The impact of a modern medical curriculum on students' proposed behaviour on meeting ethical dilemmas

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OBJECTIVE To evaluate the impact of a modern medical curriculum on students' proposed behaviour on encountering ethical dilemmas.

DESIGN Cohort design.

SETTING University of Glasgow Medical School.

SUBJECTS The first intake of students into Glasgow's new curriculum ($n = 238$).

MAIN OUTCOME MEASURE Student answers consistent with consensus professional judgement on the ethical dilemmas posed by the vignettes of the Ethics and Health Care Survey Instrument.

RESULTS The probability of giving a consensus answer was lowest pre-Year 1 and highest post-Year 1. It reduced slightly post-Years 3 and 5, but remained significantly higher than at pre-Year 1. The performance of students undertaking a 1-year intercalated BSc, however, appeared to regress on testing post-Year 4.

CONCLUSIONS While the first year of the curriculum had a positive impact on students, the remainder of the curriculum did not impact to the same extent. These findings support the recommendation that small group teaching, the predominant teaching method in Year 1, should be preferred to lecture and large group teaching, the predominant method of the remaining curricular years. Full integration of ethics and law teaching within the rest of the curriculum is recommended, particularly during the clinical years. This has training implications for all medical teachers involved in the curriculum. The assessment of ethics should be incorporated into all formal examinations. It is recommended that ethics be addressed as part of a wider approach to professionalism in order to promote integration.

INTRODUCTION

Despite the recent inclusion of medical ethics and law in the core of most modern curricula, few outcome evaluation studies have been performed.[1] The findings of previous studies[2–14] have indicated a decline in students' ethical sensitivity as they pass through the medical curricula,[2] and a substantial change in their attitudes towards ethical issues between the early and later stages of the curriculum.[4] In longitudinal studies following students through the entire curriculum, the improvement in students' moral reasoning abilities was found to be little more than would be expected for their age and level of education.[7,10]

The favoured approach to outcome evaluation in recent years has been to use instruments which incorporate case vignettes.[1,8,10] Such instruments contextualise ethical dilemmas for students, and have the potential to measure ethical behaviour in 3 of the

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Overview

What is already known on this subject

While the early curricular years may impact positively on students' moral reasoning and ethical sensitivity, the later curricular years have been found to have an adverse effect. Small group teaching may have a greater impact on moral reasoning than lecture or large group teaching.

What this study adds

This study, examining students' potential ethical behaviour, found an improvement in performance following Year 1, but no further improvement. It is hypothesised that the predominance of small group teaching in Year 1 is a contributing factor.

Suggestions for further research

Further testing of the hypothesis is required.

4 dimensions of Rest's model of ethical behaviour (measurement in the fourth dimension requires subjects to be in clinical practice).[15]

There have been no studies observing the effect of an entire modern medical curriculum on students' potential behaviour on meeting ethical dilemmas. The launch of the University of Glasgow's new medical curriculum in October 1996 provided the opportunity to study the effect of medical education on students' proposed behaviour on facing ethical dilemmas, longitudinally. The effect of the first 3 years of the curriculum have been previously reported.[12,13] This study considers the effect of the entire curriculum.

Format of ethics education in Glasgow University's medical curriculum

The format of ethics teaching in the first 3 years of the Glasgow curriculum, along with the aims of ethics teaching, has been previously described.[12,13] In Years 4 and 5, the predominantly clinical years of the curriculum, formal ethics teaching consists of 2 × 2-hour small group workshops on Inter-Professional Education and Ethics in General Practice, along with 11 half-day, topic teaching lecture and

large group sessions. While each of the half-day sessions contains an ethical component, only 1 of the sessions is directly related to ethics and law. The topics covered are shown in Table 1.

Assessment of students' learning in medical ethics is incorporated into the first and final MB examinations. It does not appear in the second or third MB examinations.

Study aim

This study aimed to judge the impact of an integrated medical curriculum, in which ethics and law is a core vertical theme, on students' potential behaviour when facing ethical dilemmas.

METHODS

A cohort design was adopted.

Subjects

Study subjects comprised the first intake of students into Glasgow's new curriculum ($n = 238$).

Instrument

The Ethics and Health Care Survey Instrument (EHCI) was used.[12,13] The EHCI consists of 12 case vignettes which include an ethical dimension. Nine

Table 1 Topics covered in the 11 half-day topic teaching sessions in years 4 and 5 of the medical curriculum

Session	Subject
1	Genetics and disease
2	Psychosocial aspects of disease
3	Gender and racial issues in medicine
4	Will you live to be 100?
5	Screening
6	WOSCOPS and beyond
7	Palliative care
8	Medico-legal issues
9	Diseases of lifestyle
10	Rationing health care
11	Ethics in clinical practice*

* Session run by ethicist.

of the 12 cases feature 'consensus problems'. The other cases feature 'knife edge problems', about which professional judgments are scarce or divided. Subjects are asked to choose 1 of the pre-set answers to each case vignette and to justify their choice. To determine the effectiveness of the teaching, only the answers to the consensus questions were considered in the analysis.[12,13]

In October 1996 the EHCI was distributed to all students entering the new curriculum. There was no compulsion for students to undertake the questionnaire. The EHCI was distributed post-Year 1, the year in which the largest proportion of ethics sessions take place,[12] and post-year 3 following completion of the Vocational Studies course, where most of the formal curricular ethics teaching occurs.[13]

A total of 101 students left the curriculum after year 3 to undertake an intercalated BSc, of whom 70 had previously completed an EHCI. The remaining students entered the predominantly clinical years of the curriculum. In April 2001 the EHCI was distributed to the students who were in the process of completing the medical curriculum, and to the students who had returned to the curriculum after completing a 1-year intercalated degree and were in the process of completing Year 4.

Students' responses to the consensus questions in each questionnaire were tabulated on an EXCEL spreadsheet.

Analysis

This paper focuses on the analysis and presentation of the results of the students' responses to the pre-set answers to the consensus questions. The analysis of data on students' justifications of their answers has been the subject of previous papers.[16,17]

Statistics

Statistical analyses were performed using S-PLUS Version 4.5.

All students completing the EHCI on at least 1 occasion during the study period were included. The number of students completing the EHCI at each timepoint is shown in Table 2. All responses to questions for which there was a professional consensus answer were coded as consensus or not. The number and percentage of consensus answers to each question, on each occasion, were calculated. To investigate trends over time in the probability of giving consensus answers, logistic regression models were used. Question and timepoint were included as categorical predictor variables, and the likely correlation between a student's responses over time was accounted for by the generalised estimating equations approach.[18]

For each question, interaction terms were added to the model to test whether the time trends in responses to the question were the same as the time trends for responses to the other questions. Where the Wald statistic for the interaction terms showed some evidence of a different trend for a particular question, the coefficients for the individual interaction terms were assessed to determine in what way that particular question differed from the others.

RESULTS

Table 3 shows the percentage of consensus responses given to each question, at each timepoint. Also shown are the percentages of consensus responses across all questions at each timepoint, across all timepoints for each question, and across all 4499 responses. The interaction provides information on how the time trend for each question differs from those for the other questions.

In general, the logistic regression model shows that the probability of giving a consensus answer was lowest prior to Year 1 and highest at the end of Year 1; thereafter it reduced slightly, but remained significantly higher than prior to Year 1. The exception to this concerned the intercalating

Table 2 Number of students from each subgroup completing an EHCI at each timepoint

	Pre-Year 1	Post-Year 1	Post-Year 3	Post-Year 4	Post-Year 5
Straight to clinical	103	77	51	0	69
Intercalating	62	50	34	57	0

Table 3 Number (%) of consensus answers by question and occasion, with χ^2 tests for interactions between individual questions and occasion

Occasion	Number of questionnaires	Question									
		1	2	4	5	6	8	9	10	12	All
Pre-Year 1	165	84.2%	93.9%	78.7%	72.4%	52.7%	20.9%	49.4%	64.6%	53.1%	63.4%
Post-Year 1	127	85.8%	96.0%	84.8%	85.8%	73.0%	33.3%	54.3%	66.9%	52.0%	70.2%
Post-Year 3	85	88.2%	92.9%	82.1%	83.5%	70.6%	32.1%	58.3%	60.7%	52.9%	69.1%
Post-Year 4*	57	89.5%	87.7%	77.2%	93.0%	75.4%	21.1%	52.6%	47.4%	56.4%	66.7%
Post-Year 5	69	85.5%	95.6%	82.6%	85.5%	76.8%	25.0%	59.4%	62.3%	49.3%	69.1%
All	503†	86.1%	93.8%	81.2%	81.8%	66.7%	26.5%	53.9%	62.3%	52.6%	67.2%
Q × O interaction χ^2		2.59	4.65	0.90	9.46	15.28	4.15	2.02	14.92	8.50	
P		0.63	0.33	0.92	0.051	0.0042	0.39	0.73	0.0049	0.075	

* 1-year intercalated students, surveyed 5 years after the start of the course, at the end of their fourth year of study.

† 196 students completed at least 1 questionnaire, and a total of 503 questionnaires were analysed

Q × O = question × occasion interaction.

students, for whom the proportion of consensus answers post-Year 4 lay between those before and after Year 1, although it did not significantly differ from either. However, if these students are combined with the post-Year 5 respondents, a consistent pattern of sustained improvement following the first year is seen.

There is some evidence that the trend over time in the proportion of consensus answers given to questions 5, 6, 10 and, to a lesser extent, 12, may differ from the average time trend. For questions 5 and 6, the improvement during the first year was greater than for other questions ($P = 0.073$ and $P = 0.0092$ for interaction terms between questions 5 and 6 and the change during Year 1). The intercalating students also performed somewhat better on question 5 than might be expected from the overall trend ($P = 0.056$). For question 10, the intercalating students performed significantly worse than expected ($P = 0.022$). Unlike all other questions, there was no improvement on question 12 post-Year 1, ($P = 0.019$), or following the remainder of the curriculum.

DISCUSSION

Cohort studies are particularly appropriate in research on human growth and development. They allow the researcher greater opportunity to observe trends and to distinguish 'real' changes from chance occurrences.[19] This study, like most cohort studies, suffered from sample mortality. However, subjects participating were found to be representative of the year as a whole.[12,13,16,17] Cohort studies can also suffer from 'control effects', which represented a threat in a situation where the same instrument was used on 4 separate occasions. However, the time intervals of 1 year between the first and second stages, 2 years between the second and third, and a further 2 years between the third and final stages made this less likely. In addition, students received no feedback on what the 'correct' answers were or on how they performed individually, and 3 of the 12 vignettes were non-consensus vignettes for which there were no 'correct' answers.

Cohort studies can also suffer from the interaction of biological, environmental and intervention influences. In medical curricula, the longer students are exposed to the curriculum and the process of 'moral enculturation', the greater is the risk that their ethical development will be detrimentally affected.[20] The effect of this process has to be considered in interpreting the findings.

The findings of the study suggest that while the first year of the curriculum had a positive impact on students' potential behaviour on facing ethical dilemmas, the remainder of the curriculum did not appear to impact to the same extent. Analysis of

individual vignettes indicates that the areas of autonomy, confidentiality and consent, the main thrust of first year teaching, were the areas where there was the greatest movement towards the consensus judgements of informed professionals.[12] The improvement post-Year 1 was nevertheless sustained post-years 3 and 5. The performance of the intercalating students, however, appeared to regress as they reached the later curricular years. This regression appears to be mainly due to a worse than expected performance in the whistle blowing vignette.

A statistically significant increase in the probability of giving the consensus answer, from 63% pre-Year 1 to 70% post-Year 1 (sustained post-Years 3 and 5 at 69% on both occasions), may not initially appear to be substantial from a contextual point of view, particularly as most of the increase comes from changes in 2 vignettes.[12] However, the interrelationship of the vignettes is important. Vignettes 1, 2, 4, 5, 6 and 8 are linked in terms of the issues contained, while vignettes 9, 10 and 12 deal with issues of professionalism.[13] In addition, students rarely start their ethical learning from a position of having little or no knowledge, or having few opinions on ethical matters.[8,13,16,17] Pre-curriculum students scored highly in vignettes 1, 2 and 4 (84%, 94% and 79%, respectively), making significant improvement more difficult to detect, and also scored reasonably well on vignettes 5, 6, 10 and 12 (72%, 53%, 65% and 53%, respectively).

The lack of significant improvement post-year 1 for vignettes 9, 10 and 12, which deal with issues of professionalism, is perhaps not surprising in view of the fact that there was no formal teaching on these issues during year 1.[12] However, the lack of improvement following the remainder of the curriculum, particularly years 4 and 5 where the emphasis of formal ethics teaching is on professional issues, is disappointing.

Previous studies have also shown improvement in students' performance following ethics teaching in the first year of the curriculum. Self *et al.* found an increase in the moral reasoning skills of students from Texas.[5,6] Improvement in moral reasoning following teaching in the early years of the medical curriculum was also found among Danish students.[9] Shorr *et al.* from the University of Virginia, using an instrument which incorporated case vignettes to measure students' factual knowledge and attitudes towards ethical dilemmas, found an improvement in students' factual knowledge, but little improvement

in students' attitudes following a first year ethics course.[8]

After an initial improvement the remaining curricular years have been found to have an adverse effect on students' ethical development. Hebert *et al.*, measuring ethical sensitivity amongst medical students in different years of the curriculum, found an increase in sensitivity between Years 1 and 2, but a decrease in the later years of the curriculum.[2] Patenaude *et al.*'s cohort study of Canadian students in the first 3 years of a medical curriculum found a levelling process in students' moral reasoning with time.[14] Self *et al.*, testing students' performance on Rest's Defining Issues Test pre- and post-Year 1 and post-curriculum, found no further improvement in the moral reasoning skills of female students after Year 1, and a deterioration in those of male students by the end of the curriculum, correcting for the expected rise in scores associated with education at this age and level.[10]

The effects of the hidden curriculum, including the process of moral enculturation, have been postulated as a factor in the deterioration found in students' ethical abilities as they pass through medical curricula.[2,5,7,10,14,20] While it may contribute to the lack of further improvement in Glasgow students' performance after Year 1, the structure and process of the remaining years of the formal Glasgow curriculum may also adversely influence students' development. In Year 1 students receive 30 hours of mainly small group teaching. Between Years 2 and 3, however, they receive only 14 hours of mainly lecture and large group teaching. In Years 4 and 5 they receive a further 4 hours of small group and 2.5 hours of lecture and large group ethics teaching. Ethical issues are also addressed during a further 10 2.5-hour lecture and large group, topic teaching sessions. There is evidence to suggest that small group teaching may be more effective than lecture and large group teaching in promoting students' ethical development. Self *et al.* found that students exposed to small group, case-study discussion demonstrated greater increases in their moral reasoning abilities than did those receiving lecture-based courses.[5] They also found that the effect on moral reasoning abilities occurred only when students were exposed to 20 hours or more of small group teaching.[11] Our previous study, comparing students from the first year of the new curriculum with controls from the old curriculum, showed small group teaching to be more effective than lecture and large group teaching in improving scores on the EHCI.[12] Perhaps

part of the explanation is that the small group process is conducive to transformative learning, an effective approach to bioethics teaching.[21] To meet the goals of the UK Consensus Statement on the ethics curriculum, it is recommended that educators enable students to 'think critically about ethical issues…to reflect upon their own beliefs about ethics, to understand and appreciate alternative and sometimes competing approaches and be able to argue and counterargue in order to contribute to informed debate.'[22] Successful transformative learning questions assumptions, provides support from others in a safe environment, provides challenge, examines alternative perspectives and provides feedback. New assumptions are tested in the 'real' world or in discussion with others.[23] The promotion of transformative learning requires educators to become members of the group and adopt a 'reformist' perspective.[24] The process evaluation of ethics teaching in the first year of the curriculum suggested that the structure and process of the small group sessions appeared to contain many of the conditions required to foster transformative learning.[25] The process evaluation also found that tutors were positive role models for students.[25] Empirical evidence has shown students can be more profoundly affected by role models than by formal coursework.[1] Positive role models can also help counter the effects of the hidden curriculum.[16,20]

While our results support the hypothesis that ethics is best taught in small groups, further testing, including testing in other settings, is required to establish its generalisability.

In Glasgow, ethics is subject to competing pressure for curricular time with a large number of other curricular themes, particularly in the more clinical years. While some of the main recommendations of the UK Consensus Statement on the organisation of clinical teaching in ethics and law have been implemented by the curriculum planners, full integration of ethics and law with the rest of the curriculum, particularly in the clinical years, may not have been achieved. Ethical decision making is an integral part of the clinical decision making process, and ethics teaching should be an integral component of clinical teaching.[1] As part of full integration, the UK Consensus Statement recommends that teaching in ethics and law should 'feature in students' clinical experiences, consistently forging links with good medical and surgical practice. Each clinical discipline should address ethical and legal issues of particular relevance.'[22] To help meet this aim it is recommended

that 'courses and workshops for teachers, including house officers, should be provided.'[22] Although training in ethics was provided for Vocational Studies tutors, tutors in the clinical years, house officers and specialist registrars involved in teaching did not receive any formal training. To help achieve integration we would recommend that ethics be addressed as part of a wider approach to professionalism,[26] with appropriate training being provided for all medical teachers involved in the curriculum.

While questions relating to ethics were included in the first and final MB examinations, they did not feature in the second or third. The General Medical Council[27] and the UK Consensus Statement[22] both recommend that ethics and law should be formally assessed as with all other core subjects within the curriculum. Changes in assessment task can produce marked changes in student learning behaviour.[28] The failure to include questions relating to ethics in these examinations may have detrimentally influenced students' learning behaviour, particularly where there is a strong examination-orientation among students.[25] Full integration would require assessment of ethics learning in all the MB examinations.

An interesting finding was the regression among the intercalating students on the whistle blowing vignette. The difference between these students and the students completing the EHCI post-Year 5 was that the intercalating students had completed a 1-year science curriculum in addition to 1 year of the 2-year clinical rotation. Post-Year 5 students had completed the clinical rotation. While the imminence of the final MB may have played a part in the difference in performance, perhaps the hidden curriculum of the science course had a greater negative influence than that of the medical curriculum with regard to whistle blowing. This is an area requiring further study.

CONCLUSIONS

This paper has implications for the future planning of ethics teaching in the University of Glasgow medical curriculum. While the structure and process of Year 1 appear to foster students' ethical development, the structure and process of the later curricular years seem to have had less impact on students' development. Small group teaching should be preferred to lecture and large group teaching throughout the curriculum. To promote effective small group ethics learning, tutors should encourage the conditions that promote

transformative learning. There should be full integration of ethics and law with the rest of the curriculum, particularly in the clinical years. This has training implications for all medical teachers involved in the curriculum. Assessment of ethics should be incorporated into every MB examination. The integration of ethics should be promoted as part of a wider approach to professionalism.

CONTRIBUTORS

JG conceived and designed the study, collected data, supervised data analysis and wrote the paper. LS and JM were involved in the conception and design of the study, and its ongoing management. They interpreted data and contributed to the writing of the paper. AMcC was responsible for data analysis and contributed to the writing of the paper.

ETHICAL APPROVAL

The University Ethics Committee at the University of Glasgow did not want to consider the study in 1996 when it started. Approval was obtained from the curriculum committee at that time.

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