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Sexual Orientation of Medical Students and Influence on Academic Performance and Mental Health

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Abstract: Introduction: Sexuality is a central aspect of being human, though its diversity is not completely accepted in society nor at medical schools. As a consequence, minority medical students face discrimination, poorer mental health, loneliness and worse academic performance. **Objective**: To investigate the sexual diversity of medical students and its possible influence on academic performance and mental health. **Method**: A descriptive cross-sectional study was conducted involving 187 undergraduate students of medicine. They answered a self-administrated multiple-choice questionnaire about their demographic characteristics, assigned sex at birth, sexual orientation, gender identity, whether sexual orientation and/or gender identity interferes with academic performance and whether they conceal their sexual orientation and/or gender identity. Participants also responded the Depression, Anxiety and Stress Scale (DASS-21) and questions about discrimination an loneliness. **Results**: Of the 187 undergraduate students of medicine that answered the questionnaire, 37,4% were LGBTQIA+ (lesbian, gay, bisexual), 62.5% were heterosexual and 100% were cisgender. Reported not openly assuming their sexuality 31.42% of the minority students. LGBTQIA+ accounted for 95, 72.90 and 81.82% of the students with extremely severe depression, anxiety and stress, respectively. Bisexual accounted for 63.63, 67.74 and 55.55% of LGBTQIA+ students with extremely severe depression, anxiety and stress, respectively. The majority of LGBTQIA+ students frequently felt alone (70%), isolated (72.85%) or excluded (68.58%). Most students (92.5%) reported their sexual orientation and/or gender identity did not affect their studies. **Conclusion**: LGBTQIA+ medical students present worse mental health (depression, anxiety and stress) and feel more excluded. Among them, bisexuals present greater vulnerability. Most medical students report their sexual orientation does not interfere with academic performance.

Keywords: Schools, Medical, Academic Performance, Sexual Minority, Mental Health

Introduction

Sexuality is a central aspect of being human throughout life; it encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy and reproduction[1]. Though the diversity of human sexuality, the hetero-cisnormative standard excludes the LGBTQIA+ community: lesbian, gay, bisexual, transgender, queer, questioning, intersex, asexual and plus[2].

As the discrimination of this minority exists in society, it is also present at medical schools. In a survey with 5,812 medical students from the United States and Canada[3], 15.8% identified as sexual and gender minority; 29.5% of these individuals hid their sexuality because of fear of discrimination in medical school, among other reasons. A cohort study [4] analyzed data from 27 504 graduating US medical students and showed that at least one episode of mistreatment was reported by a greater proportion of lesbian, gay, or bisexual (LGBTQIA+) students compared with heterosexual students (43.5% vs 23.6%). Furthermore, in comparison to heterosexual students, studies show that sexual and gender minorities are at greater risk of developing depression and anxiety[5], are more likely to report harassment and social isolation[5] and present higher rates of burnout symptoms[6].

In turn, a study carried out with Brazilian medical students also showed a higher prevalence of anxiety and depression symptoms in homo/bisexual when compared with heterosexuals[7]. Even though, more researches focusing on LGBTQIA+ medical students are required. Therefore, the aim of this study was to investigate the sexual orientation and gender identity of medical students and its possible influence on academic performance, on student's emotional states and on student's social stressors in a city in southeast Brazil.

Method

A descriptive cross-sectional study was conducted involving 320 students of the 1st, 2nd, 3rd and 4th years in a medical course of a higher education institution in the state of São Paulo, Brazil; students of the 5th and 6th years were not involved. This study received approval from the institutional review board (certificate number: 31459920.4.0000.5415).

The students were contacted via internet and received clarifications regarding the objectives and importance of the study. Those who agreed to participate signed a statement of informed consent and received a self-administrated multiple-choice questionnaire via the Google Forms platform.

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The following demographic characteristics were collected: age (up to 24 years or 25 to 35 years), self-declared skin color/ethnicity (white, black, brown, indigenous, yellow or other), year of undergraduate course (1st, 2nd, 3rd or 4th) and sex at birth (female or male).

The respondents were asked about sexual orientation (homosexual, heterosexual, bisexual, other orientation or "refuse to answer"), gender identity (cisgender man, cisgender woman, transgender, other identity or "refuse to answer"), whether sexual orientation and/or gender identity interferes with academic performance (yes or no) and whether they assume their sexual orientation and/or gender identity (yes or no).

Next, the 21-item Depression, Anxiety and Stress Scale (DASS-21) was answered[8], which is a set of three self-report subscales, each with seven items, used to measure the three emotional states of the students[9]. The subscale of depression analyzed if the student had positive feelings, had initiative, had something to look forward to, felt blue, felt enthusiastic, felt worth as a person and felt meaningless. The subscale of anxiety analyzed if the student had dryness of the mouth, experienced breathing difficulty, experienced trembling, was worried about panicking, felt close to panic, sensed heart rate increase and felt scared without reason. The subscale of stress analyzed if the student found it hard to wind down, tended to over-react, felt a lot of nervous energy, found it difficult to relax, found himself getting agitated, was intolerant and felt rather touchy.

Social stressors reported by the students were evaluated using five items[5]. Two of these items were taken from the Everyday Discrimination Scale[10]: "someone calls you some pejorative name or insults you" and "you are provoked, harassed or threatened". The other three items were taken from the UCLA Loneliness Scale[11]: "you felt alone, without companionship", "you felt isolated from others at least at some time" and "you felt excluded".
The sample size was calculated using the following formula: n = pop size x no / pop size + no , in which $no = \frac{1}{Eo^2}$. Considering a 5% error (Eo = 0.05) and no = $\frac{1}{Eo^2}$, the minimum sample was 178 participants.

Descriptive statistic was performed with the calculation of frequencies as well as measures of central tendency and dispersion. The inferential analysis was performed using the Chi-square Test, Fisher's Exact Test, Williams's G Test and Mann-Whitney Test. The G Test is an alternative to x^2 and is based on the multinominal probability distribution. For small samples there is an adjustment for the calculation of G which compensates low values that tend to overestimate the differences between observed and obtained values.

The p-values ≤ 0.05 were considered indicative of statistical significance. The computational programs used for the statistical analysis were GraphPad 3.10 and Bioestat 5.3.

Results

Of the 320 students contacted, 187 (58.4%) answered the questionnaire, 41 (22%) of whom were bisexual, 29 (15.5%) were homosexual and 117 (62.5%) were heterosexual. All the 69 male students reported being cisgender men and all the 118 female students reported being cisgender women. The demographic characteristics of the lesbian, gay and bisexual (LGBTQIA+) participants and non-LGBTQIA+ are displayed in Table 1.

Table 1. Demographic characteristics of participants in LGBTQIA+ and non-LGBTQIA+ groups.

	LGBTQIA+ n = 70 (100%)	Non-LGBTQIA+ n = 117 (100%)	p-value
Sex			
Female	40 (57.14%)	78 (66.67%)	0.7797*
Male	30 (42.86%)	39 (33.33%)	
Age			
up to 24	60 (85.71%)	109 (93.16%)	0.1241**
25 to 34	10 (14.29%)	8 (6.84%)	
Year in course			
1st	19 (27.14%)	13 (11.11%)	0.0039*
2nd	17 (24.29%)	27 (23.08%)	
3rd	22 (31.43%)	32 (27.35%)	
4th	12 (17.14%)	45 (38.46%)	

* Chi-square Test
** Fisher's Exact Test

No significant difference between the LGBTQIA+ and non-LGBTQIA+ groups was found regarding sex (p = 0.7797) or age (p = 0.1241). A significant difference between groups was found regarding year of the undergraduate course (p = 0.0039): the largest portion of the LGBTQIA+ group was in the 3rd year (31.43%) and the largest portion of the non-LGBTQIA+ group was in the 4th year (38.46%).

Openly assumed their sexuality 165 students, of whom 117 (70.91%) were heterosexuals, 21 (12.73%) were

bisexuals and 27 (16.36%) were homosexuals. Did not openly assume their sexuality 22 students, of whom 10 (90.91%) were bisexual and 2 (9.09%) were homosexual (Table 2). Bisexual students were more likely not to assume their sexuality (20/41; 48.78%) compared to homosexual students (2/27; 7.40%).

Table 2. Number of students who assume or do not assume sexuality according to sexual orientation.

	Assumes sexuality n = 165 (100%)	Does not assume sexuality n = 22 (100%)	p-value
Bisexual	21 (12.73%)	20 (90.91%)	< 0.0001*
Heterosexual	117 (70.91%)	0 (0.00%)	
Homosexual	27 (16.36%)	2 (9.09%)	

*Chi-square Test

A total of 173 students (92.5%) reported that their sexual orientation and/or gender identity did not affect their studies, 33.53% of whom were LGBTQIA+ and 66.47% were non-LGBTQIA+. Among those who reported interference, 11 (5.88%) reported a negative influence and 90.91% of these students were in the LGBTQIA+ group. A significant association was found between sexual orientation and the issue of interference in studies (p = 0.0007), with the majority of students reporting that sexual orientation did not affect academic performance (Table 3).

Table 3. Perception of students regarding interference of their own sexual orientation and/or gender identity in studies.

	Does not interfere n = 173	Interfere positively n = 3	Interfere negatively n = 11	p-value
LGBTQIA+ n = 70 (100%)	58 (82.85%)	2 (2.85%)	10 (14.28%)	0.0007*
Non-LGBTQIA+ n = 117 (100%)	115 (98.29%)	1 (0.85%)	1 (0.85%)	

*Williams´s G Test

LGBTQIA+ students accounted for 95% of the 20 students with extremely severe depression, 61.11% of the 18 students with severe depression and 38.78% of the 49 students with moderate depression. A significant association was found between sexual orientation and degree of depression (p < 0.0001). Bisexual students accounted for 63.63% of LGBTQIA+ with severe depression and 73.68% of those with extremely severe depression.

LGBTQIA+ students accounted for 72.90% of the 43 students with extremely severe anxiety. A significant association was found between sexual orientation and degree of anxiety (p < 0.0001). Bisexual students accounted for 67.74% of LGBTQIA+ with extremely severe anxiety.

LGBTQIA+ students accounted for 81.82% of the 22 students with extremely severe stress. A significant association was found between sexual orientation and degree of stress (p = 0,0172). Bisexual students accounted for 55.55% of LGBTQIA+ with extremely severe stress.

The results referring to depression, anxiety and stress according to the DASS-21 are displayed in Table 4.

Table 4. Number of LGBTQIA+ and non-LGBTQIA+ students who suffer from depression, anxiety and stress according to DASS-21.

Depression	Normal n = 85 (100%)	Mild n = 15 (100%)	Moderate n = 49 (100%)	Severe n = 18 (100%)	Extremely Severe n = 20 (100%)	p-value
LGBTQIA+	16 (18.82%)	5 (33.33%)	19 (38.78%)	11 (61.11%)	19 (95.00%)	0.0305*
Non-LGBTQIA+	69 (81.18%)	10 (66.67%)	30 (61.22%)	7 (38.89%)	1 (5.00%)	
Anxiety	Normal n = 59 (100%)	Mild n = 20 (100%)	Moderate n = 40 (100%)	Severe n = 25 (100%)	Extremely Severe n = 43 (100%)	p-value
LGBTQIA+	13 (22.03%)	2 (10.00%)	18 (45.00%)	6 (24.00%)	31 (72.09%)	0.0257*
Non-LGBTQIA+	46 (77.97%)	18 (90.00%)	22 (55.00%)	19 (76.00%)	12 (27.91%)	

Stress	Normal n = 66 (100%)	Mild n = 22 (100%)	Moderate n = 39 (100%)	Severe n = 38 (100%)	Extremely Severe n = 22 (100%)	p-value
LGBTQIA+	16 (24.24%)	6 (27.27%)	9 (23.08%)	21 (55.26%)	18 (81.82%)	0.0296*
Non-LGBTQIA+	50 (75.76%)	16 (72.73%)	30 (76.92%)	17 (44.74%)	4 (18.18%)	

* Mann-Whitney Test

The majority of students (LGBTQIA+ or not) was never or less than once per year called a pejorative name, insulted, provoked, harassed or threatened. Thus, it was not possible to establish a significant association between everyday discrimination and the sexual orientation of the students (p = 0.8355 and 0.6305).

The results of the UCLA Loneliness Scale revealed that the majority of LGBTQIA+ students reported sometimes or often feeling alone (70%), isolated (72.85%) or excluded (68.58%). Significant associations were found between loneliness and sexual orientation: LGBTQIA+ felt more alone (p = 0.0049), isolated from other people (p = 0.0101) and excluded (p = 0.0308) (Table 5).

Table 5. Loneliness reported by students according to LGBTQIA+ and non-LGBTQIA+ groups.

	You felt alone, without companionship			You felt isolated from others at least at some time			You felt excluded		
	LGBTQIA+ n = 70 (100%)	Non-LGBTQIA+ n = 117 (100%)	p-value	LGBTQIA+ n = 70 (100%)	Non-LGBTQIA+ n = 117 (100%)	p-value	LGBTQIA+ n = 70 (100%)	Non-LGBTQIA+ n = 117 (100%)	p-value
Never	4 (5.71%)	12 (10.26%)	0.0049*	2 (2.86%)	14 (11.97%)	0.0101*	5 (7.14%)	14 (11.97%)	0.0308*
Rarely	17 (24.29%)	51 (43.59%)		17 (24.29%)	28 (23.93%)		17 (24.29%)	40 (34.19%)	
Sometimes	32 (45.71%)	43 (36.75%)		32 (45.71%)	60 (51.28%)		31 (44.29%)	52 (44.44%)	
Often	17 (24.29%)	11 (9.40%)		19 (27.14%)	15 (12.82%)		17 (24.29%)	11 (9.40%)	

*Chi-square Test

Discussion

In the present study, 37.4% of the students identified themselves as LGBTQIA+, but 31.42% of this group reported not openly assuming their sexuality. Some individuals conceal their sexuality in an effort to minimize personal experiences with discrimination and protect themselves from its harmful consequences. A similar rate of sexuality concealment (29.5%) was found in a survey with American and Canadian medical students[3], in which the most common reasons for concealing one's sexual identity were "nobody's business", fear of discrimination in medical school and social or cultural norms. Another study[12] with U.S. residents who identify as sexual or gender minorities concluded that, on one hand, being more open is associated with greater community integration, which has direct benefit for mental health. On the other hand, greater openness goes with perceiving LGBTQIA+TQ + -based discrimination which is costly to mental health.

Of those who concealed the sexuality, 90.91% were bisexual, which implies greater vulnerability of this minority subgroup. An online survey[13] with bisexual and other non-monosexual (bi+) people from U.S. identified two motivations for concealment: intrapersonal motivations (one's bi+ identity not being a central part of one's overall identity, not being comfortable with being bi+) and interpersonal motivations (concern about being judged or treated negatively, concern about putting oneself at risk of physical harm). Interpersonal motivations were significantly associated with higher levels of depression and generalized anxiety. This greater vulnerability is partially due to the intolerance a person is submitted to by not following the binarism of the society's standard love relations. Thus an individual who feels attracted to both sexes may be misunderstood, have difficulty establishing interpersonal relationships and be seen as "undecisive" or "immature"[14].

The only sexual diversity found in the institution was concerning sexual orientation, since all the 187 students were cisgenders, exposing the invisibility of the transgender community, that does not exist among the students. Transgender are invisible in most cultures because social structures assume a binary classification of gender and individuals are expected to assume the gender of their biological sex as well as roles associated with it. Because this community violates conventional expectations, they become targeted for discrimination and victimization[15]. Literature has reported various forms of transgender discrimination in medical schools: medical students not knowing the meaning of "transgender" and presenting inadequate responses regarding the gynecological examination in trans patients[16], the lack of content aimed at trans health in medical schools[17] and the lack of publications on the health of people whose gender identity is considered as dissident[18] are some examples.

Most students in the present study reported that their sexual orientation did not interfere with academic performance. Although, studies of the Association of American Medical Colleges Graduation Questionnaire[4, 19] found that LGBTQIA+ students are mistreated, have opportunities for training and rewards denied and receive poor evaluations based on their sexuality rather than their performance[4]. Moreover, LGBTQIA+ students disproportionately reported perceiving a lack of respect for diversity among faculty, which has important implications for the learning environment, and the well-being of medical trainees[19]. Thus, further studies are needed to determine whether the findings cited occur at Brazilian medical schools.

LGBTQIA+ students in the present investigation accounted for the majority of students with extremely severe depression, anxiety and stress; they also felt more alone, isolated and excluded. These findings are consistent with data described in national[7, 20, 21] and international[5, 6, 22] studies and confirm how the disparities in mental health status and social isolation are attributed to the stigma, discrimination and violence faced by LGBTQIA+ individuals as a marginalized minority group woldwide[1, 23].

The greater frequency of extremely severe depression, anxiety and stress among bisexuals compared to homosexuals and heterosexuals confirms the greater vulnerability of this group in the undergraduate course, again confirming the greater vulnerability of the subgroup. Accordingly, a systematic review of studies that reported bisexual-specific data[24] confirmed that bisexual people exhibit higher or equivalent rates of depression and anxiety in comparison to lesbian/gay people. It proposed three interrelated contributors to these disparities: experiences of sexual orientation-based discrimination, bisexual invisibility/erasure, and lack of bisexual-affirmative support.

Changes are needed to improve the current scenario. Medical institutions should interfere in the hetero-cisnormative medical culture through the recruitment of LGBTQIA+ students, employees and teaching staff, the encouragement of support groups for social minorities[25] and the transformation of the campus into a safe environment for students to assume their true identities[26]. Moreover, medical education needs to include clinical cases of the LGBTQIA+ population in the classroom[27] and to embrace the concept of the biopsychosocial being and the social determination in the health-disease-care process[28], contributing to a non-discriminatory curriculum.

Despite the efforts to limit sampling bias, this study found a greater proportion than expected of respondents who identified themselves as LGBTQIA+ (37.43%). The subject of the questionnaire likely contributed to the greater participation of LGBTQIA+ students. Moreover, there were no transgenders among the participants, which impedes establishing associations between this group and the issues addressed. Lastly, some caution must be taken regarding the interference on academic performance, which was evaluated using the student's own perception on the subject instead of using a validated measurement.

Conclusions

The LGBTQIA+ discrimination is present among the undergraduate students of medicine who participated the present study. The minority is more exposed to extremely severe depression, anxiety and stress and also feels more alone, isolated and excluded. Extremely severe depression, anxiety and stress are more frequent among bisexuals compared to homo and heterosexuals, therefore they present greater vulnerability. Most students do not report interference of their sexual orientation in academic performance.

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