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IN BRIEF REPORT

Cross-cultural Differences in Mental Health, Quality of Life, Empathy, and Burnout between US and Brazilian Medical Students

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Abstract
Objective This study aimed to compare mental health, quality of life, empathy, and burnout in medical students from a medical institution in the USA and another one in Brazil.
Methods This cross-cultural study included students enrolled in the first and second years of their undergraduate medical training. We evaluated depression, anxiety, and stress (DASS 21), empathy, openness to spirituality, and wellness (ESWIM), burnout (Oldenburg), and quality of life (WHOQOL-Bref) and compared them between schools.
Results A total of 138 Brazilian and 73 US medical students were included. The comparison between all US medical students and all Brazilian medical students revealed that Brazilians reported more depression and stress and US students reported greater wellness, less exhaustion, and greater environmental quality of life. In order to address a possible response bias favoring respondents with better mental health, we also compared all US medical students with the 50% of Brazilian medical students who reported better mental health. In this comparison, we found Brazilian medical students had higher physical quality of life and US students again reported greater environmental quality of life. Cultural, social, infrastructural, and curricular differences were compared between institutions. Some noted differences were that students at the US institution were older and were exposed to smaller class sizes, earlier patient encounters, problem-based learning, and psychological support.
Conclusion We found important differences between Brazilian and US medical students, particularly in mental health and wellness. These findings could be explained by a complex interaction between several factors, highlighting the importance of considering cultural and school-level influences on well-being.

Keywords Cross-cultural · Medical education · Depression · Anxiety · Quality of life

The medical profession is facing a challenging period with an increasing amount of burnout, mental disorders, stress, and dissatisfaction with work [1, 2]. A recent survey investigated 6880 US physicians and found burnout and satisfaction with work/life balance worsened from 2011 to 2014, while, in the same period of time, authors observed minimal changes in the same variables in other working US adults [1].

The same problem is also faced by medical residents and medical students, in which 20–50% screen positive for depression, 8–9% report suicidal ideation, and 30–60% report burnout [3, 4]. This student distress is associated with several sequelae in medical education, such as lower levels of empathy, higher levels of cynicism, worse academic performance, less professionalism, and suboptimal patient care practices [3, 5, 6].

Several reasons are identified as possible causes of this distress. Adjustment to medical school, interpersonal conflicts between students and teachers, exposure to death and suffering, personal life events, educational debt, and curricular factors (e.g., new learning methods, exposure to patients) are

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among the most cited [3, 6]. Other important factors that should be further explored include the cultural and social aspects of the learning environment such as students' experiences at an academic institution, including the curriculum, the facilities, and interactions with peers, faculty, and staff, as well as students' sense of the learning climate, or institutional ethos [7].

Although there are several studies published worldwide addressing mental health and burnout, few have carried out data collection across countries in the same time period and have used the same instruments [8–10]. Our hypothesis for the present study was that different wellness and mental health outcomes may exist between Brazilian and US medical students, based on the cultural, social, infrastructural, and curricular characteristics between countries, as well as differences in maturity levels among students. Exploration of these differences may provide information about some of the characteristics that are beneficial to medical students as well as some that may be harmful for students' mental health.

Methods

This was an observational, comparative, cross-sectional, and cross-cultural study carried out in the first half of 2015. The project was approved by both the institutional review board (IRB) of the University Teaching Hospital/Federal University of Juiz de Fora in Brazil and the IRB of the Southern Illinois University School of Medicine—USA. In the USA, the IRB gave expedited approval because all forms were completed anonymously and returning of the survey implied informed consent, whereas in Brazil students were asked to sign an informed consent form.

In Brazil, the data collection took place in the school of medicine of the Federal University of Juiz de Fora, a public university with approximately 1000 students attending the medical school. Undergraduate medical training spans 6 years (comprising 12 separate semesters) typically divided into three stages, each averaging 2 years: preclinical, clinical, and clerkship. Students in Brazil usually attend medical school at age 18 and do not have to attend 4 years of college first.

In the United States, the data collection took place at the Southern Illinois University School of Medicine, a public university with approximately 290 students attending the medical school. Medical training at the school spans 4 years and is divided into 2 preclinical years (largely basic sciences with some patient exposure), 1 clerkship year, and a final clinical elective year. In the USA, students attend medical school after first graduating from 4 years of an undergraduate program. The comparison of characteristics between the medical schools is presented in Table 1.

All students who were enrolled in the first 2 years of medical school (1st and 2nd year medical students) at both institutions were invited to participate. In Brazil and in the USA, those who did not complete the questionnaire or declined to take part in the study were excluded.

The same self-report survey, which took approximately 15–25 min to complete, was employed at both institutions. Questionnaires assessed sociodemographics (age, gender, and year in medical school); mental health through the Depression Anxiety and Stress Scale (DASS-21) [11], a 21-item short scale allowing assessment of depression, anxiety, and stress validated for use in the USA [11] and Brazil [12]; empathy, openness to spirituality (openness to or tolerance of others' spirituality needs and beliefs), and wellness behaviors through the Empathy, Spirituality, and Wellness in Medicine survey (ESWIM) [13], a 5-point Likert-type scale, which has been adapted to the Brazilian context and translated into Portuguese [14], burnout using the Oldenburg Burnout Inventory (OLBI), which includes three dimensions of exhaustion (affective, physical, and cognitive) and disengagement and has been previously validated for use in the USA [15] and Brazil [16]; and quality of life using the World Health Organization Quality of Life (WHOQOL-BREF) [17], a 26-item 5-point Likert-type scale addressing physical health, psychological health, social relationships, and environment (feeling that the environment is safe and things that are needed are accessible). This scale has also been previously validated for use in the USA and Brazil [17].

Data were collected at both schools, with guarantee of anonymity. In Brazil, data collection took place during class (before or after educational activities), at which time the researchers explained the objectives of the study and then asked students to complete the survey and sign the consent form. In the USA, survey booklets and pre-addressed return envelopes were placed in students' school mailboxes. Three email messages were sent to the classes reminding them to return the surveys. For first-year students, an additional opportunity to complete the survey was provided during one afternoon when students were offered a cupcake in a nearby lab room as an incentive to complete the survey.

Statistical analyses were carried out using the software package SPSS 21.0. In an attempt to minimize the "response rate bias," we analyzed the data in two different ways. First, we carried out the comparison between all 73 US medical students (48.6% response rate) and 138 Brazilian Students (83.6% response rate). Second, we carried out the comparison between all 73 US medical students (48.6% response rate) and the 85 Brazilian students with better mental health—those with higher scores when summing all items of DASS-21 (simulating a 50% response rate). This latter comparison was done to correct for possible over-representation of good mental health in the US sample that had a lower response rate, with the concern that perhaps only students with greater mental health chose to complete the optional survey.

Students from both countries were compared for demographic, mental health, quality of life, empathy, and burnout

Table 1 Comparison between American medical school and Brazilian medical school curricular and infrastructural characteristics

Characteristics	Federal University of Juiz de Fora School of Medicine, Brazil	Southern Illinois School of Medicine, USA
Country	Brazil	USA
Number of medical school years	6 years	4 years
Average hours of students activities inside medical school per week from year 1 to year 2	34 h/week (all learning activities, including lectures, labs, clinical experiences. No study time included[a])	60 h/week (all learning activities, including lectures, labs, clinical experiences, and study time)
Number of students/year	180 (90 students are admitted per semester)	72
Curriculum (1st and 2nd years)	Organized by subject (anatomy, physiology, biochemistry, etc.)	Subjects integrated by organ system [e.g. cardiovascular, respiratory, GI, etc.]
Full-time faculty/total student enrollment	0.12	1.2
Content delivery	- Lecture-based with some sparse practical activities as well. - Mostly Traditional. Only 30 h of PBL per year	- Self-directed study supplemented with a few lectures per week. - Years 1 and 2 problem-based learning
Assessment	Mostly summative assessment of cognitive knowledge. Formative assessment limited to some subjects (e.g. progress test)	Formative assessment of cognitive knowledge and clinical skills (e.g. OSCE's) during each preclinical unit, with summative assessment of both at the end of each unit
Student health services—medical support for students (provided by the medical school)	No	Yes
Mental health counseling—psychological support for students (provided by the medical school)	No	Yes
Medical student well-being/wellness program	No	Some optional sessions in Y1
Workshops and presentations promoting wellness	No	Yes
Fitness center for students	No	Yes
Students' lounge	Yes	Yes
Activity/lecture to avoid and/or punish sexual harassment on campus?	Yes	Yes
Hazing prohibited on campus?	Yes	Yes
Activities to avoid hazing on campus?	Yes	No
Project to deal with and decrease faculty unprofessional behavior?	No	Yes
Well-being accreditation standards for medical schools	No	Yes
Other well-being initiatives (social activities)	- Live music for the students (once a week) - religious and spiritual groups conducted by students	- Halloween party - Winter ball

[a] In Brazil, the study time is not included in the curricular activities

differences using chi-square or *t* tests. Since there were significant differences between students' ages between countries, we conducted another analysis adjusted for age as well. In order to correct for multiple comparisons, we used the Bonferroni procedure, requiring a $p < 0.001$ for evidence of significance.

Results

A total of 211 students were involved in our study (73 from the USA and 138 from Brazil). There was no difference across institutions regarding gender of respondents (47.9% were males in the USA, 34.5% were males in

Brazil, $p = 0.06$) or class (52.1% from 1st year in the USA, 48.2% from 1st year in Brazil, $p = 0.69$). However, we found that Brazilians, as expected, were younger than Americans (USA mean = 24.12 years, sd = 2.17, Brazil mean = 20.65 years, sd = 1.99, $p < 0.001$).

Table 2 shows the survey comparison results between US and Brazilian students. Comparing all first and second year US medical students with Brazilian medical students, we found Brazilian medical students reported more depressive symptoms ($p < 0.001$) and higher levels of stress ($p < 0.001$). On the other hand, US students reported greater wellness ($p < 0.001$), lower exhaustion ($p < 0.001$), and greater environmental quality of life (feeling that the environment is safe and things that are needed are accessible) ($p < 0.001$). When comparing all first and second year US medical students and the 50% of Brazilian medical students who scored the highest on the mental health surveys, we found that Brazilian medical students had higher physical (e.g., free from pain, satisfied with energy and ability to perform) quality of life

Table 2 Comparison between US medical students and Brazilian medical students

All US medical students (48.6% response rate) and all Brazilian medical students (83.6% response rate)			
	US medical students ($n = 73$)	Brazilian medical students ($n = 138$)	p**
	Mean (SE)*	Mean (SE)*	
DASS 21 depression	2.15 (0.55)	5.18 (0.37)	<0.001
DASS 21 anxiety	2.27 (0.50)	4.31 (0.34)	0.003
DASS 21 stress	5.30 (0.61)	10.19 (0.42)	<0.001
ESWIM empathy	55.16 (0.72)	53.04 (0.49)	0.009
ESWIM tolerance	26.68 (0.52)	26.26 (0.36)	0.543
ESWIM openness to spirituality	26.97 (0.47)	26.61 (0.32)	0.580
ESWIM wellness	26.35 (0.51)	23.18 (0.35)	<0.001
Oldenburg disengagement	23.01 (0.49)	22.24 (0.33)	0.241
Oldenburg exhaustion	20.55 (0.53)	17.53 (0.37)	<0.001
WHOQOL physical	56.15 (1.78)	60.85 (1.22)	0.051
WHOQOL psychol	66.70 (1.99)	62.16 (1.36)	0.091
WHOQOL social	77.05 (2.44)	68.58 (1.66)	0.010
WHOQOL environment	83.04 (1.83)	61.38 (1.25)	<0.001
All US students and the 50% Brazilian medical students with better mental health			
	US medical Students ($n = 73$)	Brazilian medical students ($n = 85$)	p**
	Mean (SE)*	Mean (SE)*	
DASS 21 depression	2.32 (0.36)	3.08 (0.34)	0.182
DASS 21 anxiety	2.33 (0.28)	2.08 (0.26)	0.574
DASS 21 stress	5.39 (0.47)	7.39 (0.44)	0.007
ESWIM empathy	55.29 (0.68)	53.62 (0.65)	0.120
ESWIM tolerance	26.48 (0.53)	26.83 (0.50)	0.676
ESWIM openness to spirituality	26.94 (0.47)	26.88 (0.43)	0.939
ESWIM wellness	26.26 (0.45)	24.87 (0.42)	0.050
Oldenburg disengagement	22.93 (0.48)	23.05 (0.44)	0.865
Oldenburg exhaustion	20.33 (0.48)	19.11 (0.45)	0.106
WHOQOL physical	55.57 (1.56)	66.55 (1.45)	<0.001
WHOQOL psychol	66.21 (1.59)	69.45 (1.48)	0.191
WHOQOL social	75.70 (2.21)	73.86 (2.05)	0.589
WHOQOL environment	82.07 (1.65)	64.65 (1.53)	<0.001

*Mean adjusted for age

**In order to correct the multiple comparison problems, we used Bonferroni procedure, resulting in a $p < 0.001$ as significant

($p < 0.001$). On the other hand, US students reported greater environmental (e.g., feeling safe, satisfied with environment) quality of life ($p < 0.001$).

Discussion

When compared to the US students, Brazilian medical students in our study showed significantly more depression, higher levels of stress, fewer wellness behaviors, more exhaustion, and lower environmental quality of life, but those with the highest mental health scores reported higher physical quality of life. These differences may reflect cultural as well as maturity differences, as we initially hypothesized.

Concerning the cultural differences, Latinos tend to be more emotional [18], which might explain why they report greater emotional distress in Brazil. Medical schools should be aware of these different backgrounds and should consider their students' profiles when implementing preventive measures designed to maintain or increase student wellness. This is especially true for schools that admit a significant number of students from various cultural backgrounds.

As expected, we found a 4-year age difference in respondents across the two countries. These differences can be explained by Brazilian students being admitted to medical school after high school, whereas US students matriculate after 4 years of college. Immaturity could play an important role in mental health problems, as noted by others [19]. Medical schools that admit younger students should deal with this issue and create strategies (e.g., mentoring, support groups) to help students cope with this new situation [20]. Likewise, the present study raises the question of whether direct entrance from high school in the Brazilian context is suitable or if it would be better to have a bachelor's degree first in order to increase study skills and maturity.

With regard to the infrastructure, we found a difference in the quality of life—environmental domain between Brazilian and US students. This finding may reflect the fact that this domain evaluates conditions such as financial resources, home environment, safety and security, physical environment (pollution, traffic), leisure activities, and health and social care, which are expected to be higher in more developed countries. In addition, Brazil was facing an economic and political crisis during our data collection period, which could also have impacted students' mental health and led to increased reporting of poorer quality of life.

Although both institutions are public, US schools charge tuition and fees whereas Brazilian public medical schools do not. Although the revenue generated from tuition represents only a small percentage of a US school's finances, it does provide a margin sufficient to add student services outside of the classroom. Some of these services, such as recreation centers, may have a positive impact on students' wellness. Also, the fact that US schools have multiple sources of revenue makes them less dependent on government support. On the other hand, tuition charges often result in significant student debt, which in turn can contribute to increased stress and diminished quality of life.

Finally, we suggest that curricular differences could partially be responsible for our findings. The class size of the Brazilian medical school was approximately twice that of the US school. In addition, Brazilian students have a predominance of lectures in the first 2 years of school, with work in large groups and multiple non-integrated disciplines. This is in contrast to the US students in this study who have a small group, active learning approach (problem-based learning or PBL) with significant patient exposure, which could impact student motivation, and engagement [21]. This is specific to the particular school in this study; most medical schools do not use a PBL format. Thus, further research including other US medical schools will be useful for further cross-cultural comparisons.

Within the last few years, accreditation standards for US medical schools were revised and a specific requirement was added to address student well-being and the learning environment. This is in contrast to Brazilian schools, where similar standards are not mandated. Another important difference between institutions in this study is that the US institution offers psychological and medical support to their students free of charge and on the medical campus. This support is essential to prevent, identify, and treat conditions that can impact students' life and academic performance. Whereas the differences we observed in this study are undoubtedly multi-factorial, holding schools accountable for student well-being and mental health may have contributed significantly to the higher reported wellness scores for US medical students.

This study has some limitations. First, we have investigated only one medical school from each country and the sample sizes were small. Thus, caution should be exercised before generalizing our findings to medical students in both countries. Second, although we adjusted our analyses to deal with the age differences of the study populations, factors such as maturity could not be controlled. Third, although we discussed several factors that could be responsible for different outcomes in mental health and wellness, we did not investigate how curricular, social, or environmental influences could affect the mental health of these students. Fourth, there were different response rates between countries. In order to minimize this bias, we carried out a second analysis as reported above. This analysis demonstrated that even when Brazilian medical students with better mental health were selected, the learning environment is still an important factor to be considered.

This is an exploratory study of medical education that aimed to assess and compare several markers of well-being and mental health in medical trainees in order to understand

some possible causes of the differences between two cultures. In order to achieve this, we applied the same instruments in the same period of time across two cultures. In conclusion, we found important differences between Brazilian and US medical students, particularly in mental health and wellness. These findings could be explained by a multifaceted and complex interaction between several factors, including cultural, social, environmental, and curricular aspects. Our results suggest that students' wellness involves several dimensions, and preventions and interventions should consider these different aspects when addressing this important health problem in medical trainees. Future wellness interventions designed to increase student well-being can be guided by a cross-cultural comparison that highlights specific differences in mental health, quality of life, empathy, and burnout between students in different countries.

Compliance with Ethical Standards The project was approved by both the institutional review board (IRB) of the University Teaching Hospital/UFJF in Brazil and the IRB of the Southern Illinois University School of Medicine—USA. In the USA, the IRB gave expedited approval because all forms were completed anonymously and completion of questionnaires was taken as consent, and therefore informed consent was not required, whereas in Brazil students were asked to sign an informed consent form.

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