

Teaching Medical Ethics in Graduate and Undergraduate Medical Education: A Systematic Review of Effectiveness

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Abstract

Objective One objective was to identify and review studies on teaching medical ethics to psychiatry residents. In order to gain insights from other disciplines that have published research in this area, a second objective was to identify and review studies on teaching medical ethics to residents across all other specialties of training and on teaching medical students.

Methods PubMed, EMBASE, and PsycINFO were searched for controlled trials on teaching medical ethics with quantitative outcomes. Search terms included ethics, bioethics, medical ethics, medical students, residents/registrars, teaching, education, outcomes, and controlled trials.

Results Nine studies were found that met inclusion criteria, including five randomized controlled trials and four controlled non-randomized trials. Subjects included medical students (5 studies), surgical residents (2 studies), internal medicine house officers (1 study), and family medicine preceptors and their medical students (1 study). Teaching methods, course content, and outcome measures varied considerably across studies. Common methodological issues included a lack of concealment of allocation, a lack of blinding, and generally low numbers of subjects as learners. One randomized controlled trial which taught surgical residents using a standardized patient was judged to be especially methodologically rigorous.

Conclusions None of the trials incorporated psychiatry residents. Ethics educators should undertake additional rigorously controlled trials in order to secure a strong evidence base for the design of medical ethics curricula. Psychiatry ethics educators can also benefit from the findings of trials in other disciplines and in undergraduate medical education.

Keywords Medical ethics · Teaching · Medical student · Resident education

Medical school and residency training programs are becoming increasingly eager to foster a more robust medical ethics teaching environment [1–3]. As with every well-developed curriculum for students and residents, medical educators have the responsibility to base their medical ethics curricula on existing evidence of efficacy [4]. Planning curricula in light of careful review of the literature on the efficacy of medical ethics education is an essential component of discharging this pedagogic responsibility.

There are very few reviews of the literature on the effectiveness of medical ethics undergraduate and graduate medical education. One prior systematic review of ethics education literature, now somewhat dated, categorized studies on undergraduate education based on their goals and outcomes but was not selective by design of studies and did not provide a critical appraisal of individual studies [5]. This review included studies evaluating the effectiveness of various teaching methods and other empirical studies and found deep shortcomings in the literature. Variations in how ethics is taught [6] underscore the importance of a better understanding of instructional efficacy and educational outcomes.

As medical students and residents proceed through training, professional and moral developments remain vital aspects of being a physician [7, 8]. Medical ethics education aids in

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the maturation of morality. Moral development is not the work solely of the ethics curriculum but of the entire curriculum. The distinctive contribution of an ethics curriculum, which is the focus of this review, is to teach a component of moral development namely the ethical reasoning requisite to becoming a professional. This study therefore undertook a comprehensive systematic review to critically appraise controlled trials of ethics education for psychiatry residents as well as residents in other disciplines and medical students. The study aimed to evaluate the strengths and weaknesses of controlled trials aimed at assessing the effectiveness of medical ethics teaching.

Methods

A standardized methodology for conducting educational systematic reviews was used [9]. Utilizing PubMed, EMBASE, and PsycINFO databases, as well as the reference lists of relevant research publications and reviews, combinations of the following key terms were employed within the literature search: ethics, bioethics, medical ethics, medical students, residents/registrars, teaching, education, outcomes, and controlled trials. Inclusion criteria consisted of papers published in the English language from 1990 to March 2016, a focus on teaching medical ethics, the presence of a controlled trial, and a quantitative outcome measure focusing primarily on ethics education competencies. Studies included described an educational intervention benefitting medical students or residents and included a comparison group that did not receive the educational intervention. Exclusion criteria consisted of papers on professionalism or reports that did not have a control or comparison group separate from the intervention group or studies that focused solely on specific aspects of biomedical research (i.e., stem cell, genetics, etc.).

After initial searches, three of the authors (S.D., V.P., K.T.) met regularly to discuss potentially relevant articles and whether or not these met inclusion criteria. Four authors (J.C., S.D., V.P., K.T.) critically and independently appraised all the reports that met inclusion criteria. To score the articles, standards developed by the Evidence-Based Medicine Working Group for establishing the validity of a study were implemented [10]. These criteria included the following: the presence of randomization; the presence of concealment of randomization; the identification of differences between groups at baseline; the presence of blinding; reports of dropout rates; reports of the intention to treat; and the validity and reliability of the outcome measures used. Each article scored either a 0 or 1 for each criterion for a maximum of 7 points. Any differences in scoring among raters were resolved through discussion until a consensus was reached.

Results

Of the 1120 papers identified, most were excluded as they neither discussed teaching medical ethics nor were controlled trials. As seen in Table 1, nine studies met the inclusion criteria for this review [11–19] including five randomized controlled trials (RCTs) [12–16] and four controlled non-randomized trials (CNRTs) [11, 17–19]. Five studies took place at institutions outside of the USA, including Scotland [11], Canada [12, 14], New Zealand [13], and Singapore [19]. Five of the studies included medical students [11, 13, 15, 18, 19]. Three studies included residents in general surgery [12], medicine [16], and orthopedic surgery [17], and one study included family medicine preceptors with the main outcome measure being performance of students whose preceptors were invited to a workshop in medical ethics compared to the performance of students whose preceptors were not invited to the workshop [14]. One study evaluated small group ethics teaching in a new medical curriculum and used a comparison group from the last year of teaching of the traditional curriculum [11]. A follow-up to this study was conducted after 3 years of teaching with the new curriculum at which time there was no separate comparison group [20], and therefore, this follow-up study was excluded in this review. Educational interventions included one or more of the following: small group discussions, case-based curriculum, standardized patients, workshops, training of preceptors, criteria-based learning, and writing-based teaching. Assessment methods were heterogeneous. No two studies used precisely the same outcome measures.

Each study received a total score of zero to seven based on validity criteria as seen in Table 2. The randomized controlled trial from the University of Toronto garnered the highest validity rating among the studies at seven out of seven points, meeting all validity criteria [12]. In this study, first and second year surgical residents at the University of Toronto were randomized into groups by blocks of ten and allocations were concealed. Twenty-nine experimental participants were given 1 h with a standardized patient (SP) to have an interactive discussion while the control group was taught by a traditional 1 h seminar. Both groups were then evaluated with a 10-min SP interview to obtain informed consent for elective laparoscopic cholecystectomy and graded on performance by three independent observers. Participants also answered 20 short answer questions. Knowledge scores and performance on the SP interview showed that the traditional seminar was superior to the SP-based seminar.

Four studies that ranked second in quality, each with a score of 5, were randomized controlled trials [13–16]. All four lacked concealment while three were not blinded [13, 15, 16], and one worked with residents [14] while the other three worked with medical students [13, 15, 16]. One trial evaluated 141 clinical-year medical students [13] including 65

Table 1 Characteristics of trials on teaching medical ethics

Authors	Study type	Learners (type and training level)	No. of exp, control participants	Assessment methods and tools	Intervention for participants; for controls	Outcomes
Sulmasy et al. 1993 [16].	RCT	Internal Medicine house officers at Johns Hopkins Hospital	40, 40	Post-intervention questionnaire, MC test	Lectures and case conferences (Ex), Lecturers only (Li); no intervention	Significantly greater confidence regarding ethical issues in intervention group. No significant difference in knowledge scores between groups
Hennen et al. 1994 [14].	RCT	Medical students on family medicine rotation at University of Western Ontario	32, 36	Responses to ethical vignettes compared to ethical consensus	Student's preceptor attended 3-h ethics workshop; preceptor did not attend	No significant differences between performance of students whose preceptors attended the workshop and those who did not
Coverdale et al. 1997 [13].	RCT	5th year medical students at University of Auckland, New Zealand	65, 76	Pre- and post-course questionnaires on attitudes toward specialist doctors' social and sexual contact with patients	One 3-h session on patient-physician boundaries; no instruction	The session significantly influenced attitudes regarding hugging and sexual contact with former patients but not attitudes toward hugging, dating, or sexual contact with current patients
Wenger et al. 1998 [17].	CNRT	Orthopedic surgery residents at UCLA	25, 30	Pre and post-intervention questionnaires	Case-based ethics curriculum; no formal ethics education	Significantly greater mean score improvement in intervention group
Goldie et al. 2001 [11].	CNRT	1st year students at University of Glasgow Medical School	111, 51	Pre and post-course exam	New case-based small group discussion; lecture and ethics seminar	Significantly greater increase in post-test consensus answers in experimental group
Smith et al. 2004 [18].	CNRT	3rd year medical students at U of Washington	80, 66	Identifying ethical issues in a sample case	Discussion-based teaching; written-based teaching	Discussion group had a higher absolute increase in total score and ability to formulate a plan on final case analysis
Robb et al. 2005 [12].	RCT	1st and 2nd year surgical residents at University of Toronto	29, 31	SP interview scores based on 22 item checklist	Interaction with SP; 1-h interactive discussion	SP seminar group had lower SP interview and knowledge scores compared with a traditional seminar
Roberts et al. 2005 [15].	RCT	1st through 4th year medical students at University of New Mexico SOM	83, 27	Asked participants to identify ethical problems in 10 vignettes	Criteria-based learning method/20 min presentation; no instruction	The criteria-focused group were better able to discern specific ethical problems compared to controls
Chin et al. 2011 [19].	CNRT	1st year students at National University of Singapore Yong Loo Lin SOM	119, 164	Pre- and post-course questionnaire	New biomedical ethics curriculum; ad hoc teaching	Experimental cohort acquired more knowledge and confidence

RCT randomized controlled trial, CNRT, controlled non-randomized trial, SP standardized patient; SOM, School of Medicine

experimental group students who underwent one 3-h session that taught appropriate social and sexual boundaries in patient-physician relationships. Although students in the experimental group had significantly different attitudes toward hugging and sexual contact with former patients, there was no difference between groups in attitudes toward hugging, dating, or sexual contact with current patients. Another trial studied 111 medical students on a family medicine rotation [14]. Thirty-two students in the experimental group had preceptors who attended a 3-h ethics workshop while the control group had preceptors who did not receive outside ethics training. No

significant difference was noted in student performance between groups when comparing written answers to a case scenario involving ethical issues in the management of a dying patient to "ideal" answers collated by "experts." The third study [15] examined 83 preclinical and clinical medical students in their ability to evaluate ethical aspects of human studies. One experimental group learned how to assess ethical aspects of research protocols by using a criteria-based learning method with the Research Protocol Ethics Assessment Tool (RePEAT). A second experimental group used a clinical research participant-based learning method involving a 20-min

Table 2 Validity assessments of educational program trials

Study	Randomization methods	Concealment	Group differences	Blinding	Follow-up or intention to treat	Instrument validity	Reliability	Total
Sulmasy et al. 1993 [16].	1	0	1	0	1	1	1	5
Hennen et al. 1994 [14].	1	0	0	1	1	1	1	5
Coverdale et al. 1997 [13].	1	0	1	0	1	1	1	5
Wenger et al. 1998 [17].	0	0	1	0	1	0	0	2
Goldie et al. 2001 [11].	0	0	1	0	0	0	0	1
Smith et al. 2004 [18].	0	0	0	0	1	1	1	3
Robb et al. 2005 [12].	1	1	1	1	1	1	1	7
Roberts et al. 2005 [15].	1	0	1	0	1	1	1	5
Chin et al. 2011 [19].	0	0	1	0	0	1	1	3

presentation of personal experiences in clinical protocols and interviews. The control group received no instruction. The criteria-based intervention showed significant improvement in sensitivity for detecting problems in research ethics compared to controls while the research participant-based learning group identified fewer ethical problems compared to the controls.

The remaining four studies had scores ranging from 1 to 3 [11, 17–19] and used various interventions, assessments and outcomes. Three used a pre- and post-course questionnaire or exam format for assessment after a case-based intervention via lectures or small group discussions [11, 17, 19] and one used written case analyses with or without a discussion group [18]. Four studies reported a significant improvement in knowledge and/or learner satisfaction with the experimental intervention [17–19]. None of the studies that met inclusion criteria for this review provided data that allowed the calculation of a number needed to teach (the number required to be taught for one to benefit).

Discussion

One objective of this review was to identify and appraise controlled trials of teaching medical ethics to psychiatry residents. None of the trials that were found focused on ethics teaching to psychiatry residents. Psychiatric educators may gain insights from trials in other residency disciplines or in undergraduate medical education. Some of the trials taught on issues pertinent to psychiatric ethics such as confidentiality [11, 16–19], and informed consent [11, 12, 16–19]. The papers on residency teaching [12, 16, 17] focused on only the three specialties of general and orthopedic surgery and internal medicine. The scope of research needs to expand to psychiatry as well especially given the importance attributed to ethics in the professional development of psychiatrists [21–23].

Notably, only nine papers met inclusion criteria. These included five randomized controlled trials [12–16] and four

controlled non-randomized trials [11, 17–19], and the studies included in this review were vastly heterogeneous when it came to differing levels of training involved, teaching topics, assessment methods, and described outcomes. This dearth of consistent research is surprising, given the importance attributed to teaching medical ethics. Educational levels of the trainees involved in these studies ranged from first year medical students to upper level internal medicine and surgical residents. Academic locations also spanned from Singapore and New Zealand to the United States and Canada, and teaching interventions included direct effects of SP encounters, lectures, and case-based small group discussions as well as the indirect effects of preceptor training [14].

The quality of the studies varied considerably. The article judged to be of the highest quality [12] involved teaching medical ethics to surgical residents at the University of Toronto. Comparing the studies that focused on medical students versus residents, the trials involving residents typically had smaller numbers of participants, and two of the three studies of residents [16, 17] were questionnaire-based assessments while one [12] was SP-based. Only one of the randomized controlled trials implemented concealment of allocation [12] and only two trials total incorporated a method of blinding [12, 14]. All but two trials [11, 17] were adequate in demonstrating the validity and reliability of their intervention tools, and each study had a different duration of both how long the intervention itself took to administer as well as follow-up.

Outcome measures also varied widely as trials focused on different aspects such as knowledge scores on different ethical content, confidence regarding ethical issues, attitudes, SP interactions, and case analysis. Most trials were able to demonstrate a significant difference before and after their intervention, but several showed no significant difference in knowledge scores [16], responses to ethical vignettes [14], or particular attitudes on post-questionnaire regarding the curriculum at hand [13]. No replication studies were found, and a definite lack of consistency in

teaching methods and curriculum content became apparent across studies. With such an array, the true effectiveness of these methods of ethics teaching cannot currently be well assessed especially with a lack of replication studies. The generalizability of results across studies proved difficult given the significant differences between trials when it came to study designs, learners involved, and even marked cultural differences that may come into play with ethical considerations in different countries.

Going forward, research would greatly benefit from agreement on a small set of validated and reliable tools to assess knowledge, attitude, and skills of learners. For psychiatry residents, these should assess outcomes related to the Milestone competencies of the Next Accreditation System [24]. While RCTs may be the gold standard in most evidence-based medicine, curriculum designers may have difficulty structuring their teaching based on the results of such a heterogeneous set. Moreover, barriers to conducting educational RCTs include time, funding, controlling all potential confounding variables, and achieving a significant sample size especially in residency settings in order to detect a difference between groups when a true difference exists. Randomized controlled designs, when well conducted, are justifiably heralded as a high-quality design in medical education research because they function to enable causal inferences by tightly controlling the relevant variables [4]. One paper [14] evaluated how providing a seminar for teachers in family medicine might affect the learning of medical students. This was a potentially valuable pedagogical experiment because of a reliance on clinical faculty to teach medical ethics. Interestingly, the study found no difference between students in their responses to the ethical vignettes who had preceptors who participated in the medical ethics teaching seminar and preceptors who did not. This suggests that controlled trials to alter what teachers do should be designed to produce a larger effect, given the necessary small sample of such pedagogical research.

The findings are limited by the search terms and databases used. It is possible that we did not find all relevant articles. Additionally no search was completed for non-English-language articles. The scoring system for appraising articles also did not take account of some details of methodology such as how randomization or blinding was achieved or the adequacy of methods of concealment of allocation. Another set of authors might also have scored the quality of articles differently, which is a challenge managed here by adopting a rigorous consensus process. This review demonstrates, nevertheless, that there is an emerging body of research on medical ethics pedagogy using controlled trials. Both the number and quality of trials need to increase and the scope of research needs to expand to include psychiatry residents in order to secure the strongest possible evidence base for the provision of medical ethics teaching.

Compliance with ethical standards

Disclosure On behalf of all authors, the corresponding author states that there is no conflict of interest.

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