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Does ragging play a role in medical student depression – cause or effect?

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Abstract

Background—Medical students have depressive symptoms rates different than the general population. In this study we set out to look at which are the environmental factors related to one medical school in Brazil that could be correlated with these symptoms.

Methods—We assessed depressive symptoms using Beck's Depression Inventory. 465 and 267 students were recruited in 2001 and 2006 respectively. We explored possible social and environmental causes using a small group of qualitative data.

Results—Nearly 15% scored above the cut off for the threshold in the two samples. Males who were in the pre-clinical stage in 2006 had a trend of increase in depressive symptoms than males in the same cycle in 2001 (aOR= 7.36 [95%CI= 0.85-63.5] p=0.07). Qualitative data confirmed that factors such as ragging and low social involvement were correlated with depressive symptoms in pre-clinical stage males.

Limitations—Low response rates especially in the latter groups may affect the findings. Dropout students were not accessed. We also had very limited number of interviews as resources did not permit more detailed exploration with larger number of teachers and students in the qualitative study.

Conclusions—Despite the correlation between ragging and depressive symptoms, none causal relationship could be done. Future qualitative and quantitative research on this topic is needed. The correlation of depression with low social involvement was already described in other studies.

Keywords

Depression; medical student; hazing; social involvement; gender

Introduction

Medical students have shown higher rates of depression compared with general population (Dahlin et al, 2005, Levine et al, 2006, Clark & Zedlow, 1988, Dyrbie et al, 2006). These higher rates have been attributed to environmental factors, such as stress, and the rigors of the medical curriculum (Dahlin et al, 2005, Dyrbie et al, 2006, Smith et al, 2007). It has been argued that modifications in the curriculum will improve mental health of medical students (Hassed et al, 2009, Holm et al, 2010). However, in spite of high rates of psychological disorders, there is no consensus on which is the period of greatest stress during the medical education, or the causative factors for such high rates (Dyrbie et al, 2006).

Dyrbie *et al.* (2006) indicated that medical school itself, regardless of culture, generates a level of stress which may contribute to poor mental health. These symptoms are often severe enough to cause clinical symptoms (Dahlin et al, 2005), worsen the quality of life (Hassed et al, 2009) and trigger suicidal thoughts (Alexandrino-Silva et al, 2009) in these students. Similar findings have emerged from Europe (Dahlin et al, 2005, Guthrie et al, 1988) and the US (Levine et al, 2006, Clark & Zedlow, 1988, Dyrbie et al, 2006b). These differences in rates and findings may be due to differences in curriculum and duration of the course (Gross et al, 2008), gender (Goebert et al, 2009), duration of the internship (Santos Ide et al, 2009), and contact with cadavers in anatomy classes (Madill & Latchford, 2005, Sugand et al, 2010). A cross-sectional study (Dahlin et al, 2005) of Swedish medical students in their first, third and sixth year (n = 342) reported that, overall, 12.9% had depressive symptoms in the previous two weeks (higher prevalence in women – 16.1%), which is significantly higher than the general population which in the US varies between 5.9% and 7.2% (Williams et al, 2007). Levine et al (2006) found from two classes during the first two years of medical school a statistically significant increase in Beck Depression Inventory (BDI) scores in the moderate and severe range from 5.1% to 5.8% and from 10.5% to 11.9% at the end of the second year. Dyrbie et al, (2006b) in a study within three medical schools in Minnesota (U.S.) reported that the frequency of burnout increased throughout the years of medical school. Similar high rates have been reported from countries like China (Stewart et al, 1995) and Turkey (Aktekin et al, 2001). A recent cohort showed a marked increase in depressive symptoms during medical internship (Sen et al, 2010). Baldassin *et al.* (2008), found a higher prevalence of depressive symptoms in women as compared to men during their internship.

But why do the medical students have different rates of depression compared to the general population? Of course, depression is caused by multiple factors including genetic and environment factors (Mill & Petronis, 2007). In some types of severe depression genetic and environmental factors appear to be better predictors than other models (Gorwood, 2009). Life-stress seems to be the most studied in recent years (Monroe & Reid, 2008). One issue that deserves further detailed exploration is how the environment of medical schools, which should be modifiable, may influence the depressive symptoms in this population.

There is some evidence that some social aspect could be involved on it. In a small cross-sectional study (Rab et al, 2008) (n= 7) with Pakistani medical students, being female, living in university dorms, experiencing adverse life events, and having fewer friends were all associated with depression. Aktekin et al (2001) found that inadequate social activity (which may be related to the number of friends as described in the work of Rab et al (2008) may lead to development of psychological symptoms. Among protective factors religion is very important even among medical students as shown in a study from Iran particularly (Vasegh & Mohhamadi, 2007).

Considering all these statements, we decided to study correlation of changes in depression using two cross-sectional studies 6 years apart and longitudinal changes related to this medical school environment, if any.

Methods

Quantitative Study

Ethical Approval—This study was approved by the local Ethics in Research Committee.

Sample—The sample consisted of first- to sixth-year medical students of whom 465 were assessed in 2001 and 267 in 2006. Basic socio-demographic data are shown in Table 1. The students were divided into three broad classes: preclinical studies (anatomy, histology, biochemistry, cell biology, physiology, among others), early clinical studies in internal medicine, infectious diseases, surgery, gynecology, pediatrics, psychiatry, among others and thirdly internship phase (equivalent to house jobs or Foundation year 1 in the UK),

In 2001, 603 medical students were enrolled were eligible to participate in this study. Of the 603 students, 465 completed the questionnaire (77.1%). 157 were in pre-clinical stage, 163 in clinical stage and 145 were doing their internship.

2006 study also had 603 medical students eligible and were approached to participate in the study. Response rate for this group was lower - only 267 individuals (44.2%) completed the study. Of these 149 were in the pre-clinical stage, 68 in the clinical stage and 50 in the internship stage.

Assessment—We decided to use Portuguese version of Beck's Depression Inventory version 1 (Beck et al, 1961). Portuguese version has been validated (Gorestein & Andrade, 1996). The BDI is a self-completion questionnaire of 21 items. The individual can score each item from 0 to 7 and may have an end result of 0 to 63 points. We adopted the cut-off scores proposed by Kendall et al (1997) for nonclinical populations - scores higher than 15 as detecting dysphoria, and scores over 20 as indicative of depression. Following the usual norms we decided to divide students into two groups according to their BDI scores. Scores of 0-15 were considered normal, those with scores above 15 were placed in the dysphoria/depression group.

The respondents were assured of total anonymity and confidentiality and were asked to provide basic socio-demographic details.

Statistical Analyses—Initially, we used chi-square tests to evaluate differences in BDI scores (normal, dysphoric/depressed) between students interviewed in 2001 and 2006. As this is a cross-cohort study, the analysis was performed by comparing the sub-samples from each education phase (pre-clinical, clinical and internship) and between 2001 and 2006 samples. Subsequently the data stratified by gender (male and female) and by age (younger and older age groups) from the corresponding 2001 and 2006 sub-groups were compared. This step was followed by running regression models for all sub-groups across 2001 and 2006. We compared by gender (with age as a covariate) and age group (with gender as a covariate). The results were analyzed using the Statistical Package for Social Sciences (SPSS, version 18.0). Comparisons between 2001 and 2006 total samples were not possible since 2001 first-year students were the 2006 sixth-year students.

Qualitative Study

Sample—We felt that some qualitative validation was essential to understand the differences and also explore possible environmental factors. We therefore selected four key informants who had major roles in medical education during the period of 2001-2006, including: a professor (Coordinator of the Medical School in the period of 2001-2006), course coordinator and two student leaders who all had significant roles in the curriculum delivery and in both athletic and curricular student events. Further corroborative information was gathered from the coordinator who had conducted a study exploring curriculum changes. Minorities were not represented since these groups do not have access to private medical school like that in Brazil.

Interviews—Three of the authors developed exploratory questions for the interviews with each of the four key informants. In particular the questions focused on environmental changes in the medical school over the 5 year period with exploration of their experiences in this regard. A degree of triangulation was thus achieved. These questions contained sub-items that triggered responses relevant to the main aspects of this study. Interviews were conducted by one of the authors (MPM) and lasted about 40 minutes. The responses were recorded and contemporaneous notes were kept.

Analyses—The interview comments were divided into themes and subthemes using content and thematic analyses (Table 3). As before, these results were also stratified for the pre-clinical, clinical and internship stages.

Results

Quantitative Study

Table 2 highlights the distribution of individuals by age and their BDI score and shows the chi-square and binary regression comparisons.

Pre-Clinical Stage—Most of the respondents (306/732, 41.8%,) were from this group. This group included 157 and 149 respondents, respectively from 2001 and 2006. We did not find any differences in the BDI scores between the two sub-samples (2006 versus 2001, $p = 0.86$). However, when stratified by gender, chi-square comparisons showed that there were more males with depression and dysphoria in 2006 compared to 2001 ($p = 0.052$). Results from the binary regression model also demonstrated a trend for significance (aOR = 7.36 [95% CI = 0.85-63.18] $p = 0.07$) when comparing BDI scores in males in 2006 versus 2001. Among females, there were no significant differences despite a large sample size ($n = 201$).

Clinical Stage—There were no statistically significant differences in BDI scores when comparing the 2006 to the 2001 in this phase ($p = 0.81$). There were no differences in depressive symptoms among females in 2006 versus 2001 ($p = 0.60$). Male gender analyses did not show any differences either but the 2006 sample is relatively small.

Internship Stage—This stage had a small number of respondents ($n = 50$ in 2006 and $n = 145$ in 2001). Again, there was no statistically significant difference in BDI scores between the years ($p > 0.1$) in the initial comparison. Among the sub-groups, there was a larger sub-sample of younger women than younger men (121 versus 74), But no difference was found within these groups in 2001 versus 2006 in terms of depressive symptoms ($p > 0.1$ in all comparisons). For the different age groups, the younger students were a very small sample in 2006 ($n = 5$).

Qualitative Study

The relevant information of the qualitative study and its interpretations are shown in Table 3.

Curriculum—There were changes in the curriculum like the reduction in workload through the optimization of time with more efficient classes and the exclusion of non-core content, the removal of Saturday activities and the creation of a free time period one afternoon per week, during which the student is able to invest his time as he wishes. Student respondents confirmed the changes especially acknowledging introduction of new elective disciplines as part of the changed curriculum. These changes occurred in the clinical and internship stages. These changes were seen as positive change in the environment during the evaluated period (2001-2006) along with an increase in grants and teacher support.

Ragging among medical students (RAMS)—Most medical schools have the process of ‘welcoming’ new students by their seniors as ragging or hazing. This generally lasts for the first few weeks or months and involves physical or verbal bullying of the freshers. The professors pointed out that over the 5 years under study ragging had worsened. One of the students interviewed confirmed that that was indeed the case and in 2006 at least on one occasion police had become involved.

In terms of dealing with ragging, there was a consensus among interviewees that the matter was generally ignored and no action taken until 2002. Furthermore, since 2006 students who refused to participate in RAMS rituals were segregated and prevented from participating in other students activities. This situation shows how RAMS were incorporated in the medical school atmosphere and how it increased during 2001-2006 period. Beginning students who refused to participate in RAMS had to live apart of the other students.

Infrastructure—The informants added that during the 5 year period there were many improvements in infrastructure such as incorporation of a new hospital, which contributed to a sense of growth and contributed to greater social contact among students. In addition students were better supported by more athletic facilities, more coaches, and other sports facilities. The academic facilities also improved leading to greater student involvement in the affairs of the medical school.

Student Involvement in Social Activities (SISA)—An overall reduction in the amount of people at on-campus parties (which involved only the medical students) was reported. The “drums test”, which occurs on most Fridays of the year - and could be considered a party as the students play drums, listen to music and consume beverages - was considered a major part in the social life of the students. It can be understood as a decrease in SISA.

Discussion

The main finding of this study shows a variation in the distribution of BDI scores among medical students in the especially males in the pre-clinical stage in one medical school in Brazil and its correlation with the qualitative findings. Higher levels of depression and dysphoria were found in males in the sample in 2006 in comparison with 2001 reaching statistical significance ($p = 0.052$), further confirmed as a trend in the binary regression model (aOR 7.36 [95% CI 0.85-63.5] $p = 0.07$). Interestingly, higher ragging and lower social involvement were found as environmental changes in the pre-clinical stage from 2001 to 2006 and we postulate that they are correlated with higher levels of depressive symptoms.

Ragging is any disorderly conduct that has the effect of teasing or handling with rudeness any student, which causes or is likely to cause annoyance, harm or to raise fear in a junior so as to adversely affect the psyche of the junior. Ragging is practiced all over the world, with different nomenclature like hazing, fagging; bapteme in French; doop in Dutch; and Mopokaste in Finnish (Garg, 2009). RAMS prevalence is unknown but in some countries like India it has been called attention by the authorities (Malhotra, 2010). RAMS was evaluated in a cross-sectional study in Brazil which analyzed 149 medical students (Marin et al, 2008) and not surprisingly there were key differences between two sexes. Males are generally ragged more and also perhaps more aggressively which may mean that ragging is a significant stressor and an etiological factor in males but this needs to be explored further.

The decline in SISA was also correlated with increase in depressive symptoms. This finding was expected since there some studies on social involvement & medical students and social involvement & depression. It is known that medical students have social lives that are isolated from other students (Blakey et al, 2008). By and large they are said to confine their social activities restricted to classmates, and that the difficulty of making friends has been linked to the presence of a common mental disorder (Lima et al, 2006). We know that inadequate social activities (Aktekin et al, 2001) and limited number of friends (Rab et al, 2008) lead to depressive symptoms which may well be happening here in this population.

We propose that RAMS may be correlated to increased levels of depressive symptoms and dysphoria but we could not investigate any kind of causal relationship in the present study. In order to test this hypothesis future research are needed. Qualitative studies could be interesting for this aim since medical students that had depression during the college period – and their relative, partners and classmate – could be interviewed to evaluate whether they suffered any type of ragging and if it occurred before or after the onset of depressive symptoms. In other hand, certainly more detailed quantitative analysis with larger numbers across different medical schools and different years from entry to graduation and internships exploring individual and collective impact of ragging (hazing) are crucial. Relevant interventions can be put in place for improving medical student depressive symptoms and functioning. Have anti-ragging campaigns in a medical school any impact on depressive symptoms? Do the treatment of medical students depression in specialized academic services affects ragging rituals or effects in this environment?

Academic stress (Ahmed et al, 2009) and the rigorous curriculum (Smith et al, 2007) of medical students are also recognized as stressors, and interventions to improve these situations have been evaluated (Zijdembos et al, 2010). These inherent aspects of medical school have been linked to the production of depressive symptoms in other studies (Smith et al, 2007, Ahmed et al, 2009). However, in the present study, perceived positive changes in the context of curricular structures were not found to affect the distribution of BDI scores between the 2001 and 2006. Elective posts were also added to the internship phase, as was a course in medical emergencies as part of major curriculum change, without any statistically significant changes in our descriptive and regression analyses.

Limitations

Our study has some major limitations which need to be remembered. Firstly these were self-assessments and no clinical assessment was conducted to confirm whether students did have depression so we need to see this as prevalence of symptoms only. The numbers are relatively small and focus on only one medical school. Low response rates especially in the latter groups may affect the findings. We did not access the students that drop out of medical school who probably had higher level of depressive symptoms (Dyrbie et al, 2011). We also had very limited number of interviews as resources did not permit more detailed exploration

with larger number of teachers and students. Future studies must explore larger numbers to confirm the quantitative findings.

Conclusion

These findings indicate that some features of the medical school environment, such as RAMS and the SISA (like parties), may have correlation with depressive symptoms in students during this period. These two topics can influence males more than females and perhaps those who are younger.

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Table 1

Medical School sample distribution per stage by gender and age, 2001 and 2006 data (Quantitative Study).

	2001 Sample (n = 465)				2006 Sample (n = 267)				
	Male	Female	Younger	Older	Male	Female	Younger	Older	Total
<i>Pre-Clinical Stage</i>	55 35.0%	102 65.0%	39 24.8%	118 75.2%	50 33.6%	99 66.4%	19 12.8%	130 87.2%	306
<i>Clinical Stage</i>	71 43.6%	92 56.4%	45 38.1%	118 61.9%	18 26.5%	50 73.5%	5 7.4%	63 92.6	231
<i>Internship Stage</i>	61 42.1%	84 57.9%	36 24.8%	109 75.2%	13 26.0%	37 74.0%	5 10.0%	45 90.0%	195
<i>Total</i>	187 40.2%	278 59.8%	120 25.8%	345 74.2%	81 30.3%	186 69.7%	29 10.9%	238 89.1%	732

Table 2

Beck Depression Inventory (BDI) scores by Medical School stage - Chi-squared and Binary logistic regression analyses, 2006 versus 2001

	2001 Sample †		2006 Sample		Chi		Regression				
	n	DD‡	n	DD‡	p	aOR	95% CI	p			
Pre-Clinical Stage											
Male	55	98.2	1.8	50	88	12.0	0.052	7.36	0.85	63.48	0.069
Female	102	83.3	16.7	99	86.9	13.1	0.55	0.75	0.34	1.65	0.48
Younger	39	92.3	7.7	19	78.9	21.1	0.20	3.2	0.64	16.07	0.16
Older	118	87.4	12.6	130	88.5	11.5	0.85	0.89	0.41	1.92	0.78
Clinical Stage											
Male	71	93	7.0	18	94.4	5.6	1.00	0.78	0.09	7.09	0.82
Female	92	85.9	14.1	50	90	10.0	0.60	0.68	0.23	2.02	0.48
Younger	45	91.1	8.9	5	100	0	1.00	0	0	0	0.99
Older	118	88.1	11.9	63	90.5	9.5	0.80	0.78	0.29	2.15	0.63
Internship Stage											
Male	61	73.8	26.2	13	84.6	15.4	0.50	0.51	0.1	2.56	0.42
Female	84	71.4	28.6	37	70.3	29.7	1.00	1.05	0.45	2.47	0.9
Younger	36	63.9	36.1	5	80	20.0	0.64	0.44	0.05	4.39	0.49
Older	109	75.2	24.8	45	73.3	26.7	0.84	1.1	0.5	2.44	0.81

† 2001 is comparison group.

aOR: adjusted Odds Ratio (adjusted for age in the gender-stratified models and for gender in the age-stratified models)

‡ DD = Dysphoria or Depression

Table 3

Main results of the qualitative study

Stage	Themes	Subthemes	Main Information	Classification	
Pre-Clinical Stage	Curriculum	Structure	No relevant changes	Stable	
		Free Area	"... was created a Free Area - during which there was no classes (one evening per week) - so the students could invest their time in what he wanted."	Positive	
		Scientific Activities	"The students were supported by the teachers to participate in scientific activities." "There was an increase in support scientific activities and in grants for scientific initiation."	Positive	
	Ragging (Hazing)	Intensity	The hazing was progressively worse in the period between 2001 and 2006! The representative of the Academic Committee says that there was police involvement in some episodes in 2006.	Negative	
		Punishment	"The ABCSM Director did not punish those who really performed the hazing." "The Academic Committee could often reverse sanctions that were unfair and promote greater ascertainment of facts by the ABCSM Board." "The ABCSM board could not hold the punishments for those involved on several occasions..."	Stable	
		Segregation	"The segregation of those who did not accept the hoax was only strong from 2006 onwards." "There was no segregation for the Athletics Committee activities. It begun in 2006." "Students who did not participated in the hazing were advised that it was known by the majority of the veterans. So they did not receive any aid. It happened frequently during the hazing."	Stable	
	Extra Academic Activities	Involvement	"The involvement of those of the board of athletic hindered the study period and generated a lot of stress because which are positions of great responsibility and criticism."	Stable	
	Clinical Stage	Curriculum	Structure	"In 2003 and 2004, there were important changes. The course were organized in blocks. Similar disciplines were taught together in a same period." "One of the best changes is the fourth year was the block-organization, because the students complained about the difficulty in studying all the subjects together in the last week of the semester. It did not happen when the disciplines were in blocks." "The creation of electives was a factor to diminish stress because the student could choose disciplines of great personnel interest." "When the project was finished, the expected changes were in accordance to each year: Third year - creation of the elective disciplines; Fourth year - course was organized in blocks."	Positive
			Scientific Production	"The students were supported by the teachers to participate in scientific papers." "There was an increase in support scientific production and in grants for scientific initiation."	Positive
Extra Academic Activities		Involvement	"The involvement of those of the board of athletic hindered the study period and generated a lot of stress because which are positions of great responsibility and criticism."	Stable	
Internship	Curriculum	Structure	"Creation of a Medical Emergencies discipline in the fifth year ..." "The creation of electives was a factor that diminished stress because the student could choose disciplines of great personnel interest." "... Creation of a elective period in the sixth year (from 2004) aiming to offer a training option as the choice of the student to	Positive	

Stage	Themes	Subthemes	Main Information	Classification
			<i>within the medical specialties. "</i>	
	<i>Teaching Quality</i>	Evaluations (National Teaching Evaluation)	<i>The coordinator stated that the course grade was D in 1999, C in 2000 B in 2001, A in 2002, B in 2003 and it made him very performed. "...ABCSM always stayed among the top 5 São Paulo State assessments for teaching quality and in number of residency programs. "</i>	Positive
<i>All Stages</i>	<i>Infrastructure</i>	School Building	<i>"... the incorporation of a big hospital (Mario Covas Hospital) enhanced more power to ABCSM at the time." "... there were good changes in infrastructure, such as reform of Amphitheaters, classrooms, creation of the Center for Research."</i>	Positive
		Academic and Athletic Committees	<i>"The athletic infrastructure was improved. There were new courts and a permission to use a soccer field. The students feel felt better wuth this acquisitions." "... we got a larger space, with internet, television, Video Game, Snooker Table, Pimbolin. People began to stay close together in the DA "</i>	Positive
	<i>Extra Academic Activities</i>	Parties and Social Events	<i>"I felt a decrease in the number of people at parties over the years, but I do not know if it was just an impression already that in the internship, I began to attend fewer such events. " "The drums test (parties with students drums tests onalmost all Fridays) have been getting progressively worse, with less people, people getting a little time..." "The director himself attended the festivities dressed in T-shirt of students' committee. "</i>	Negative
		ABCSM Board Support	<i>"The board became more supportive of athletic activities. There was an increase in money support, and an expansion in space sports and other activities..."</i>	Positive