute accordingly to the adequate measurement of medical ethics education.

Today multiple-choice question exam is the most common kind of written exams at medical schools because of its advantages.¹⁴ MCQ exams lead less errors on the assessment by defining objective answers as clear criteria, and provides more fairness as well as objectivity by automated scoring system.¹⁵ In addition, unlimited questions are eliminated by the MCQs. However, MCQ exams also have disadvantages, because they could provide students to remember the correct answer, instead of improving the skills for deep-thinking, writing, self-expression,

problem solving, and thus decision-making in the general sense.^{13,16} Nonetheless, MCQs success depends on the writing skill of the person preparing the question, “understanding of the anatomy of MCQs” and professional competence of the instructor.¹⁷ Competence of instructors, while preparing MCQs, is particularly significant in medical ethics education, because medical ethics necessitates to improve students’ “higher-order thinking” involving the skills for transforming knowledge, critical and analytical thinking, ethical reasoning and ethically justified decision making in future clinical practice.^{18,19}

As medical ethics education should include case study/scenario, small group discussion, criteria-based learning and/or team-based learning, could the outcomes of these teaching techniques be assessed by all MCQ exams?^{15,20} All MCQ exams cannot assess students’ skills above-mentioned. MCQs, consisting of definition/short explanation, listing, classification or fill-in-the-blank based on only recalling in lower order thinking and learning, should not be asked. In that case, what type of MCQs questions can evaluate and serve the fundamental goals and objectives of medical ethics education?

We assert that particularly case scenarios in MCQ exams are much more convenient in order to assess and achieve the desired educational outcomes and the purposes of medical ethics education. Advantages of case scenarios as ethical vignettes in clinical settings on learning and teaching are also verified by various researches.^{21,22} It is especially emphasized that the clinical validity of case scenarios makes theoretical knowledge permanent, thus contributing to students’ development of knowledge through future clinical practices.^{23,24} The most fundamental benefit of case scenarios in MCQs is to assess ethical knowledge, skills and competence regarding the real life/clinical setting more than a “simple cognitive assessment”, because case scenarios can assess “know how” by interpretation and application as well as “know”.^{25,26} In other words, case scenarios provide to assess “remembering, understanding/comprehension, applying, analyzing, evaluating” knowledge as stated in Bloom’s taxonomy that demonstrates a hierarchical structure of cognitive skill levels from the lowest to the highest.^{27,28} Hence, MCQ exams comprising cases can assess students’

skills for the use and transfer of knowledge to the relevant tasks and contexts. “Lower order learning” and “higher order learning” both can be assessed by MCQs involving case scenarios.^{13,29}

A study that will examine the rates at which the types of questions discussed are asked in medical ethics courses will make a great contribution to the evaluation of the subject. This issue also needs to be examined statistically in the context of the distribution of question contents and repeated questions.

CONCLUSION

The nature of exam questions formed by their quality, types and characteristics also effectuate the quality, reliability and validity of the exams as well as education in medical ethics. Exam questions should promote and enhance students’ higher order learning and also the necessary skills such as ethical reasoning and ethical awareness. In other words, exam questions should be instructive, hence serve the fundamental objectives and purposes of medical ethics education. These purposes and objectives involve the acquisition of skills for critical and analytical thinking, ethical reasoning, applying the relevant concepts to actual cases, interactional abilities in further clinical settings. At this point, the nature of questions has a determinative role whether to achieve the purposes and objectives in medical ethics education.

This research indicates that the question types “short answer-definition, listing, classification and fill-in-the-blank” asked in medical ethics exams are mostly based on only recalling in lower order learning, but not on higher order learning and enhancing the necessary skills. The exams consisting of out of scope and unlimited questions and MCQs implying answers are also inadequate to meet the goals of medical ethics education.

Requesting case analysis in multiple choice questions should be continued in exams as “good” question types. As ethical vignettes in clinical settings, case scenarios can provide students the opportunity to analyze, transform, apply, synthesize and evaluate knowledge, and improve the relevant skills for having ethical competence; and also shed light on whether they could put what they have learned into practice in their future professional lives.

In this review, only question types were examined and discussed in terms of their qualities in the context of their possible contributions to medical ethics education. Question types and contents were not presented in quantitative distribution and tables, but were planned as the second stage of the study.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Hatice Nil Sari; **Design:** Hatice Nil Sari, Gamze Nesipoğlu; **Control/Supervision:** Hatice Nil Sari, Gamze Nesipoğlu; **Data Collection and/or Processing:** Gamze Nesipoğlu; **Analysis and/or Interpretation:** Hatice Nil Sari, Gamze Nesipoğlu; **Literature Review:** Gamze Nesipoğlu; **Writing the Article:** Hatice Nil Sari, Gamze Nesipoğlu; **Critical Review:** Hatice Nil Sari, Gamze Nesipoğlu.

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