

ORIGINAL ARTICLE

Differences in medical students' attitudes to academic misconduct and reported behaviour across the years—a questionnaire study

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Objectives: This study aimed to determine attitudinal and self reported behavioural variations between medical students in different years to scenarios involving academic misconduct.

Design: A cross-sectional study where students were given an anonymous questionnaire that asked about their attitudes to 14 scenarios describing a fictitious student engaging in acts of academic misconduct and asked them to report their own potential behaviour.

Setting: Dundee Medical School.

Participants: Undergraduate medical students from all five years of the course.

Method: Questionnaire survey.

Main measurements: Differences in medical students' attitudes to the 14 scenarios and their reported potential behaviour with regards to the scenarios in each of the years.

Results: For most of the scenarios there was no significant difference in the response between the years. Significant differences in the responses were found for some of the scenarios across the years, where a larger proportion of year one students regarded the scenario as wrong and would not engage in the behaviour, compared to other years. These scenarios included forging signatures, resubmitting work already completed for another part of the course, and falsifying patient information.

Conclusion: Observed differences between the years for some scenarios may reflect a change in students' attitudes and behaviour as they progress through the course. The results may be influenced by the educational experience of the students, both in terms of the learning environment and assessment methods used. These differences may draw attention to the potential but unintentional pressures placed on medical students to engage in academic misconduct. The importance of developing strategies to engender appropriate attitudes and behaviours at the undergraduate level must be recognised.

Medical education has undergone dramatic changes over the last decade. It has been recognised that traditional courses that encourage rote learning of facts, and primarily assess a student's knowledge, are not sufficient to equip medical students with the characteristics that will be expected of them in the future. These characteristics include good communication skills, competence in practical tasks, professionalism, appropriate attitudes and ethics, and an aptitude for personal development. The General Medical Council cite honesty and trustworthiness as important attributes of a medical practitioner.¹ In order to develop these characteristics many medical schools are implementing curricular revision. These revisions have not only altered what is expected of medical students but have also resulted in a change in methods of assessment. There are concerns that these assessment changes, combined with the pressures of the medical course, may provide more opportunity for, and even promote, academic misconduct among medical students.

Academic misconduct among the medical profession is an area of concern. It is important for doctors to be honest and trustworthy, as trust is a fundamental requirement for good relationships, both with patients and colleagues. It is also important for the profession to be able to rely on the validity of research, especially if they are to base changes in patient care on the findings of clinical trials. Fraud and plagiarism are problems that have been highlighted within undergraduate^{2–6} and postgraduate spheres.^{2–7–8}

It has been suggested that if students are dishonest at an undergraduate level they will continue to engage in dishonest behaviour as postgraduates.^{9–10} Dr Darsee, who fabricated a series of research papers at Harvard and Emory Universities as

a postgraduate, was also discovered to have fabricated published works as a medical student.^{11–12} Kalichman and Friedman found that if biomedical trainees reported previous misconduct in research they were twice as likely to consider engaging in unethical acts in the future than trainees who had not reported previous misconduct.¹³ A study looking at a business setting has also found a positive relationship between the acknowledgement of academic dishonest behaviour at an undergraduate level and dishonest behaviour in the work place.¹⁴

If a relationship exists between unethical behaviour at work and at undergraduate level, the attitudes and behaviours of undergraduates need to be explored. Initial analysis of this study (published in the *BMJ*) has shown that, in general medical students show high levels of integrity towards possible academic misconduct. High numbers of students have, however, expressed the view that some aspects of academic misconduct are not wrong and have reported engaging in these areas.¹⁵

This paper analyses the data in more depth, looking at differences in the responses of medical students by gender, and between the five years, in their attitudes to, and potential behaviours regarding, scenarios involving academic misconduct. The differences observed may draw to the attention of medical schools, the potential but unintentional pressures placed on medical students to engage in academic misconduct.

METHODS

At Dundee University Medical School, 676 medical students in all years received an anonymous questionnaire, though only

Table 1 Differences in attitudes to the scenarios between years. Students were asked whether they felt John was wrong

Scenario	Response	Per cent			
		Year 1	Year 2/3	Year 4	Year 5
1. John forges Dr Cloony's signature on a piece of work—for example, patient presentation, record of achievement. *p<0.001	Yes	98 (95.7 to 100.3)	98 (95.8 to 100.2)	82 (73.9 to 90.1)	84 (72.8 to 91.2)
	No	1 (-0.6 to 1.6)	1 (-0.5 to 1.5)	7 (1.6 to 12.4)	6 (0.3 to 11.7)
	Not sure	1 (-0.6 to 1.6)	1 (-0.5 to 1.5)	11 (4.4 to 17.6)	10 (4.2 to 19.8)
2. John copies answers in a degree exam from Jean.	Yes	99	98	97	100
	No	1	1	3	0
	Not sure	0	1	0	0
3. John chats to Jean about the OSCE Jean has just completed and John is about to go into.	Yes	32	45	55	42
	No	34	27	28	32
	Not sure	34	28	17	26
4. John copies from textbooks or published papers and lists them as references.	Yes	17	25	18	33
	No	55	54	67	52
	Not sure	28	21	15	15
5. John copies directly from textbooks or published papers without acknowledging the source.	Yes	84	82	82	78
	No	6	9	9	13
	Not sure	10	9	9	9
6. John copies Jean's work—for example, patient presentation, SSM report, case discussion.	Yes	90	93	92	90
	No	7	4	5	7
	Not sure	3	3	3	3
7. John lends Jean his work to look at, and she copies it without telling him.	Yes	26	32	30	37
	No	61	59	65	60
	Not sure	13	9	5	3
8. John lends Jean his work to copy.	Yes	55	59	66	77
	No	23	26	23	20
	Not sure	22	15	11	3
9. John writes a piece of work—for example, patient presentation etc for Jean.	Yes	79	83	82	86
	No	12	11	16	12
	Not sure	9	6	2	2
10. John writes "Nervous system examination—normal" in his patient presentation when he hasn't performed the procedure. *p<0.001	Yes	97 (94.2 to 99.8)	69 (61.7 to 76.3)	52 (41.5 to 62.5)	74 (62.4 to 83.6)
	No	1 (-0.6 to 1.6)	14 (8.5 to 19.5)	32 (22.2 to 41.8)	16 (7.2 to 24.8)
	Not sure	2 (-0.3 to 4.3)	17 (11.1 to 22.9)	16 (8.2 to 23.7)	10 (2.1 to 15.9)
11. John resubmits work already submitted for a different part of the course—for example, a SSM report for his fourth year project. *p<0.001	Yes	62 (54.1 to 69.9)	61 (53.2 to 68.8)	37 (26.8 to 47.2)	29 (18.1 to 39.1)
	No	17 (10.9 to 23.1)	23 (16.3 to 29.7)	46 (34.5 to 55.5)	54 (42.0 to 66.0)
	Not sure	21 (14.4 to 27.6)	16 (10.2 to 21.8)	17 (9.9 to 26.1)	17 (7.9 to 26.1)
12. John submits his thesis from a previous degree for his special study module. *p=0.007	Yes	29 (21.6 to 36.4)	56 (48.2 to 63.8)	46 (35.5 to 56.5)	45 (32.9 to 57.1)
	No	38 (30.1 to 45.9)	31 (23.7 to 38.3)	38 (27.8 to 48.2)	44 (31.9 to 56.1)
	Not sure	33 (25.4 to 40.6)	13 (7.7 to 18.3)	16 (8.3 to 23.7)	11 (3.4 to 18.6)
13. John submits work submitted the previous year by his senior.	Yes	91	95	91	94
	No	6	3	7	6
	Not sure	3	2	2	0
14. John and Jean submit the same SSM report. *p=0.002	Yes	75 (68.0 to 82.0)	59 (51.1 to 66.9)	58 (50.0 to 66.0)	68 (56.8 to 79.2)
	No	5 (1.5 to 8.5)	18 (11.9 to 24.1)	21 (12.3 to 29.7)	14 (5.6 to 22.4)
	Not sure	20 (13.5 to 26.5)	23 (16.3 to 29.7)	21 (12.3 to 29.7)	18 (8.7 to 27.3)

half of fourth year were present at the time of the study. The study was initiated, designed, and conducted by medical students who administered the questionnaire at the end of a lecture. The questionnaire included 14 scenarios in which "John", a fictitious student, engaged in academic misconduct regarding assessment. John forged signatures, cheated in exams, falsified patient information in assessment submissions, chatted to another student about an objective structured clinical exam that he, John, had just done and the other student was about to do, lent work to other students to look at, lent work to other students to copy, and plagiarised work.

The scenarios involving plagiarism were: copying other students' work; submitting the same special study module report

as another student; copying from a published text and not acknowledging the source; copying directly from published text and simply listing the source in a reference list; resubmitting work already submitted by himself or by others, and writing a piece of work for another student.

Students were asked whether they felt John was wrong and whether they had engaged in, or would consider engaging in, the behaviour described in the scenarios. (The opportunity to distinguish between "had engaged in" and "would consider engaging in" was not given to students.) A three point scale: "yes", "not sure" and "no", was used to record the student responses. The questionnaire included questions on gender, students' views on informing faculty about misconduct, and

Table 2 Differences between the years in reported behaviour to the scenarios. Students were asked: "Have you or would you consider doing it?"

Scenario	Response	Per cent			
		Year 1	Year2/3	Year 4	Year 5
1. John forges Dr Cloony's signature on a piece of work—for example, patient presentation, record of achievement. * p<0.001	Yes	0	3 (0.3 to 5.7)	12 (5.1 to 18.9)	37 (25.2 to 48.8)
	No	95 (91.5 to 98.5)	87 (81.8 to 92.2)	74 (64.7 to 83.3)	55 (42.5 to 67.2)
	Not sure	5 (1.5 to 8.5)	10 (5.3 to 14.7)	14 (6.7 to 21.3)	8 (1.4 to 14.6)
2. John copies answers in a degree exam from Jean.	Yes	1	4	0	3
	No	96	94	99	97
	Not sure	3	2	1	0
3. John chats to Jean about the OSCE Jean has just completed and John is about to go into.	Yes	32	25	37	32
	No	38	48	48	55
	Not sure	30	27	15	13
4. John copies from textbooks or published papers and lists them as references.	Yes	55	48	69	58
	No	19	29	23	32
	Not sure	26	23	8	10
5. John copies directly from textbooks or published papers without acknowledging the source.	Yes	10	11	16	24
	No	75	79	76	68
	Not sure	15	10	8	8
6. John copies Jean's work—for example, patient presentation, SSM report, case discussion.	Yes	1	7	9	11
	No	82	86	84	86
	Not sure	17	7	7	3
7. John lends Jean his work to look at, and she copies it without telling him. * p=0.003	Yes	41 (33.0 to 49.0)	32 (24.7 to 39.3)	31 (21.1 to 40.9)	25 (14.4 to 35.6)
	No	39 (31.1 to 46.9)	52 (44.2 to 59.8)	59 (48.5 to 69.5)	67 (55.5 to 78.5)
	Not sure	20 (13.5 to 26.5)	16 (10.3 to 21.7)	10 (3.6 to 16.4)	8 (1.4 to 14.6)
8. John lends Jean his work to copy.	Yes	22	24	28	22
	No	48	58	58	70
	Not sure	30	18	14	8
9. John writes a piece of work—for example, patient presentation etc for Jean.	Yes	7	8	9	15
	No	85	86	87	78
	Not sure	8	6	4	7
10. John writes "Nervous system examination—normal" in his patient presentation when he hasn't performed the procedure. * p<0.001	Yes	2 (-0.3 to 4.3)	45 (37.1 to 52.9)	54 (43.5 to 64.5)	40 (28.1 to 51.9)
	No	93 (88.9 to 97.1)	35 (27.4 to 42.6)	38 (27.7 to 48.3)	49 (36.8 to 61.2)
	Not sure	5 (1.5 to 8.5)	20 (13.7 to 26.3)	8 (2.3 to 13.7)	11 (3.4 to 18.6)
11. John resubmits work already submitted for a different part of the course—for example, a SSM report for his fourth year project. * p<0.001	Yes	12 (6.7 to 17.3)	17 (11.0 to 23.0)	16 (8.2 to 23.8)	43 (31.0 to 55.0)
	No	71 (63.6 to 78.4)	67 (59.5 to 74.5)	71 (61.4 to 80.6)	42 (30.0 to 54.0)
	Not sure	17 (10.9 to 23.1)	16 (10.2 to 21.8)	13 (5.9 to 20.1)	15 (6.3 to 23.7)
12. John submits his thesis from a previous degree for his special study module. * p<0.001	Yes	23 (16.2 to 29.8)	16 (10.2 to 21.8)	12 (5.1 to 18.9)	20 (10.2 to 29.8)
	No	47 (38.9 to 55.1)	69 (61.6 to 76.4)	75 (65.8 to 84.2)	67 (55.5 to 78.5)
	Not sure	30 (22.6 to 37.4)	15 (9.3 to 20.7)	13 (5.9 to 20.1)	13 (4.8 to 21.2)
13. John submits work submitted the previous year by his senior.	Yes	1	3	7	9
	No	95	95	91	89
	Not sure	4	2	2	2
14. John and Jean submit the same SSM report.	Yes	2	5	4	8
	No	89	81	80	81
	Not sure	9	14	16	11

signing a written declaration. The survey results were analysed using Statistical Package for Social Scientists for windows using percentage frequency responses with confidence intervals; differences between the years were analysed initially by the Kruskal Wallis H test. Mann Whitney U test was used to analyse gender and to compare differences between the years. p Values were calculated by correcting for ties, and to take into account the use of multiple significance tests, differences were classed as significant where $p < 0.01$. Confidence intervals were also calculated for data where a significant difference was noted between the years. The null

hypothesis was that there would be no difference in responses between the years.

The study looked at the potential impact of course delivery and assessment on the levels of academic misconduct. There are three distinct phases in the Dundee curriculum. Phase one is a preclinical year assessed primarily by invigilated exams. Phase two comprises years two and three and the educational experience of students is the same in respect to delivery and assessment. The core curriculum is assessed with written and clinical invigilated exams. Throughout phase three, years four and five, students build up a portfolio of work—a collection of

signatures certifying awareness, completion or competence in practical procedures, investigation and/or management, essays, projects, and patient presentations. Students have to submit a partially completed portfolio by the end of year four and are assessed by written and clinical invigilated exams. Year five is assessed solely by an oral that reviews the portfolio. Analysis of the results showed no significant difference in the responses between years two and three and as a consequence the data from these two years has been collapsed.

RESULTS

Four hundred and sixty one of the 676 (68%) students completed the questionnaire; 146 (88%) first years, 161 (57%) second and third years, 87 (83%) fourth years and 67 (55%) fifth years.

Student attitudes to the scenarios

For the majority of the scenarios, there was no significant difference in the attitudinal responses between the years. There was a significant difference in the attitudinal response for five scenarios (table 1). Three of these were very highly significant: forging a doctor's signature, resubmitting work for another part of the course, and writing "examination normal" when it hadn't been performed ($p < 0.001$). Two were highly significant: submitting the same special study module report as another student ($p = 0.002$) and submitting a previous thesis for a special study module report ($p = 0.007$).

For four of these scenarios (forging a doctor's signature, resubmitting work for another part of the course, writing "examination normal" when it hadn't been performed, and submitting the same special study module report as another student) the main difference seen was that more year one students felt the scenario was wrong and this proportion decreased in subsequent years of the course. In year five, however, there was an increase in the percentage of students who thought that writing "examination normal" when it hadn't been performed, was wrong.

In contrast to the previous scenarios, more year one students felt that submitting a thesis from a previous degree for an assessment was not wrong compared to year two and three students. This proportion then increased in the later years of the course.

Student behaviour in the scenarios

For the majority of the scenarios there was no significant difference between the years in the response of students to whether they had or would consider engaging in the behaviour described in the scenarios. There were significant differences between the responses of the years for five scenarios. Four of these were very highly significant: forging a doctor's signature on work; resubmitting work for another part of the course; writing "examination normal" when it hadn't been performed, and submitting a thesis for a special study module report ($p < 0.001$). One was highly significant: lending someone work to look at ($p = 0.003$) (see table 2).

For three scenarios, (forging a doctor's signature on work, resubmitting work for another part of the course, and writing "examination normal" when it hadn't been performed), the difference in student behaviour observed was for fewer of year one students to report that they had or would engage in the behaviour described in the scenarios, with increasing percentages of students engaging in the behaviour in later years. The increased proportion of students reporting that they had or would forge a doctor's signature on work and resubmit work for another part of the course was much greater in year five.

In contrast, the results for student behaviour in the scenario "writing examination normal when it hasn't been performed" show a slight reduction in the proportion of year five students reporting engaging in this.

Two scenarios did not follow the pattern seen between the years for the other scenarios. More year one students reported that they had or would consider submitting a thesis from a previous degree and that they would lend work for other students to look at, compared to the other years.

Gender differences

No significant gender differences were found for either the attitude or behavioural scenarios.

DISCUSSION

In the light of recent undergraduate curricula changes, the aim of this paper was to investigate whether the year of study influenced undergraduate medical students' attitudinal and behavioural responses to scenarios describing academic misconduct. For the majority of the scenarios there was no significant difference between the years in their attitude or whether they had or would consider engaging in the behaviour described in the scenario.

There was, however, a worrying difference for some of the scenarios where a greater proportion of year one students reported that the scenario was wrong and they would not indulge in the behaviour. The trend observed was for fewer students in the later years to consider the scenario to be wrong and for increased numbers to report that they had or would engage in the behaviour. These scenarios were: forging a doctor's signature on student work, writing "examination normal" when it had not been performed, and resubmitting work from another part of the course.

A study by Baldwin *et al* in 1996 of 2459 second year students in America found that females cheated significantly less than males in their educational settings prior to medical school. There was no significant difference, however, between the genders in their self reported cheating at medical school.¹⁶ Our results support Baldwin's study as no significant gender differences were found between the responses.

Higher integrity in year one in these areas may reflect greater honesty amongst entrants to medical school, a greater ignorance of the complexity of the issues, and/or the lack of experience or opportunity to engage in the scenarios. The differences in the educational experiences of the different years of students may be an influential factor in some of the differences observed.

There are marked differences in the types of assessment used across the years. Assessment of year one is primarily by invigilated end of term examinations and a special study module project; there is no requirement to gain signatures on work. The assessment system is the same in years two and three with an end of year examination and special study module work. A collection of written patient cases is also required, with these cases requiring the signature of a member of staff.

In addition to an end of year examination and a more extensive collection of patient cases, year four students have to start to gather signatures for practical procedures performed. Assessment forms, signed by a supervising doctor, for attachments and the completion of a special study module project, are also required. Assessment in year five is based solely on the portfolio of all documented activities carried out in years four and five. The portfolio is discussed with the student in a one hour oral examination.

In years four and five there may be increased pressure and opportunity for students to forge doctors' signatures on their work. Signatures are necessary to progress in the course and are often required from busy and unobtainable clinicians. The volume of signatures required and the perceived questionable value of some of the procedures requiring a signature may lead to the students devaluing the importance of the signature and may encourage dishonest behaviour.

The differences seen in the attitudinal and behavioural responses between the years for resubmitting a piece of work

from another part of the course may also reflect the move from more traditional exams seen in years one to four, to the increasing reliance in year five on producing a portfolio of work. Again, increased opportunity with suboptimal inspection of the work and lack of feedback prior to the end of year oral examination may result in the students feeling that their work is not valued. The lack of value placed on the work may demotivate students and encourage fraudulent behaviour.

The learning environment may also impact on the results: year one students are based on the main university campus with limited patient contact and no input into patient care. Students in years two to five are taught largely in the hospital or community medical setting; they interact more frequently with patients as they progress through these years. Students in year five spend time "shadowing" junior doctors and are often, under close supervision, directly involved in patient care.

Although students in year one have contact with patients, the concentration is on communication skills rather than physical examination of the patient. The response of year one students to writing "nervous system examination normal" when it had not been examined may reflect the lack of requirement to complete patient examinations. Without requirement and opportunity, the motivation to act inappropriately does not exist. A study of 683 American medical students also found that freshmen were more likely to view dishonest clinical behaviour, such as "writing that a physical examination finding was normal without checking the patient", as wrong compared to the senior students.¹⁷ The reversal of the trend, seen in our study, as students reach year five may reflect a greater involvement in patient care, the proximity of starting work as a junior doctor, and the realisation that what they write will soon have implications for patients.

The higher proportion of students feeling that submitting the same special study module report as another student was wrong in year one may indicate that better guidance is given to year one students regarding special study modules and may reflect the individual nature of the majority of special study modules completed in year one. The fine line between collaboration and collusion in small group work may be confusing for both staff and students. Collaboration has been defined as students "working together for mutual benefit, or towards an end product that is better than one achievable through individual work".¹⁸ Collusion can be considered to be the same as collaboration but with the intention to deceive an assessor as to the origins of the work.¹⁸ It should be made clear where, when, and how collaboration is acceptable and how collaborative work is assessed.

Although the main differences seen between the years were for more year one students to consider the scenario to be wrong and not to engage in the behaviours there were a few exceptions. These were lending work for other students to copy, and submitting a thesis from a previous degree.

The greater proportion of students in year one reporting engaging in lending work for other students to look at may reflect the need for year one students to share work in order to clarify requirements and to create a supportive network. It may also have been influenced by their interpretation of the scenario: they may be reporting that they have lent lecture notes to other students as opposed to work that may comprise assessment.

The differences in the attitudinal and behavioural responses for submitting a thesis from a previous degree may reflect the recent proximity of completion of a previous thesis by a proportion of year one students. The immediacy may heighten the awareness of these students to the possibility of using this work in part of the medical course. This finding may have implications if there is an increase in the number of postgraduate entrants to medical school.

The differences observed in this survey may be due to a variety of factors. This is a cross-sectional study. Variations

seen between years may be: due to the cohorts studied; a reflection of the attitudes and behaviours of the normal university population; a response to the medical school environment, or a gender bias because the student portrayed in the scenarios was male. It is unlikely that the differences seen in the responses between the years represent a true cohort effect due to the small time span of five years. Changes in society and student experiences over this time period would not impact on the results as dramatically as observed in this study.

It is possible that the increasing pressures on students as they progress through the course have influenced these results. The pressure may not only be extrinsic—increased course requirements to gain signatures and collect portfolio work, but also intrinsic pressure due to a potential feeling of greater loss if the student failed the course at the end rather than the beginning of the course. At the end of the course there may be a feeling that more is at stake. It has also been suggested that medical school actually dehumanises medical students¹⁹ and although moral reasoning may not be predictive of actual behaviour our data could be interpreted as supporting studies that have suggested that medical schools stunt student development in terms of moral reasoning.²⁰

Although moral reasoning is only one part of ethical behaviour, could it be that medical schools, instead of developing integrity and honesty in students, may inadvertently be promoting dishonesty and a lack of integrity? The concern is not only the engendering of inappropriate attitudes and behaviour at an undergraduate level but that these attitudes and behaviours may become inculcated into medical practice. These findings may be particularly timely considering the GMC's moves to revalidation and the use of portfolios as a possible tool of assessment.²¹ Hopefully the potential pitfalls identified through this study can inform others embarking on similar approaches.

Medical students, like doctors, have to be able to cope with pressure. Dundee University Medical School is currently developing and has implemented strategies, guided by results of the study, (1) to encourage honesty and integrity among medical students, (2) to provide an environment where these characteristics can flourish, (3) to ensure that opportunities and pressures to indulge in academic misconduct are minimised.

Currently, in the national arena, most strategies proposed to combat academic misconduct are aimed at postgraduate levels.^{7, 22, 23} The medical profession must consider the importance of developing strategies to encourage appropriate attitudes and behaviours at the undergraduate level. Further work is also being undertaken on the interpretation of the results of our study with the intention of developing a model to enable the consideration of, and to facilitate the development of, practical recommendations aimed at minimising academic misconduct.

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