Portuguese Medical Students' Knowledge and Attitudes Towards Homosexuality

Conhecimentos e Atitudes de Estudantes de Medicina Portugueses Face à Homossexualidade

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ABSTRACT

Introduction: Lesbian, gay, bisexual and transgender people still face discrimination in healthcare environments and physicians often report lack of knowledge on this population's specific healthcare needs. In fact, recommendations have been put forward to include lesbian, gay, bisexual and transgender health in medical curricula. This study aimed to explore factors associated with medical students' knowledge and attitudes towards homosexuality in different years of the medical course.

Material and Methods: An anonymous online-based questionnaire was sent to all medical students enrolled at the Faculty of Medicine - University of Porto, Portugal, in December 2015. The questionnaire included socio-demographic questions, the Multidimensional Scale of Attitudes Toward Lesbians and Gay Men (27 items) and a Homosexuality Knowledge Questionnaire (17 items). Descriptive statistics, ANOVAs, Chi-square tests and Pearson's correlations were used in the analysis.

Results: A total of 489 completed responses was analyzed. Male gender, religiosity and absence of lesbian, gay or bisexual friends were associated with more negative attitudes towards homosexuality. Attitudinal scores did not correlate with advanced years in medical course or contact with lesbian, gay or bisexual patients. Students aiming to pursue technique-oriented specialties presented higher scores in the 'Modern Heterosexism' subscale than students seeking patient-oriented specialties. Although advanced years in medical course correlated significantly with higher knowledge scores, items related with lesbian, gay or bisexual health showed the lowest percentage of correct answers.

Conclusion: There seems to be a lack of exploration of medical students' personal attitudes towards lesbians and gay men, and also a lack of knowledge on lesbian, gay or bisexual specific healthcare needs. This study highlights the importance of inclusive undergraduate curriculum development in order to foster quality healthcare.

Keywords: Attitude of Health Personnel; Homosexuality, Female; Homosexuality, Male; Portugal; Students, Medical; Surveys and Questionnaires.

RESUMO

Introdução: A população lésbica, *gay*, bissexual e transgénero enfrenta ainda preconceito nos cuidados de saúde e, para além disso, os médicos frequentemente referem falta de conhecimento sobre as necessidades de saúde específicas desta população. Este estudo teve como objetivo explorar os fatores associados com as atitudes e conhecimentos dos estudantes de medicina face à homossexualidade em diferentes anos do curso de medicina.

Material e Métodos: Foi enviado um questionário *online* anónimo a todos os estudantes de medicina matriculados na Faculdade de Medicina da Universidade do Porto em dezembro de 2015. O questionário incluía questões sociodemográficas, a Escala Multidimensional de Atitudes face a Lésbicas e a *Gays* (27 itens) e um Questionário de Conhecimento quanto à Homossexualidade (17 itens). Na análise dos dados foram utilizados estatística descritiva, ANOVAs, testes Chi quadrado e correlações de Pearson.

Resultados: A análise incluiu 489 respostas. Os estudantes que se identificaram como sendo do género masculino, mais religiosos e com menos amigos lésbicas, *gays* ou bissexuais revelaram atitudes mais negativas em relação à homossexualidade. Anos mais avançados no curso ou maior contacto com pacientes lésbicas, *gays* ou bissexuais não se correlacionaram com as atitudes avaliadas. Apesar da progressão no curso se ter correlacionado significativamente com níveis mais elevados de conhecimento, os itens relacionados com saúde lésbicas, *gays* ou bissexuais apresentaram menor percentagem de respostas corretas.

Conclusão: As atitudes dos estudantes de medicina face a lésbicas e *gays* parecem ser pouco exploradas ao longo do curso de medicina, havendo também falta de conhecimento sobre as necessidades específicas de saúde das pessoas lésbicas, *gays* ou bissexuais. Este estudo destaca assim a importância do desenvolvimento de um currículo médico inclusivo, crucial na promoção da qualidade dos cuidados de saúde.

Palavras-chave: Atitude do Pessoal de Saúde; Estudantes de Medicina; Homossexualidade Feminina; Homossexualidade Masculina; Inquéritos e Questionários; Portugal.

INTRODUCTION

Although homosexuality was only removed from World Health Organization (WHO) list of mental disorders in 1990, it is now increasingly accepted as part of human sexuality.[1] Notwithstanding the widespread visibility and equal rights acknowledgement to lesbians, gay men and bisexual (LGB) people across the world, there are evidences that prejudice and discrimination toward LGB people – in other words, homophobia[2] - still exist in society, including in healthcare settings.[3-6]

In Portugal, where the present study was conducted,

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there have been important legislative achievements regarding the civil rights of lesbian, gay, bisexual and transgender (LGBT) people.[7,8] For instance, in 2016, with the approval of the same-sex couples adoption bill, Portugal reached the 4th position in ILGA-Europe ranking of LGBT rights achieved by countries.[9] Nevertheless, in a recent study with a sample of 600 Portuguese LGB participants, 17% reported to have faced discrimination in healthcare services and it was suggested that homosexuality can be 'cured' in 11% of mental health appointments.[10]

LGB patients have specific healthcare needs and may face several barriers in healthcare settings.[11-13] In fact, recent attention has been given to health disparities affecting lesbians and gay men, grouped as risk behaviour disparities (e.g. higher smoking prevalence or substance abuse), mental and behavioural disparities (e.g. increased risk for depression, anxiety and suicide attempts), and also physical health disparities (e.g. higher risk of obesity among lesbian and bisexual women, of anal cancer among gay men, and even cardiovascular disease).[13] Rather than inherent to homosexuality, these disparities are thought to arise from being LGB in a homophobic society.[14] In the 'minority stress' concept, Meyer suggests that the combination of prejudice experiences, rejection expectations, internalized homophobia and concealment negatively affects lesbian and gay populations' health.[15,16]

Adding to this, LGB patients might perceive discrimination in the healthcare environment and feel compelled to hide their sexual orientation from healthcare providers, impairing not only the patient-physician relationship but also promoting this population's relative 'invisibility'. Studies report that, after scanning the environment and monitoring provider behaviour,[17] a great percentage of lesbian women and gay men do not disclose their sexual orientation to their regular physician.[4] Moreover, homosexual patients who disclose may find a physician unprepared to address homosexual health specificities or unwilling to discuss same-sex relationships and behaviour. Accordingly, recent studies have found that providers feel unprepared to provide quality healthcare for LGBT patients and report reduced comfort and knowledge about the specificities of this population.[5,6,18,19] Furthermore, physicians' prejudice towards lesbian and gay men has been studied and even differences on homophobia levels by specialty have been reported.[20,21]

Given the diversity of human sexuality, it is likely that physicians will encounter patients that identify as homosexuals or that report non-heterosexual behaviours. Despite several recommendations and reports suggesting that sexuality topics should be tackled during physicians' training,[13,22-24] undergraduate medical curricula often do not include comprehensive education on homosexuality,[13] neither in other sexuality topics.[22,25] In fact, although expressed in a more subtle way, prejudice against homosexual patients is found among medical students.[26-31] Moreover, students might conform to their tutors' approaches towards homosexuality in clinical practice, stressing the importance of role-models in medical education. As described in Fallin-Bennett's article, given that medical students tend to emulate behaviours that they observe from their tutors, and that they will become physicians and tutors themselves, prejudice will likely tend to perpetuate in healthcare environments.[32]

Homophobia has been associated with personal characteristics and so, effective interventions must take some aspects into account: gender is one of the most accurate correlates of homophobia, with men's attitudes being more negative than women's ones,[33] higher levels of religiosity have consistently been associated with more negative attitudes towards lesbians and gay men,[34,35] finally, interpersonal contact with lesbians and gay men has also been related to an increased acceptance of non heterosexual persons.[26,36]

With this study we sought to explore attitudes towards lesbians and gay men and knowledge on homosexuality in a sample of Portuguese medical students'. In accordance to the literature, we anticipate that medical students identifying as male gender, more religious and reporting less contact with lesbians and gay men will present more negative attitudes and less knowledge on homosexuality. Furthermore, we aimed to explore differences on attitudes and knowledge scores of students in different years of the medical course and by intended medical specialization career.

MATERIAL AND METHODS

Participants

All undergraduate medical students enrolled at the Faculty of Medicine - University of Porto (FMUP) were invited to participate in a cross-sectional study by filling an anonymous online-based questionnaire sent through FMUP students' mailing list. The questionnaire was created using the GoogleForms platform and was available from December 1st 2015 until January 31st 2016. Participants consent was assumed by their voluntary completion of the questionnaire, available after a brief description of the study that also included anonymity and confidentiality information. Students that participated in the study did not receive any form of compensation. The Ethics Committee for Health at the Faculty of Medicine, University of Porto, approved the study.

Study instrument

A self-administered questionnaire consisting of three sections was implemented: section one covered socio-demographic data, section two consisted of the Multidimensional Scale of Attitudes Toward Lesbians and Gay Men (MSATLG)[37] and section three consisted of a Homosexuality Knowledge Questionnaire.

Section 1: Socio-demographic Information

Section one included questions on participants' age, year in medical course, gender identity, sexual orientation, religiosity and the number of lesbian, gay or bisexual (LGB)

close friends. Religiosity was assessed by asking students to rate the importance of religious values in their everyday life, using a 6-point Likert-type scale from one (*Unimportant*) to six (*Extremely important*). Students from the fourth to the sixth years of medical course, whose training occurs mostly in clinical settings, were asked about the number of self identified LGB patients they had contact with. Medical students in the sixth year (final year) of medical studies were also asked to reveal, of a comprehensive list of medical specialties available in Portugal, which specialization they would like to pursue after finishing medical school.

Section 2: Attitudes towards Lesbians and Gay Men

Section two consisted of MSATLG, a Portuguese validated scale that allows to explore coexisting attitudes towards homosexuality.[37] The instrument comprises 27 items/sentences assessing three negative attitudinal dimensions, rejection of proximity (RP – 11 items), homosexuality pathologization (HP – five items) and modern heterosexism (MH – seven items), and one positive attitudinal dimension, support (SP – five items). RP measures a classical manifestation of prejudice related to the avoidance of being with lesbians and gay men in diverse social circumstances (e.g, 'I would feel uneasy if I found out that my doctor was not heterosexual'). HP refers to a traditional attitude of moral condemnation and pathologization of homosexuality (e.g., 'Lesbians and gay men should undergo therapy to change their sexual orientation'). MH measures modern prejudice attitudes, mainly related to same-sex marriage and parenting (e.g., 'I believe same-sex parents are as capable of being good parents as heterosexual parents'). SP evaluates the desirability of making visible one's homosexual orientation (e.g., 'Organizations that promote gay rights are necessary'). Participants rated their agreement with each statement on a 6-point Likert scale ranging from 1 (Strongly disagree) to 6 (Strongly agree). This scale has demonstrated a high degree of reliability and construct validity within samples of university students.[37,38]

Section 3: Homosexuality Knowledge Questionnaire

Section three consisted of a 17-item questionnaire elaborated through the compilation of statements from previous studies that explored LGBT knowledge: thirteen items from the questionnaire used in Dunjic-Kostic report[28] and one item from Sanchez article.[27] Three items about health disparities were adapted from AAMC's "Implementing Curricular and Institutional Climate Changes to Improve Health care for individuals who are LGBT, Gender Non Conforming or Born with DSD" manual.[13]

The instrument was independently translated into Portuguese by two translators fluent in English. These translations were revised by the research team to improve understandability of items and then combined into a single version that was tested with five students in order to confirm that the translation was acceptable and understandable, using simple and appropriate language.

In the end, the questionnaire contained items that address common myths about homosexuality (e.g. 1, 5, 6 and 12) and items more related to health disparities (e.g. 7, 8, 9, 10 and 16). Participants expressed their opinion about the veracity of each statement, signalling 'True', 'False' or 'I don't know'.

Statistical analysis

Data was analyzed using SPSS version 23.0 (SPSS Inc., Chicago, IL, USA). Frequency distributions were used to characterize participant's socio-demographic profile. The years of the medical course were grouped in 'pre-clinical' (1^{st} – 3^{rd}) and 'clinical' (4^{th} – 6^{th}) years. Medical specialties were grouped following the person-oriented and technique-oriented taxonomy: person-oriented refers to specialties that focus on holistic care (e.g. internal medicine, family medicine, psychiatry) and technique-oriented focus on a specific organ system, technical skills and instruments (e.g. surgery, anaesthesiology, obstetrics/gynaecology).[39,40] The MSATLG subscales' normality was assessed using skewness (sk) and kurtosis (ku) coefficients: we considered a normal distribution if $|sk| < 3$ and $|ku| < 10$. Cronbach alpha's were calculated to assess the subscales' internal consistency. On the Homosexuality Knowledge Questionnaire, the number of correct answers was calculated considering the option 'I don't know' as a wrong answer. Analyses of variance (ANOVAs) and Chi-square tests were used to measure differences and Pearson correlations were used to investigate the association between variables. Statistical significance was set at $p < 0.05$.

RESULTS

A total of 508 completed questionnaires were obtained, representing approximately 29% of the study population. The response rate for each year ranged from 20% to 43%. Six participants were excluded from the study due to the absence of information on age and gender. To ensure the homogeneity and representativeness of our sample, 13 students were also excluded because their age was three standard deviations above the mean age of our sample. The final sample comprised 489 medical students from all six years of medical course.

Section 1: Socio-demographic information

Concerning gender, 68.5% of students identified as female (n = 335) and 31.5% identified as male (n = 154). No students identified as transgender or 'other'. Regarding sexual orientation, 83.0% of students identified as heterosexual (n = 406), 8.0% identified as homosexual (n = 39) and 5.5% as bisexual (n = 27). Concerning interpersonal contact, 78.3% reported at least one LGB friend (n = 382). Among students in the clinical years of medical course, 59.7% reported that they never had any contact with LGB patients (n = 169). Detailed demographic information is presented in Table 1.

Section 2: Attitudes towards lesbians and gay men

Table 1 - Demographic characteristics of FMUP undergraduate medical students (n = 489) responding to a survey on knowledge and attitudes towards homosexuality in 2016

	Female No. (% of 335)	Male No. (% of 154)	Total No. (% of 489)
Year in medical course			
1st	34 (10.1)	21 (13.6)	55 (11.2)
2nd	59 (17.6)	20 (13.0)	79 (16.2)
3rd	41 (12.2)	23 (14.9)	64 (13.1)
4th	42 (12.5)	19 (12.3)	61 (12.5)
5th	69 (20.6)	29 (18.8)	98 (20.0)
6th	90 (26.9)	42 (27.3)	132 (27.0)
Sexual orientation			
Heterosexual	311 (92.8)	95 (61.7)	406 (83.0)
Homosexual	2 (0.6)	37 (24.0)	39 (8.0)
Bisexual	11 (3.3)	16 (10.4)	27 (5.5)
Other / No response	11 (3.3)	6 (3.9)	17 (3.5)
LGB friends			
0	63 (18.8)	43 (28.1)	106 (21.7)
1 - 2	134 (40.0)	52 (34.0)	186 (38.1)
3 - 5	102 (30.4)	35 (22.9)	137 (28.1)
6 - 10	21 (6.3)	11 (7.2)	32 (6.6)
> 10	15 (4.5)	12 (7.8)	27 (5.5)
LGB patients*			
0	120 (61.2)	49 (56.3)	169 (59.7)
1 - 2	56 (28.6)	22 (25.3)	78 (27.6)
3 - 5	18 (9.2)	15 (17.2)	33 (11.7)
6 - 10	2 (1.0)	0 (0.0)	2 (0.7)
> 10	0 (0.0)	1 (1.1)	1 (0.4)
Medical specialty§			
Patient oriented	35 (38.9)	13 (31.0)	48 (36.4)
Technique oriented	55 (61.1)	29 (69.0)	84 (63.6)
Religiosity			
mean (SD)	2.94 (1.25)	2.56 (1.29)	2.82 (1.27)
Age			
mean (SD)	21.75 (2.63)	21.66 (2.52)	21.72 (2.59)

* 4th - 6th year students (n = 291); § 6th year students (n = 132). FMUP; Faculty of Medicine, University of Porto; LGB: Lesbians, gay men and bisexual.

Totals may not equal total sample because some students did not respond to all variable questions and sections.

The MSATLG revealed good levels of internal consistency in our sample: RP (α = 0.84), HP (α = 0.80), MH (α = 0.77) and SP (α = 0.75). MH and SP presented a normal distribution and RP and HP subscales presented an asymmetric and leptokurtic distribution.

Concerning gender, male students presented higher scores on RP (p < 0.001) and MH (p = 0.002) subscales and lower scores of SP (p = 0.009) compared to female students (Table 2). No significant differences were obtained for the HP subscale. Religiosity correlated significantly with more negative attitudes toward lesbian and gay men, both in traditional (PR and HP) and modern expressions (MH), as present in Table 3.

Medical students that reported to have LGB friends had

Table 2 - Multivariable analysis of the Multidimensional Scale of Attitudes toward Lesbian and Gay Men (n = 469) and the Homosexuality Knowledge Questionnaire (n = 480) among FMUP undergraduate medical students in 2016

	Multidimensional Scale of Attitudes Toward Lesbian and Gay Men								Homosexuality Knowledge Questionnaire	
	RP		HP		MH		SP			
	mean (DP)	*p*	mean (DP)	*p*	mean (DP)	*p*	mean (DP)	*p*	mean (DP)	*p*
Gender		< 0.001		0.10		0.002		0.009		0.61
Female	1.27 (0.34)		1.21 (0.36)		2.45 (0.72)		4.86 (0.74)		9.16 (2.42)	
Male	1.45 (0.49)		1.27 (0.40)		2.69 (0.91)		4.67 (0.79)		9.03 (2.76)	
Year in medical course		0.85		0.96		0.28		0.02		< 0.001
Pre-clinical (1st – 3rd)	1.32 (0.41)		1.23 (0.39)		2.57 (0.82)		4.90 (0.74)		8.54 (2.63)	
Clinical (4th – 6th)	1.33 (0.39)		1.23 (0.37)		2.49 (0.77)		4.74 (0.77)		9.50 (2.40)	
LGB friends		0.04		0.30		0.03		0.11		0.08
Yes	1.31 (0.39)		1.22 (0.36)		2.48 (0.81)		4.83 (0.75)		9.22 (2.54)	
No	1.40 (0.44)		1.26 (0.41)		2.68 (0.70)		4.69 (0.78)		8.73 (2.47)	
LGB patients*		0.21		0.08		0.90		0.17		0.21
Yes	1.37 (0.44)		1.27 (0.39)		2.49 (0.78)		4.67 (0.75)		9.71 (2.42)	
No	1.31 (0.36)		1.20 (0.35)		2.48 (0.76)		4.80 (0.77)		9.34 (2.37)	
Medical specialty§		0.51		0.37		0.03		0.29		0.36
Patient oriented	1.33 (0.36)		1.22 (0.36)		2.37 (0.73)		4.71 (0.79)		9.48 (2.53)	
Technique oriented	1.38 (0.46)		1.28 (0.40)		2.67 (0.80)		4.56 (0.78)		9.88 (2.33)	

* 4th to 6th year students (n = 291); § 6th year students (n = 132). FMUP: Faculty of Medicine, University of Porto; RP: Rejection of proximity; HP: Homosexuality pathologization; MH: Modern heterosexism; SP: Support.

Totals may not equal total sample because some students did not respond to all variable questions and sections.

Table 3 - Correlations of the Multidimensional Scale of Attitudes toward Lesbian and Gay Men (n = 469) and the Homosexuality Knowledge Questionnaire (n = 480) among FMUP undergraduate medical students in 2016

	Multidimensional Scale of Attitudes Toward Lesbian and Gay Men								Homosexuality Knowledge Questionnaire	
	RP		HP		MH		SP			
	Pearson	*p*	Pearson	*p*	Pearson	*p*	Pearson	*p*	Pearson	*p*
Religiosity	0.109	0.019	0.169	< 0.001	0.244	< 0.001	-0.052	0.26	-0.151	0.001
Year in medical course	0.029	0.53	0.007	0.88	-0.047	0.31	-0.123	0.008	0.229	< 0.001
LGB friends	-0.128	0.005	-0.069	0.14	-0.127	0.006	0.070	0.13	0.167	< 0.001
LGB patients*	0.025	0.68	0.051	0.40	-0.020	0.74	-0.053	0.38	0.123	0.04

* 4th to 6th year students (N = 291). FMUP: Faculty of Medicine, University of Porto; RP: Rejection of proximity; HP: Homosexuality pathologization; MH: Modern heterosexism; SP: Support.

Totals may not equal total sample because some students did not respond to all variable questions and sections.

significantly lower scores on RP (p = 0.04) and MH (p = 0.03) subscales, without significant differences in HP or SP. The number of LGB friends showed a negative correlation with negative attitudes: RP (ρ = -0.128; p = 0.005) and MH (ρ = -0.127; p = 0.006).

The number of LGB patients correlated moderately with year in medical course (ρ = 0.341; p < 0.001). Nevertheless, no significant differences on medical students' attitudes towards homosexuality were detected in relation to contact with LGB patients during clinical rotations. Also, the number of LGB patients did not show any significant correlation with the medical students' attitudes.

When comparing 'pre-clinical' and 'clinical' years, a significant difference was found in SP, the positive attitudinal dimension (p = 0.02), but not in PR, HP and MH, the negative dimensions. Year in medical course correlated significantly with the SP subscale scores (ρ = -0.123; p = 0.008).

Regarding the desired field of specialization, students that aspired to specialize in technique-oriented specialties presented significantly higher scores in MH subscale (p = 0.03) when compared to students that wanted to pursue patient-oriented specialties. No differences were found in the traditional expressions of homophobia (PR and HP) or

in the positive attitudinal dimension (SP) of MSATLG.

Section 3: Homosexuality Knowledge Questionnaire

The participants' average score of correct answers on the knowledge questionnaire was 9.13 [± 2.53]. The statement that most participants judged correctly was 'Homosexuals usually disclose their sexual identity to a friend before they tell a parent' (n = 415; 86.5%). The statement which obtained the lowest score was 'Lesbian women have a higher risk of obesity compared with straight women' (n = 7; 1.5%). In fact, items more related with LGB health showed the lowest number of correct answers in the questionnaire (Table 4). No student answered correctly to all of the questionnaire's items.

In the multivariable analysis of the Homosexuality Knowledge Questionnaire (Table 2), a statistically significant difference was found when overall scores were compared by year in medical course, with medical students in the 'clinical' years of the course having higher knowledge scores. Moreover, knowledge scores correlated significantly with year in medical course ($\rho = 0.229$; $p < 0.001$). Nevertheless, knowledge scores also correlated positively with increasing number of LGB friends ($\rho = 0.167$; $p < 0.001$) and increasing contact with LGB patients ($\rho = 0.123$; $p = 0.04$). On the other hand, religiosity correlated negatively with knowledge scores ($\rho = -0.151$; $p = 0.001$). When comparing per item (Table 5), female gender students had higher percentages of correct answers in items more related to common myths about homosexuality (e.g. items 12 and 13). Medical students from the 'clinical' years had higher percentages of correct answers on four items related to common myths about homosexuality and also on two items related to health disparities (items 7 and 16). Students that report to have

Table 4 - The Homosexuality Knowledge Questionnaire and the percentage of correct answers when applied to FMUP undergraduate medical students (n = 480) in 2016

Item/Sentence	Correct Answer	Correct No. (%)
1. The majority of homosexuals were seduced in adolescence by a person of the same sex, usually several years older.*	False	356 (74.2)
2. Sexual orientation is usually well-established by adolescence.*	True	121 (25.2)
3. Homosexuals usually disclose their sexual identity to a friend before they tell a parent.*	True	415 (86.5)
4. A homosexual person's gender identity does not agree with his/her biological sex.*	False	358 (74.7)
5. If children are raised by openly homosexual parents, the likelihood that they themselves will develop a homosexual orientation is greater than if they were raised by heterosexual parents.*	False	313 (65.2)
6. Homosexuals place more importance on the physical attractiveness of their dating partners than do heterosexuals.*	False	342 (71.4)
7. Prevalence of cervical cancer and dysplasia is equivalent among lesbians and heterosexual women.§	True	105 (21.9)
8. Lesbian women have a higher risk of obesity compared with straight women.†	True	7 (1.5)
9. Smoking prevalence is higher among the LGBT population than among the population as a whole.†	True	33 (6.9)
10. Gay men and lesbian women have an increased incidence of anxiety and depression compared to heterosexual men and women.*	True	181 (37.8)
11. In the last 25 years there has been an increase in homosexuality.*	False	191 (40.0)
12. Most homosexual men and women want to be heterosexual.*	False	349 (72.7)
13. Heterosexuals generally have a stronger sex drive than do homosexuals.*	False	371 (77.5)
14. Homosexuality does not occur among animals (other than human beings).*	False	370 (77.4)
15. Heterosexual men tend to express more hostile attitudes toward homosexuals than do heterosexual women.*	True	373 (77.7)
16. Gay men are at greater risk for anal cancer than straight men.†	True	222 (46.3)
17. Homosexuals are usually identifiable by their appearance or mannerisms.*	False	271 (56.5)

* from Dunjic-Kostic B, Pantovic M, Vukovic V, Randjelovic D, Totic-Poznanovic S, Damjanovic A, et al. Knowledge: a possible tool in shaping medical professionals' attitudes towards homosexuality. Psychiatr Danub. 2012;24:143-151.

§ from Sanchez NF, Rabatin J, Sanchez JP, Hubbard S, Kalet A. Medical students' ability to care for lesbian, gay, bisexual, and transgendered patients. Fam Med. 2006;38:21-7.

† from Hollenbach A, Eckstrand K, Dreger A. Implementing curricular and institutional climate changes to improve health care for individuals who are LGBT, gender nonconforming, or born with DSD. Association of American Medical Colleges; 2014.

Table 5 - Multivariable analysis of the Homosexuality Knowledge Questionnaire (n = 480) per sentence among FMUP undergraduate medical students in 2016

Item/Sentence		Gender			Year in medical course			LGB friends		
		Female	Male		Pre-clinical	Clinical		Yes	No	
		n (%)		*p*	n (%)		*p*	n (%)		*p*
	1.	246 (74.5)	110 (73.3)	0.779	130 (68.8)	226 (77.7)	0.030	278 (74.3)	77 (73.3)	0.837
	2.	76 (23.0)	45 (30.0)	0.103	45 (23.8)	76 (26.1)	0.569	92 (24.6)	29 (27.6)	0.529
	3.	290 (87.9)	125 (83.3)	0.177	157 (83.1)	258 (88.7)	0.080	331 (88.5)	83 (79.0)	0.012
	4.	250 (75.8)	108 (72.5)	0.445	123 (65.4)	235 (80.8)	< 0.001	279 (74.8)	78 (74.3)	0.915
	5.	225 (68.2)	88 (58.7)	0.042	119 (63.0)	194 (66.7)	0.405	255 (68.4)	56 (53.3)	0.004
	6.	238 (72.1)	104 (69.8)	0.603	136 (72.3)	206 (70.8)	0.714	269 (71.9)	73 (70.2)	0.729
	7.	79 (23.9)	26 (17.3)	0.105	32 (16.9)	73 (25.1)	0.035	85 (22.7)	20 (19.0)	0.421
	8.	2 (0.6)	5 (3.3)	0.033	2 (1.1)	5 (1.7)	0.709	4 (1.1)	2 (1.9)	0.617
	9.	22 (6.7)	11 (7.3)	0.796	15 (7.9)	18 (6.2)	0.465	24 (6.4)	9 (8.6)	0.445
	10.	116 (35.3)	65 (43.3)	0.091	69 (36.5)	112 (38.6)	0.641	140 (37.5)	40 (38.1)	0.916
	11.	122 (37.1)	69 (46.3)	0.056	74 (39.4)	117 (40.3)	0.830	151 (40.6)	39 (37.1)	0.524
	12.	253 (76.7)	96 (64.0)	0.004	123 (65.1)	226 (77.7)	0.002	274 (73.3)	74 (70.5)	0.571
	13.	265 (80.5)	106 (70.7)	0.016	133 (70.4)	238 (82.1)	0.003	292 (78.3)	79 (75.2)	0.508
	14.	242 (73.6)	128 (85.9)	0.003	143 (75.7)	227 (78.5)	0.461	293 (78.6)	76 (73.1)	0.238
	15.	256 (77.6)	117 (78.0)	0.918	142 (75.1)	231 (79.4)	0.274	294 (78.6)	78 (74.3)	0.347
	16.	157 (47.7)	65 (43.3)	0.372	69 (36.5)	153 (52.8)	< 0.001	174 (46.6)	47 (44.8)	0.732
	17.	184 (55.8)	87 (58.0)	0.646	102 (54.0)	169 (58.1)	0.375	213 (57.0)	57 (54.3)	0.626

FMUP: Faculty of Medicine, University of Porto; RP: Rejection of proximity; HP: Homosexuality pathologization; MH: Modern heterosexism; SP: Support.
Totals may not equal total sample because some students did not respond to all variable questions and sections.

Table 6 - Correlation between the Multidimensional Scale of Attitudes toward Lesbian and Gay Men and the Homosexuality Knowledge Questionnaire (n = 469) among FMUP undergraduate medical students in 2016

	Multidimensional Scale of Attitudes Toward Lesbian and Gay Men							
	RP		HP		MH		SP	
	Pearson	*p*	Pearson	*p*	Pearson	*p*	Pearson	*p*
Homosexuality Knowledge Questionnaire	-0.223	< 0.001	-0.240	< 0.001	-0.348	< 0.001	0.209	< 0.001

FMUP: Faculty of Medicine, University of Porto; RP: Rejection of proximity; HP: Homosexuality pathologization; MH: Modern heterosexism; SP: Support

LGB friends had higher percentages of correct answers on items related to sexual orientation disclosure and identity (items 3 and 5).

Higher scores in the Homosexuality Knowledge Questionnaire were associated with less negative attitudes towards homosexuality in all the four considered dimensions (Table 6): the strongest negative correlation was found with MH subscale (ρ = -0.348, p < 0.001).

DISCUSSION

Medical students' attitudes towards lesbians and gay men

Our results are in accordance with the literature that reports the strong influence of gender on attitudes towards homosexuality, with the male gender being consistently associated with more negative attitudes[27-31,33] both in traditional and modern forms of homophobia.[38] Indeed, male negative attitudes' towards homosexuality may be linked to their more normative views of the male gender roles.[29] Differently to other studies that applied the MSATLG to higher education students[38], we did not find any gender differences on the Homosexuality Pathologization (HP) subscale scores. These gender differences may have been eliminated by the scientific-academic background of our sample, composed exclusively of medical students. That is, independently of their gender participants might be aware of the de-pathologization of homosexuality.[1]

Religiosity correlated positively with both traditional and

modern forms of homophobia. In fact, religiosity seems to influence overall attitudes towards sexuality, with less religious students being more tolerant towards sexuality topics.[25,35] Our data also suggests that having LGB friends reduces homophobia, since it correlates negatively with both traditional and modern attitudinal dimensions.[36,37] These findings are in accordance with studies reporting that students with homosexual friends acquire more positive attitudes and may hold less stigmatizing attitudes even prior to the medical school.[29,30]

In recent studies, the frequency of clinical encounters with LGBT patients showed as a predictor of less negative attitudinal scores[26,27] which was not verified in our study. Even so, it is important to highlight that in our sample the majority of students (60%) did not have any contact with patients that identified as LGB. In fact, heterosexist assumptions in healthcare might reduce physicians/tutors and medical students' attention to patients' sexual orientation, discouraging patients' disclosure.[4,6,23]

We expected that students' in more advanced years in the medical course would be less homophobic and more prone to embrace patient's diversity.[28,31,41] Rather, our results show that medical students' scores in the negative attitudinal dimensions are not influenced by the year in medical course. Surprisingly, students seem to become less supportive of homosexuality, as shown by the lower scores in the positive attitudinal dimension. A heteronormative healthcare environment might again explain this finding, in which medical students become less sensitive to patients diverse sexual orientation visibility as they have more experience in clinical settings. Other studies on medical students and training physicians may elucidate this finding.

Smith and Mathews reported that the least homophobic specialties were psychiatry, internal medicine and paediatrics, while the most homophobic physicians were surgeons, orthopaedic surgeons and family doctors.[21] In our study, that used the person-oriented versus technique-oriented taxonomy, although no differences were observed on traditional homophobia expressions, students pursuing technique-oriented specialties expressed higher levels of modern heterosexism. Thus, after being integrated in a specialty such as surgery or orthopaedics, where senior physicians might undervalue inclusiveness in healthcare and/or endorse homophobic/heterosexist perspectives, the negative attitudes towards homosexuality may be favoured and amplified.[28] Further studies should be conducted to investigate the association between specialty choice and prejudice, given that homophobia in healthcare may also affect medical students choices: studies report that homosexuality could be a barrier to pursuit some medical specialties[21] and that students consider how physicians might accept lesbians or gay men colleagues when deciding on a specialty.[42]

Medical students' knowledge on homosexuality

Overall, medical students showed reasonable knowledge on homosexuality, with greater knowledge scores being associated with progression in the medical course, contact with LGB patients and LGB friends, and low religiosity.[27,28] In our study, no differences were found when comparing by gender or specialty group. Importantly, topics more related to health disparities showed the lowest number of correct answers and thus may deserve more attention in the medical curriculum. Similar results were also reported in a study conducted by Sanchez *et al*.[27]

Although the positive correlation with year in medical course may translate the presence of LGB content in the Faculty's formal curriculum, the acquisition of information through non-formal settings, such as the social media or LGB friends could also explain the observed association.[27] Moreover, the fact that statements closely related to health collected the lower number of correct answers and that knowledge improves with the increasing number of LGB friends, both favour the latter explanation.[27] However, it is important to consider that some participants might have interpreted the health items as implying that the differences were inherent to sexual orientation and disagreed even if they were aware of a statistical difference in the known populations.

In accordance to other studies[18,28,31] we also identified a correlation between attitudes and knowledge on homosexuality. Even so, given that in our study, regardless of gender or year in medical course, more than three quarters of students were aware of the gender differences on attitudes towards homosexuality (Homosexuality Knowledge Questionnaire, item 15) and that that attitudinal difference was still found, improving students' knowledge on homosexuality by itself may not be enough to change their attitudes. Other strategies, such as reflection on personal beliefs and attitudes towards homosexuality and homosexual patients, using clinical cases, simulations or lectures with LGBT faculty members, may help to challenge prejudice and increase medical students comfort in providing care to this population, and so should also be considered in the formal medical undergraduate curricula.[5,13,22-24,26]

Limitations

Some limitations should be taken into consideration when analysing our results. First, our population was limited to FMUP medical students', and although it is an important needs assessment for this medical school, the results cannot be generalized to the Portuguese population of medical students.

Secondly, a selection bias may be present with an overrepresentation of students that have more knowledge and positive attitudes towards homosexuality. Actually, the proportion of respondents who self-identified as homosexual (8%) or bisexual (5.5%) in our sample was higher than in similar studies.[27,29,31] Moreover, the overall attitudes expressed by male students could have been attenuated by the high percentage of male students that identified as homosexual or bisexual (n = 53; 34.4%). Nonetheless, it increases the likelihood of a type II error, which does not invalidate the results. Also, since homosexuality is a

sensitive topic, participants may have presented themselves as more inclusive and tolerant, and this social desirability effect may have hidden part of the differences found in our work. Notwithstanding the importance of measuring medical students' attitudes, there is no clear understanding on assuming that their negative attitudes towards homosexuality may jeopardize homosexual patients' care. Nevertheless, even unconscious modern expressions of homophobia can impede the adoption of a supportive and nonjudgmental attitude toward LGB patients and contribute to this population's health disparities and 'invisibility' in healthcare services.

To our knowledge, this is the first study exploring medical students' knowledge and attitudes towards homosexuality in Portugal, and despite its limitations, it highlights the importance of curriculum enhancement in LGB health in physicians' training. Although progress in Portugal is occurring regarding LGBT rights acknowledgment,[7-9] the same may not be happening in the healthcare system.[10] In this way, the implementation of curricular content that promotes inclusiveness and enhance medical students' knowledge and comfort to address homosexuality in the clinical setting is of great importance.[6,23,24,43]

Concluding, this study suggests that there may be a lack of exploration of medical students' personal attitudes towards lesbians and gay men, and also a lack of knowledge on LGB specific healthcare needs. Healthcare professionals' education should be promoted in order to enhance the inclusiveness of healthcare regarding LGBT people. Thus, the development of inclusive undergraduate curricula is essential so that medical students receive adequate training to counter heterosexuality assumptions.

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PROTECTION OF HUMANS AND ANIMALS

Ethical approval has been granted by the Ethics Committee for Health at Hospital São João / Faculty of Medicine, University of Porto. The authors declare that the procedures were followed according to the Helsinki Declaration of the World Medical Association.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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