Developing World Bioethics ISSN 1471-8731 (print); 1471-8847 (online) doi:10.1111/j.1471-8847.2007.00194.x

MISCONDUCT IN MEDICAL STUDENTS

JAIME VENGOECHEA, SOCORRO MORENO AND ALVARO RUIZ

Keywords
developing world,
duties,
education,
medical,
stress

ABSTRACT
Medical students, subject to unique challenges and stressors, frequently engage in misconduct. In this observational study, carried out in a medical school in Colombia, we developed a survey to explore the association between misconduct and stress, potential stressors and other possible contributing factors, such as sex, age and academic year. Of the 433 students that responded to our survey, 97.9% did not fully disagree with at least one of the mentioned misconducts and 99.8% admitted to at least one transgression. Based on a scale we developed, 61.4% of the students consistently agreed with misconduct and 44.9% frequently engaged in misconduct. A logistic regression model suggests that being male (OR 1.90, CI 95% 1.27–2.84) and stress (OR 1.04, CI 95% 1.01–1.06) may increase the likelihood of misconduct. In a subgroup of students, excluding those in their last year of studies, higher academic semester (OR 1.25, CI 95%: 1.10–1.42) may also be a risk factor for misconduct. Most of the observed variation in the data, however, is not explained by these factors. Other modifiers, such as student personality and sub-culture, may play a greater role in determining misconduct. The proportion of medical students that engage in misconduct is very high and warrants the attention of the medical education community.

INTRODUCTION

Medical students are subjected to academic, clinical and ethical challenges, particular to their professional training, which may have negative consequences directly affecting their health.[1] Students may modify the principles and values they held before beginning medical training.[2]

Stress is conceived as a response to the interaction between the individual (including his or her characteristics, capacities, interpretations and needs) and the demands of the environment he or she faces.

[1] L.M. Bellini. Variation of Mood and Empathy during Internship. *JAMA* 2002; 287: 3143–3146.

[2] S.C. Rennie & J.R. Rudland. Differences in Medical Students' Attitudes to Academic Misconduct and Reported Behaviour Across the Years – A Questionnaire Study. *J Med Ethics* 2003; 29: 97–102.

Address for correspondence: Jaime Vengoechea, MD, Carrera 11 #119-63 Apto 401, Bogotá, Colombia. jaimevengoechea@gmail.com; Socorro Moreno, MSc, Instructor, Epidemiology and Biostatistics Department, Pontificia Universidad Javeriana, Carrera 7 #40-62, Bogotá, Colombia. isabel.moreno@javeriana.edu.co

This response is affected by the subject's general appraisal of the environment, his or her coping skills, and the consequences of the perceived situation. Certain demands from the environment are recognized as causing stress; these include change or novelty, lack or overload of information, uncertainty, unpredictability, ambiguity and biological alterations, all of which may modify an individual's capacity to respond.[3]

As medical students advance in their studies, they face new stressors as commitment to patient's healthcare increases, work schedules become more demanding, and new coping skills need to be developed. Physicians suffer more stress than the general population.[4] Work strategies and work environment perception may change according to the stress felt by a physician.[5] One of the main determinants of how people perceive stress is personality: anxious personality would favor the development of stress, while optimism may prevent stress.[6] In a group of Thai medical students, exams where identified as the main source of stress,[7] and transitional periods were identified as especially stressful in a qualitative study in Birmingham.[8] In a cohort of Pennsylvania interns, high values of vigor, energy and empathy at the start of internship gave way in only three months to anger and depression, possibly due to fatigue and lack of energy. It has been suggested that stress increases as the medical student progresses in his or her courses, but this has not been proven conclusively.[9]

Medical students are constantly exposed to their patients' pain, suffering and death, which may lead to them developing a relative insensitivity towards these events; and they could potentially develop a similar insensitivity towards ethical and moral rules. A study carried out in Zagreb showed that 94% of medical students surveyed reported some sort of cheating, and the types of cheating increased from second to sixth year.[10] This tendency is similar to that reported by Rennie and Rudland at Dundee University, who found that a greater proportion of first year students clearly identified inappropriate behavior when compared to final year students.[11] The authors suggest that changes in learning environment, evaluation methods and unintentional pressure on students may lead to misconduct.

As these previous studies suggest, an association may exist between stress, defined by a state of psychological arousal to perceived threat, and the likelihood of misconduct. Many other factors may confound this association, including academic year, family or financial hardship, interpersonal relations, being away from home, and, most importantly, previous personality and moral perception.

In this study, we collected surveys from medical students in Bogotá, Colombia, South America between February and May 2005. Students in this medical school are usually in the upper-middle to higher socioeconomic classes. About 40% come from other major cities of the country, very rarely from rural areas. The remaining 60% are native to Bogotá. Despite some regional cultural differences, students tend to share the same urban Latin American culture, moral and religious values.

The surveys were collected with the intent of quantifying the amount of stress and misconduct among medical students. We also explored the possible association between misconduct and variables such as stress, semester, gender and potentially stressful situations. An institutional review board approved this study.

[3] F.J. Labrador & M. Crespo. 1994. Evaluación del Estrés. In *Evaluación Conductual Hoy: Un Enfoque Para el Cambio en Psicología Clínica y de la Salud.* R. Fernández-Ballesteros, ed. Madrid: Pirámide: 484–536; S. Lazarus. 1999. *Stress and Emotion*. New York, NY: Springer Publishing Inc.; S. Lazarus. 1993. Why We Should Think of Stress as a Subset of Emotion. In *Handbook of Stress: Theoretical and Clinical Aspects.* L. Goldberger & S. Breznitz, eds. New York, NY: The Free Press: 21–39.

[4] J. Firth-Cozens. Medical Student Stress. *Med Educ* 2001; 35: 6–7.

[5] I. McManus, A. Keeling & A. Paice. Stress, Burnout and Doctors' Attitudes to Work are Determined by Personality and Learning Style: A Twelve Year Longitudinal Study of UK Medical Graduates. *BMC Med* 2004; 2: 29.

[6] S.M. Stewart. A Prospective Analysis of Stress and Academic Performance in the First Two Years of Medical School. *Med Educ* 1999; 33: 243–250.

[7] R. Saipanish. Stress among Medical Students in a Thai School. *Med Teach* 2003; 25: 502–506.

[8] C. Radcliffe & H. Lester. Perceived Stress during Undergraduate Medical Training: A Qualitative Study. *Med Educ* 2003; 37: 32–38.

[9] Bellini, *op. cit.* note 1.

[10] M. Hrabak. Academic Misconduct among Medical Students in a Post-communist Country. *Med Educ* 2004; 38: 276–285.

[11] Rennie & Rudland, *op. cit.* note 2.

Table 1. Potentially Stressful Factors

	Mean Score* (Standard Deviation)			
	Total (including 11th and 12th semesters)		Total (excluding 11th and 12th semesters)	
ITEM	Female	Male	Female	Male
Academic work	7.1 (2.0)	6.4 (2.2)	7.2 (2.1)	6.7 (2.0)
Competition with classmates	4.0 (2.6)	3.9 (2.8)	3.9 (2.6)	4.1 (2.8)
Lack of academic orientation	4.9 (2.8)	4.9 (2.9)	4.9 (2.7)	4.9 (2.9)
Use of drugs and alcohol	0.8 (1.7)	0.8 (1.7)	0.8 (1.7)	1.7 (2.4)
Difficulties in sexual relationships	1.1 (2.0)	1.1 (2.0)	1.3 (2.1)	2.0 (2.8)
Difficulties maintaining sleep	3.1 (3.4)	3.1 (3.4)	3.2 (3.4)	3.7 (3.6)
Difficulties in family relationships	3.3 (3.2)	3.3 (3.2)	3.5 (3.2)	3.4 (3.2)
Lack of time for recreation	6.5 (2.7)	6.5 (2.7)	6.6 (2.7)	6.3 (3.0)
Loneliness or isolation	3.5 (3.3)	3.5 (3.3)	3.6 (3.3)	3.7 (3.2)
Difficulties in personal relationships	2.9 (3.0)	2.9 (3.0)	3.0 (3.0)	3.4 (3.1)
Financial problems	4.1 (3.4)	4.1 (3.4)	4.1 (3.4)	4.4 (3.5)
Living away from home	1.6 (2.8)	1.6 (2.8)	1.5 (2.7)	1.4 (2.6)

* Scored by student according to scale: 0 = not stressful, 10 = extremely stressful.

METHOD

The study was carried out in a medical school that usually accepts 120 students for first semester training directly from high school or through a six-month 'pre-med' program. The Medicine program is divided into 12 semesters and students are exposed to clinical situations starting in the fifth semester. We only included students in clinical training, as stressors during basic and clinical training tend to be of a different nature, and students in their later years can display misconduct in a wider range of situations.

We developed a survey divided into five parts. In Part 1 we asked demographic questions: gender, age and current academic semester. For Part 2 we included questions on potentially stressful factors (Table 1), to be discretely scored from 0 to 10. These questions were selected by a focus group of final-semester medical students, and all their suggested stressors were included. In Part 3 we used the 'Perceived Stress Scale' validated by Remor & Carrobles (in Spanish).[12] We developed a scale to measure approval of examples of misconduct (Part 4) and another for actual misconduct (Part 5). Table 2 shows the questions included for these scales. These questions were agreed by a focus group of final-semester students. In the form presented to the students, we included some 'filler' questions to mask those seeking information about misconduct.

A final-semester student, a member of the study group, approached students after a compulsory attendance activity – such as after an important lecture or a minor test – where they would be provided ample time to answer the survey in private, and used a pre-prepared script to explain the nature of the survey in general terms without explicitly mentioning misconduct. Students would first give informed consent by filling and signing a form according to Colombian legal standards, with the opportunity to reject participation. Students in the last two semesters were either mailed the questionnaire and instructions script or approached in small groups as there were no compulsory-assistance activities including all students. Regardless of the method used, the survey remained anonymous and separate from the informed consent form. A total of 433 students – out of 541– answered the survey and 11 students refused consent. Only six of the 32 mailed surveys were returned.

Data were analyzed by obtaining means or proportions for Part 1, proportions for Part 2, and total score for Part 3. For Parts 4 and 5, we classified students into misconduct or no-misconduct groups, according to previously established scoring criteria (shown in Table 4). Using Stata 8.0, we ran a logistic regression model including data from all survey parts; we removed variables with $p > 0.2$ and then

[12] E. Remor & J.A. Carrobles. Versión Española de la Escala de Estrés Percibido (PSS-14): Estudio Psicométrico en una Muestra VIH+. *Ansiedad y Estrés* 2001; 7: 195–201.

Table 2. Misconduct Questions

	All students (including 11th and 12th)		*Excluding 11th and 12th semester*	
ITEM	*% approves**	*% admits***	*% approves**	*% admits***
Copying from another in an exam	27.0	60.3	25.8	59.1
Copying literally from published books or articles	65.8	74.0	65.7	75.2
Lending work to another so he/she may copy	70.2	86.6	68.7	85.5
Using downloaded material without reference	63.0	65.3	62.6	65.7
Writing the heart rate in a medical chart without taking it	44.7	59.3	44.2	57.7
Leaving the hospital during a shift	74.0	53.4	75.3	52.3
Presenting work with the name of someone who did not participate in it	67.2	75.4	68.7	78.0
Paying someone to do a shift for you	70.0	11.1	67.3	8.4
Obtaining a copy of a test before presenting it	26.7	10.7	25.3	9.8
Asking someone to include you in the assistance list	79.0	70.9	79.7	71.6
Answering 'negative' if asked about patient past history you did not obtain	45.4	55.9	44.5	54.9
Paying someone to change a grade	5.6	1.4	5.2	1.4

* Scored 'No' if marked: 'disagree', scored 'Yes' if marked 'partially disagree', 'agree in special cases', 'partially agree' or 'agree'.
** Scored 'No' if marked 'never', scored 'Yes' if marked 'rarely', 'sometimes', 'frequently' or 'very frequently'.

Table 3. Population Characteristics and Percentage Response to the Survey

Semester	Women	Men	Total responders	Total students in semester	% response
5	42	33	75	100	75
6	46	27	73	75	97
7	32	29	61	62	98
8	26	28	54	61	89
9	35	22	57	64	89
10	24	23	47	67	70
11	13	14	27	50	54
12	20	19	39	62*	63
Total (including 11 and 12)	238 (55.0%)	195 (45.0%)	433	541	80
Total (excluding 11 and 12)	205	162	367	429	86

Percentage response was determined by dividing total responders by total students.
* Excludes 4 students involved in preparing and administering the questionnaire.

ran a stepwise reverse model, finally retaining variables with $p < 0.05$.

RESULTS

Table 3 includes the characteristics of the surveyed population, and the response rates according to semester. We had difficulties obtaining surveys from the eleventh and twelfth semesters as the students in these classes are rarely assembled together. Table 4 shows, according to semester and gender, the scores in Parts 3–5 of the survey. In our cohort, 97.9% of students did not fully disagree with at least one of the mentioned misconducts, and 99.8% admitted having engaged in misconduct at least once (Table 4). After we applied the previously established scoring system, 61.4% of students fell into the 'misconduct' category for Part 4 and 44.9% for Part 5. We found smaller proportions in the last two semesters, suggesting the possibility of a selection bias (i.e. students prone to misconduct did not answer the survey, while those who were relatively well-behaved did). Due to this possibility, all tables display the results twice: including all students, and excluding the last two semesters.

Tables 5a and 5b show the variables that proved significant at a $p < 0.05$ level in the logistic regression models, divided into two groups: all students, and fifth to tenth semester students. It must be noted that the R^2, a measure of how much variation is explained by the model, was very low for all models. This in no way limits the validity of the models, but highlights the fact that other factors, not covered

*Table 4. Perceived Stress Scale (PSS) Score: Mean (Standard Deviation) and Percentage in Misconduct Group for Parts 4 and 5**

	*Stress score***		*Agrees with misconduct (Part 4)*		*Engages in misconduct (Part 5)*	
Semester	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*
5	31 (7.3)	26 (8.8)	43.9	42.4	39.0	36.4
6	25.4 (6.6)	20.8 (8.4)	50.0	81.5	24.4	52.0
7	23.5 (7.3)	23.8 (7.7)	62.5	69.0	38.7	57.1
8	27.7 (7.7)	26.0 (8.0)	56.0	57.1	34.6	42.9
9	26.5 (6.4)	26.7 (7.2)	61.7	81.8	51.5	59.1
10	22.5 (5.9)	20.5 (7.2)	66.7	91.3	43.5	82.6
11	26.3 (8.6)	20.6 (7.3)	53.8	64.2	41.7	57.1
12	21.5 (7.1)	19 (6.7)	65.0	42.0	30.0	16.7
Total (including 11 and 12)	26.0 (7.5)	23.3 (8.2)	56.2	65.6	37.2	50.3
Total (excluding 11 and 12)	26.4 (7.4)	24.0 (8.2)	55.5	68.5	37.7	53.5

* Scoring system for Parts 4 and 5:
For Part 4 – *Mark how much you AGREE with the following situations?* Students had the option of marking: 'disagree' (scored 0), 'partially disagree' (scored 0), 'agree in special cases' (score 1), 'partially agree' (score 7) or 'agree' (score 7).
For Part 5 – *How frequently have you done/do you do the following activities?* Students could mark 'never' (scored 0), 'rarely' (scored 0), 'sometimes' (scored 1), 'frequently' (scored 7), 'very frequently' (scored 7). We added the score over the 12 questions for each part, and if the score was greater than or equal to 7, the survey would be classified in the 'misconduct' group.
** PSS score determined according to scoring instructions described by Remor & Carrobles.
Total that did not fully disagree with at least one of the mentioned misconducts = 97.91% (98.08% when excluding the last two semesters).
Total that admitted having engaged in misconduct at least once = 99.76% (99.72% when excluding the last two semesters).

Table 5a. Logistic Regression for Part 4. 'Mark how much you AGREE with the following situations?'

All Semesters (including 11th and 12th)			
Subjects: 427		Goodness-of-fit: chi^2 (9) = 6.25 p = 0.7151 – for lack of fit	
Psuedo-R2: 0.0078			
Variable	*OR*	*Confidence interval (95%)*	*P Value*
Use of drugs and alcohol	1.115	1.005–1.238	0.04
5th to 10th semester			
Subjects: 361		Goodness-of-fit: chi^2 (9) = 13.97 p = 0.1233	
Psuedo-R2: 0.04			
Variable	*OR*	*Confidence interval (95%)*	*P Value*
Male gender	1.69	1.08–2.63	0.02
Semester	1.27	1.11–1.45	<0.001

Table 5b. Logistic Regression Model for Questions in Part 5. 'How frequently have you done/do you do the following activities?'

All Semesters (including 11th and 12th)			
Subjects: 419		Goodness-of-fit: chi^2 (73) = 57.43 p = 0.9094	
Psuedo-R2: 0.03			
Variable	*OR*	*Confidence interval (95%)*	*P Value*
PSS Score (Stress)	1.04	1.01–1.06	0.002
Male gender	1.90	1.27–2.84	0.002
5th to 10th semester			
Subjects: 355		Goodness-of-fit: chi^2 (214) = 219.4 p = 0.3855	
Psuedo-R2: 0.053			
Variable	*OR*	*Confidence interval (95%)*	*P Value*
PSS Score (Stress)	1.04	1.01–1.07	0.005
Male gender	2.06	1.32–3.21	0.001
Semester	1.25	1.10–1.42	0.001

by the survey, have great importance in explaining misconduct.

DISCUSSION

This being a survey based study, obtaining a high response rate is very important to reduce the possibility of selection bias, as there may be systematic differences between responders and non-responders. We strived to obtain surveys during activities with compulsory attendance, but for two groups, namely eleventh and twelfth semester, this was not possible. Our results reflect this reduced response rate, with considerably lower levels of reported misconduct in those semesters. It may be true that last year students are more mature and less likely to engage in misconduct. However, we believe this to be an unlikely explanation, as other studies have found final year students have the greatest likelihood of misconduct. Regarding the students in this study, past misconduct would have been reflected in their answers to Part 5, which were framed in both the past and present tense.

Students reported academic work and lack of time for recreation as the most important sources of stress. These two are linked to one another and were important stressors found in previous studies.[13] Efforts aimed at strengthening coping skills among studies targeted at these inevitable stressors may impact overall stress. Competition with classmates rated relatively high; this could be addressed by discouraging head-to-head comparison and competition in general. We included a mixture of less and more serious transgressions in our questionnaire, believing the latter would have very low frequencies. Yet, 27% of responders did not reject obtaining a copy of an exam before taking the exam (a blatant misconduct); and 11% admitted to such misbehavior. Regarding copying during the test, 27% approved of this conduct, but a highly significant 60% admitted having copied during a test. With respect to handing-in work, the students proved even less trustworthy: over 65% have literally copied from published work, have lent their paper to someone else so he or she may copy from it, have downloaded work from the Internet, or have presented a paper including the name of someone who did not actually work on it. Regarding patient-oriented work, 59% have written down a heart rate they have not taken. Although 70% of students agree to a certain degree with paying someone to work his or her shift, only 11% have actually done so. The explanation may be found in what a student – ignoring the instructions – wrote on the survey: '. . . because I do not have the money'. These are a few examples of what must be considered alarming results. What should we think of the 6% that agree with paying someone to modify their grade?

Latin American societies, regretfully, have a habit of 'letting go' small deceits. This may be reflected in our results. Also, a culture has developed within the student group where certain behavior is considered normal, like lending papers. Copying during tests is tacitly approved, as many just laugh when they see their classmates and future colleagues copying. There may be excessive pressure applied on medical students – as compared to other college students – but we would have to make comparisons between students in different programs, which went beyond the scope of our work.

Medical students in Colombia are expected to rapidly achieve a considerable degree of independence, as patient care in many public institutions relies on little-supervised trainees. Most medical graduates in Colombia will not pursue further training (e.g. a residency) and will rely exclusively on the skills obtained in medical school. If, as our results suggest, a high number of trainees are lying about cardiac frequencies, it is not unreasonable to suggest many current physicians lie in other clinical history information. The fact that they went unpunished during training only enhances the chances they will continue such behavior as physicians.

If students cheat on their tests or use illegal means to improve their grades, the objective measures of student performance that universities use to decide on granting a diploma, and that employers rely upon when deciding whether to hire a physician, may be misleading. Many patients may be entrusting their health to under-prepared physicians who cheated during medical school to disguise their lack of clinical knowledge. This is not to suggest that every student that once downloaded a paragraph from the Internet

[13] McManus et al., *op. cit.* note 5; Saipanish et al., *op. cit.* note 7.

will be a poor physician, but the 11% who were willing and able to pay others to work shifts for them may be more likely to evade their on-call responsibilities as physicians. The overall quality of healthcare may be improved if particular determinants of student misconduct are addressed.

The logistic regression model showed that misconduct does increase with stress, semester and being male. However, we must be careful in our interpretation of these results, as our high prevalence of misconduct may allow us to find very small effects. R^2, which measures how much misconduct is explained by the models, was low, reflecting this difficulty. The factors we surveyed may not be the most important determinants of stress, and future research could focus on whether anxious personality, lack of tolerance to frustration, and decreased coping ability ('hardiness') relate to misconduct.

CONCLUSIONS

Nearly all surveyed medical students admitted engaging in misconduct at least once. Our survey showed that some candidate factors, such as gender, academic semester and stress, have a relatively small impact on cheating. This study does not reveal a single determinant with a large impact on misconduct; finding one may help medical schools address this worrisome problem. This is required due to the special trust society will deposit on future physicians: its health.