Lesbian, Gay, Bisexual, and Transgender–Related Content in Undergraduate Medical Education

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ESBIAN, GAY, BISEXUAL, AND transgender (LGBT) individuals have specific health and health care needs relating to chronic disease risk, 1 adult and adolescent mental health, 2-5 unhealthy relationships (eg, intimate partner violence), 6 gender identity, 7 sexually transmitted infections, 8,9 and human immunodeficiency virus infection, 10 among others. Compared with heterosexual and nontransgender socioeconomically matched peers, LGBT individuals are more likely to face barriers accessing appropriate medical care, which may create or increase existing disparities. 11 A 2011 Institute of Medicine (IOM) report on the health of LGBT individuals noted that “although LGBT people share with the rest of society the full range of health risks, they also face a profound and poorly understood set of additional health risks due largely to social stigma.” 12 In a 2007 survey of

Context Lesbian, gay, bisexual, and transgender (LGBT) individuals experience health and health care disparities and have specific health care needs. Medical education organizations have called for LGBT-sensitive training, but how and to what extent schools educate students to deliver comprehensive LGBT patient care is unknown.

Objectives To characterize LGBT-related medical curricula and associated curricular development practices and to determine deans’ assessments of their institutions’ LGBT-related curricular content.

Design, Setting, and Participants Deans of medical education (or equivalent) at 176 allopathic or osteopathic medical schools in Canada and the United States were surveyed to complete a 13-question, Web-based questionnaire between May 2009 and March 2010.

Main Outcome Measure Reported hours of LGBT-related curricular content.

Results Of 176 schools, 150 (85.2%) responded, and 132 (75.0%) fully completed the questionnaire. The median reported time dedicated to teaching LGBT-related content in the entire curriculum was 5 hours (interquartile range [IQR], 3-8 hours). Of the 132 respondents, 9 (6.8%; 95% CI, 2.5%-11.1%) reported 0 hours taught during preclinical years and 44 (33.3%; 95% CI, 25.3%-41.4%) reported 0 hours during clinical years. Median US allopathic clinical hours were significantly different from US osteopathic clinical hours (2 hours [IQR, 0-4 hours] vs 0 hours [IQR, 0-2 hours]; P = .008). Although 128 of the schools (97.0%; 95% CI, 94.0%-99.9%) taught students to ask patients if they “have sex with men, women, or both” when obtaining a sexual history, the reported teaching frequency of 16 LGBT-specific topic areas in the required curriculum was lower: at least 8 topics at 83 schools (62.9%; 95% CI, 54.6%-71.1%) and all topics at 11 schools (8.3%; 95% CI, 3.6%-13.0%). The institutions’ LGBT content was rated as “fair” at 58 schools (43.9%; 95% CI, 35.5%-52.4%). Suggested successful strategies to increase content included curricular material focusing on LGBT-related health and health disparities at 77 schools (58.3%; 95% CI, 49.9%-66.7%) and faculty willing and able to teach LGBT-related curricular content at 67 schools (50.8%, 95% CI, 42.2%-59.3%).

Conclusion The median reported time dedicated to LGBT-related topics in 2009-2010 was small across US and Canadian medical schools, but the quantity, content covered, and perceived quality of instruction varied substantially.

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736 California physicians (13% response rate), 18.3% of respondents were “sometimes” or “often” uncomfortable providing care to gay patients. The Association of American Medical Colleges (AAMC) has recommended that “medical school curricula ensure that students master the knowledge, skills, and attitudes necessary to provide excellent, comprehensive care for [LGBT] patients” by including “comprehensive content addressing the specific healthcare needs of [LGBT] patients” and “training in communication skills with patients and colleagues regarding issues of sexual orientation and gender identity.”

The current breadth and depth of LGBT health–related curricula in medical schools is unknown. Therefore, we investigated the presence of LGBT-related curricular content, the number of hours taught, coverage of specific LGBT-related topics, methods for evaluating LGBT-related curricula, strategies to increase LGBT-related content, and deans’ opinions of their institutions’ LGBT-related content.

METHODS

Study Design

This study was a cross-sectional Internet-based survey, primarily designed to be hypothesis generating. The study was approved by the Stanford University Administrative Panel on Human Subjects in Medical Research.

To inform the study design, we searched the MEDLINE database for all English-language publications containing lesbian, gay, homosexual, bisexual, transgender, medical education, medical student, and curriculum in the title, abstract, or both along with related Medical Subject Headings to identify previous LGBT health-related medical education studies and their study designs.

Internet-based questionnaires were distributed between May 2009 and March 2010 to deans of medical education (or other lead curriculum administrators) at all 148 allopathic medical schools (17 Canada, 131 United States) and all 28 osteopathic medical schools in the United States enrolling students at survey initiation. The AAMC, the American Association of Colleges of Osteopathic Medicine (AACOM), members of the AAMC Group on Student Affairs–Committee on Diversity Affairs, and the authors distributed initial invitations via e-mail. Repeated contacts with nonrespondents were made 3 times per medium (e-mail, post, and telephone).

Questionnaires were administered via Opinio (ObjectPlanet Inc, Oslo, Norway) with 128-bit secure sockets layer (SSL) encryption, in compliance with the United States Health Information Protection and Portability Act (HIPAA). Informed consent was obtained prior to questionnaire access. Only 1 answered questionnaire was requested from each institution. Software permitted respondents to complete questionnaire sections and forward the questionnaire to other knowledgeable respondents, allowing collaborative responses. To encourage candor and ensure confidentiality, all responses were collected without individual names and school identities were kept confidential.

Questionnaire Design

In conjunction with other resources, the MEDLINE search was also used to determine which LGBT health-related topics to include in the questionnaire. The final 16 topics (eAppendix [available at http://www.jama.com], item 8) were not meant to be exhaustive, but representative of potentially critical features of LGBT experiences that affect health and to which students may be exposed. The final topic list was validated by a panel of LGBT health and community health experts for accuracy, timeliness, and current priorities regarding health issues affecting LGBT communities. A drafted questionnaire was piloted with 13 deans of medical education.

The final 13-item questionnaire (eAppendix) was designed to be completed in 15 minutes. Two of the 13 items allowed for free-text input in addition to multiple-choice selections.

Outcomes

The primary outcome was defined as the number of LGBT-related content hours in the medical curricula. Secondary outcomes included frequency of institutional instruction in 16 different LGBT health areas, extent of coverage in each area, methods of evaluating LGBT-related content learning, and strategies for increasing LGBT-related content.

Data Coding and Preparation for Analysis

After completion of the data collection, questionnaires were independently coded by 2 investigators blinded to the name of the institution and following the metrics for Internet surveys proposed by the American Association for Public Opinion Research (AAPOR). A third investigator reconciled discordant coding. For completed questionnaires (AAPOR code 1.1), there was 100% agreement between coders. Overall (including all AAPOR codes), 6 questionnaires had discordant coding that were reconciled by the third coder. When multiple questionnaires were returned from an institution, the most reliable questionnaire was selected by the presence of a response to the primary outcome question and the fewest “don’t know” and “decline to answer” responses.

Statistical Analysis

Completed questionnaires (AAPOR code 1.1, n=132) were used in the statistical analyses. Separate analyses including incomplete questionnaires that answered the primary outcome question (AAPOR code 1.2) and incomplete questionnaires that did not answer the primary outcome question (AAPOR code 2.1) were performed; there was no difference in statistically significant results when incomplete questionnaires were included. For all
other descriptive statistics, inclusion of incomplete questionnaires resulted in changes of no more than 2%. “Don’t know” responses for either preclinical or clinical hours precluded inclusion in calculations of combined hours and all other hours-related statistical analyses. Differences in preclinical vs clinical hours for all schools were compared using the Wilcoxon signed rank test. Institutions were also categorized by country/degree type (Canadian allopathic, US allopathic, US osteopathic) and public/private institutional affiliation (Canadian schools omitted because all are public).

The Kruskal-Wallis test compared the reported preclinical, clinical, and combined hours among these categories. Due to unequal group sizes and large standard deviations between groups, medians were compared, but mean values for curricular hours were also calculated for comparison with previous studies. Violations of assumptions necessary for parametric tests necessitated nonparametric testing. \( \chi^2 \) values for Kruskal-Wallis tests were reported. Posthoc pairwise Mann-Whitney \( U \) tests with Bonferroni correction for multiple testing were performed on categories with significant \( P < .05 \) Kruskal-Wallis results; Bonferroni-adjusted \( \alpha \) was reported when the correction was used. Fisher exact test compared schools teaching 0 vs more than 0 clinical hours. Descriptive statistics were calculated using Microsoft Excel 2003 (Microsoft Corp, Redmond, Washington). All other statistical analyses were performed using R version 2.13.0 (The R Foundation for Statistical Computing, Vienna, Austria).

**RESULTS**

**Characterization of Respondents and Nonrespondents**

Of 176 medical schools in Canada and the United States, 150 (85.2%) responded. Of these, 132 (88.0% of respondents, 75.0% response rate overall) fully completed the questionnaire. Further categorization is given in eTable 1.

**Hours of LGBT-Related Curricular Content**

The median reported combined hours dedicated to LGBT content was 5 hours (interquartile range [IQR], 3-8 hours, range, 0-32 hours; Table 1). The corresponding mean (SD) value was 7.0 hours (6.5). Overall, preclinical hours were significantly greater than the clinical hours (4 hours; IQR, 2-6 hours vs 2 hours; IQR, 0-3 hours; \( P < .001 \)). Additional characterization of reported preclinical, clinical, and combined hours dedicated to LGBT-related content is presented in Table 1.

Forty-four medical schools (33.3%; 95% CI, 25.3%-41.4%) reported 0 hours of LGBT content during clinical years (eTable 2), 9 (6.8%; 95% CI, 2.5%-11.1%) reported 0 hours during preclinical years, and 5 (3.8%; 95% CI, 0.5%-7.0%) reported 0 combined hours. Significant country/degree type differences were noted: the number of Canadian allopathic schools (6/11; 54.5%; 95% CI, 41.5%-84.8%) and US osteopathic schools (12/19; 63.2%; 95% CI, 41.5%-84.8%) with 0 clinical hours was significantly higher than the number of US allopathic schools (26/102; 25.5%; 95% CI, 17.0%-33.9%) with 0 clinical hours (\( P = .001 \), Fisher exact test).

Median reported preclinical hours did not vary significantly by public/private affiliation or country/degree type (\( \chi^2 = 1.60, P = .21 \) and \( \chi^2 = 0.45, P = .80 \), respectively). Median reported clinical hours varied significantly among all 3 country/degree types (\( \chi^2 = 10.69, P = .005 \)) but not by public/private affiliation (\( \chi^2 = 0.53, P = .46 \)). US osteopathic schools had significantly fewer median reported

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**Table 1. Preclinical, Clinical, and Combined Hours Dedicated to LGBT-Related Topics in US and Canadian Medical Schools**

<table>
<thead>
<tr>
<th></th>
<th>Preclinical</th>
<th>Clinical</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median (IQR) [Range]</td>
<td>P Value</td>
<td>Median (IQR) [Range]</td>
</tr>
<tr>
<td>All</td>
<td>4 (2-6) [0-24]a</td>
<td>2 (0-3) [0-15]a</td>
<td>5 (3-8) [0-32]</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States (n = 121)</td>
<td>4 (2-6) [0-24]</td>
<td>.58</td>
<td>2 (0-4) [0-15]</td>
</tr>
<tr>
<td>Canada (n = 11)</td>
<td>4 (2-5.5) [0-13]</td>
<td></td>
<td>0 (0-2) [0-3]</td>
</tr>
<tr>
<td>Country and degree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US allopathic (n = 102)</td>
<td>4 (2-5.5) [0-24]</td>
<td>.80</td>
<td>2 (0-4) [0-15]b</td>
</tr>
<tr>
<td>US osteopathic (n = 19)</td>
<td>4 (2-8) [0-10]</td>
<td></td>
<td>0 (0-2) [0-10]c</td>
</tr>
<tr>
<td>Canadian allopathic (n = 11)</td>
<td>4 (2-5.5) [0-13]</td>
<td></td>
<td>0 (0-2) [0-3]</td>
</tr>
<tr>
<td>US institution type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private (n = 52)</td>
<td>4 (2-6) [0-20]</td>
<td>.21</td>
<td>1 (0-4) [0-15]</td>
</tr>
<tr>
<td>Public (n = 69)</td>
<td>3 (2-5) [0-24]</td>
<td></td>
<td>2 (0-3) [0-10]</td>
</tr>
</tbody>
</table>

Abbreviations: IQR, interquartile range; LGBT, lesbian, gay, bisexual, and transgender.

aP = .001 for preclinical vs clinical hours.

bP = .008, Bonferroni-adjusted \( \alpha = .017 \).

cOnly the comparison of US osteopathic schools with US allopathic schools was statistically significant.

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clinical hours than US allopathic schools (0 hours; IQR, 0-2 hours vs 2 hours; IQR, 0-4 hours; \( P = .008 \); Bonferroni-adjusted \( \alpha = .017 \)), but there was no significant difference with correction for multiple testing between US allopathic and Canadian schools (0 hours; IQR, 0-2 hours) or between US osteopathic and Canadian schools (0 hours; IQR, 0-2 hours) or (\( P = .03 \) and .79, respectively; Bonferroni-adjusted \( \alpha = .017 \) for both).

**Coverage of LGBT-Related Topics**

Of the 132 respondents, 128 (97.0%; 95% CI, 94.0%-99.0%) reported that their institution teaches medical students to ask patients if they have sex with men, women, or both when obtaining a sexual history. A total of 95 schools (72.0%; 95% CI, 64.3%-79.6%) reported teaching students the difference between behavior and identity (eg, men may have sex with men and identify as straight), and 28 schools (21.2%; 95% CI, 14.2%-28.2%) did not know whether this difference was taught.

Deans indicated the presence or absence of 16 LGBT-related topics in their required or elective curricula (Figure 1). Of the 132 schools that responded completely, 83 (62.9%; 95% CI, 54.6%-71.1%) reported teaching at least half of the 16 topics and 11 (8.3%; 95% CI, 3.6%-13.0%) reported teaching all 16 of the topics in their required curriculum (Figure 2). When elective curricula are considered along with required curricula, 99 schools (75.0%; 95% CI, 67.6%-82.4%) teach at least half of the 16 topics (eFigure 1). Additional LGBT-related topics taught at individual schools include discrimination against LGBT individuals, LGBT parenting, and interviewing LGBT patients (eTable 3).

Deans evaluated their institutions’ levels of coverage of the same 16 LGBT-related topics. The percentage of deans reporting “too little coverage” of these topics varied from 12.9% for “HIV in LGBT people” to 35.6% for “LGBT adolescent health” (eFigure 2). Deans also evaluated the quality of their schools’ coverage of LGBT-related content overall. The most common response was “fair” in 58 schools (43.9%; 95% CI, 35.5%-52.4%), while nearly equal numbers evaluated coverage as “very good” or “good” (32; 24.2%; 95% CI, 16.9%-31.6%) and “very poor” or “poor” (34; 25.8%; 95% CI, 18.3%-33.2%).

**Methods of Teaching LGBT-Related Topics**

LGBT-related preclinical content was mostly reported as “interspersed throughout various parts of the curriculum” (88 schools; 66.7%; 95% CI, 58.6%-74.7%), followed by “taught in
discrete modules dedicated to LGBT content” (32 schools; 24.2%; 95% CI, 16.9%-31.6%). A majority of respondents (79 schools; 59.8%; 95% CI, 51.5%-68.2%) used lectures or small groups to teach LGBT-related topics in a clinical setting. LGBT-focused clinical sites were not offered in 103 schools (78.0%; 95% CI, 71.0%-85.1%), required in 7 schools (5.3%; 95% CI, 1.5%-9.1%), and available as electives in 12 schools (19.1%; 95% CI, 4.2%-14.0%). The various types of LGBT-focused clinical sites offered by respondents are shown in eTable 4. Faculty development for teaching LGBT-related content was offered at 27 schools (20.5%; 95% CI, 13.6%-27.3%).

Methods for Evaluating and Improving LGBT-Related Content

“Written examinations” were the most frequently used method to evaluate teaching of LGBT topics (73 schools; 55.3%; 95% CI, 46.8%-63.8%). Other methods included “evaluation by standardized patients” (46 schools; 34.8%; 95% CI, 26.7%-43.0%) and “faculty-observed patient interactions” (42 schools; 31.8%; 95% CI, 23.9%-39.8%). Of the schools, 38 (28.8%; 95% CI, 21.1%-36.5%) did not evaluate teaching of LGBT topics.

The most popular strategies recommended or present for increasing LGBT content in the curricula included “curricular material focusing on LGBT-related health and health disparities” and having “faculty willing and able to teach LGBT-related curricular content” (Table 2).

COMMENT

This study provides a contemporary estimate of required medical school curricular time used for education in LGBT-related content. In comparison, previous studies were limited in scope and depth.17,18 The most comprehensive study was a 1992 cross-sectional survey based on a questionnaire administered to US medical school psychiatry departments, which reported a 65% (n=82) response rate and a mean of 3.43 hours “devoted to the topic of homosexuality” that were primarily taught during human sexuality lectures.17 A 1998 cross-sectional survey of 116 US family medicine course directors had an 82% (n=95) response rate and reported a mean of 2.5 hours on the topic of “homosexuality and bisexuality;” with more than 50% reporting 0 hours.18

Neither article studied curricular content throughout undergraduate medical education. Based on the median of 5 hours (and mean of 7.0 hours) in our study, the number of reported LGBT-related curricular hours appears to have increased since 1992. However, direct comparison is difficult given differing methods and sampling. In addition, substantial variations exist among institutions, ranging from 0 to 32 combined preclinical and clinical hours.

Although our assessment tool likely does not capture all LGBT-related clinical instruction, which may occur in either a spontaneous or intentional fashion, 33.3% of allopathic and osteopathic schools in Canada and the United States reported 0 required clinical hours for LGBT content. Previous studies demonstrate positive association of student knowledge and attitudes with exposure to LGBT individuals and their personal narratives in discrete modules,19,20 but the effectiveness of interspersed LGBT-specific curricular content has not been evaluated.

Although the majority of schools teach at least half of the 16 LGBT-related topic areas within their required curricula, very few reported covering all 16. Elective curricula provide a venue for teaching some of this content, albeit with a limited audience. A minority of schools reported covering topics in the required curriculum that are related to primary care in LGBT communities (eg, chronic disease risk, unhealthy relationships, coming out, substance use, adolescent health, body image) or transgender-specific care (eg, transitioning, sex reassignment surgery). A substantial number of deans evaluated some of these topics as receiving too little coverage at their institutions.

The 2008-2009 Liaison Committee on Medical Education (LCME) Part II Annual Medical School Questionnaire found that 116 of 126 schools (92.1%) reported that “training in the sexual history includes information about gay, lesbian, bisexual, and transgender patients,” and 43 of 126 schools (35.7%) reported addressing “hormonal and surgical treatment and transition related to transgender patients” (B. Barzan-

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Table 2. Strategies Cited As Currently or Potentially Successful in Increasing LGBT-Related Content in Curricula (N = 132)

<table>
<thead>
<tr>
<th>Strategya</th>
<th>No. (%) [95% CI] of Responses</th>
</tr>
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<tbody>
<tr>
<td>Curricular material focusing on LGBT-related health/disparities</td>
<td>77 (58.3) [49.9-66.7]</td>
</tr>
<tr>
<td>Faculty willing and able to teach LGBT-related curricular content</td>
<td>67 (50.8) [42.2-59.3]</td>
</tr>
<tr>
<td>More time in the curriculum to be able to teach LGBT-related content</td>
<td>63 (47.7) [39.2-56.2]</td>
</tr>
<tr>
<td>More evidence-based research regarding LGBT health/disparities</td>
<td>61 (46.2) [37.7-54.7]</td>
</tr>
<tr>
<td>Questions based on LGBT health/disparities on national examinations (eg, USMLE)</td>
<td>60 (45.5) [37.0-53.9]</td>
</tr>
<tr>
<td>Curricular material coverage required by accreditation bodies</td>
<td>60 (45.5) [37.0-53.9]</td>
</tr>
<tr>
<td>Methods to evaluate LGBT curricular content</td>
<td>58 (43.9) [35.5-52.4]</td>
</tr>
<tr>
<td>Logistical support for teaching LGBT-related curricular content</td>
<td>40 (30.3) [22.5-38.1]</td>
</tr>
<tr>
<td>Increased financial resources</td>
<td>35 (26.5) [19.0-34.0]</td>
</tr>
</tbody>
</table>

Abbreviations: CI, confidence interval; LGBT, lesbian, gay, bisexual, and transgender; USMLE, United States Medical Licensing Examination.

aResponses are from question 13: “What strategies do you think are or would be successful in increasing LGBT-specific content at your institution?” (eAppendix).
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sky, PhD, MHPE; Secretary, LCME; written communication, September 29, 2010). These percentages align with our data that 97.0% of schools report teaching students to ask if patients have “sex with men, women, or both” when obtaining a sexual history. 30.3% report teaching about gender transitioning, and 34.8% report teaching about sex reassignment surgery.

Nearly all respondents indicated that students were taught to obtain information about same-sex relations (eg, asking “do you have sex with men, women, or both?”). However, fewer institutions taught students to differentiate between behavior and identity. Discordant behavior and identity (eg, men who have sex with men and identify as straight) may pose challenges to appropriate clinical counseling.21 It is possible that students are taught to initiate sensitive conversations but lack the breadth of training to continue them in meaningful ways.

Only 24.2% of respondents rated their schools’ overall coverage of LGBT-related curricular material as “good” or “very good” on a 5-category Likert scale. This indicates dissatisfaction with medical school coverage of LGBT content at a number of schools, especially given the expected positive skew associated with survey self-reporting,22 and suggests room for improvement in LGBT-related curricula. Several schools did provide free-text responses describing sophisticated extant content.

Most respondents cited more curricular materials on LGBT health disparities and more willing faculty as currently or potentially successful methods of increasing LGBT-related content at their institutions. The 2011 IOM report to the National Institutes of Health (NIH) recommended focused intra- and extramural research efforts to build an LGBT health evidence base, increased demographic data on LGBT individuals, standardized sexual orientation/gender identity measures, and improved research methods for conducting LGBT health research.13 In addition to augmenting the available materials for instruction, the IOM report and allied efforts may help direct NIH funding to address the minority of institutions that currently offer faculty development on the subject.

Our study has several strengths that support the validity of the findings and suggest future research. First, we had high participation and completion rates, although it remains possible that the results may not be generalizable to all medical schools. Second, the respondents (deans of medical education or curricular officials) should have been the most knowledgeable officials at the institutions regarding questionnaire content, helping provide accurate detail of the institutions’ curricula. Third, we attempted to minimize response biases and effect of social desirability by assuring respondent and institutional confidentiality. Fourth, we completed this survey over 1 academic year to minimize variation in curricula over the study period.

Our study has several potential limitations. The use of reported instructional hours as a metric likely underestimated the total relevant curricular content due to the inability of a single quantitative measure to evaluate certain forms of teaching instruction (such as problem-based learning or the use of standardized patients in a clinical skills course) and particularly the more subtle and integrated nature of clinical teaching. Because preclinical curricular content is more frequently and easily indexed and standardized than clinical content, the questionnaire may have been more effective in capturing reported preclinical hours. However, reported hours of instruction remain a uniform means of curricular comparison (used by the AAMC Curriculum Management and Information Tool) and are used by medical school accreditation bodies. Previous studies have used reported hours as an important quantitative measure across nonstandardized curricula.17,18

Inaccurate recall and information biases may be present, reflecting the heterogeneity of instructors and materials over time. The number of instructional hours may not necessarily correlate with the breadth or efficacy of instruction. This study did not assess knowledge, attitudes, or skills; rather, it was designed to assess exposures to topics on a national level. Further work describing the effectiveness of such teaching in enhancing trainees’ skills is warranted.

CONCLUSION

The median reported time dedicated to LGBT-related content in medical school in 2009-2010 was 5 hours, but the number of hours in the required curriculum, as well as number of LGBT-related topics covered, varied widely. In many schools, deans of medical education endorsed dissatisfaction with their institutions’ coverage of LGBT-related topics and provided potential strategies for increasing curricular content.

Author Contributions: Drs Obedin-Maliver and Lunn had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Ms Goldsmith and Dr Stewart contributed equally to this article.

Study concept and design: Obedin-Maliver, Goldsmith, Stewart, Tran, Fetterman, Garcia, Lunn.

Acquisition of data: Goldsmith, Stewart, White, Tran, Brennan, Wells.

Analysis and interpretation of data: Obedin-Maliver, Goldsmith, Stewart, White, Brennan, Wells.

Statistical analysis: Goldsmith, White.

Acquisition of funding: Obedin-Maliver, Goldsmith, Stewart, White, Brennan, Wells.

Critical revision of the manuscript: Obedin-Maliver, Goldsmith, Stewart, White, Tran, Brennan, Wells, Fetterman, Garcia, Lunn.

Obtained funding: Obedin-Maliver, Goldsmith, Stewart, Garcia, Lunn.

Study supervision: Obedin-Maliver, Fetterman, Garcia, Lunn.

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Previous Presentations: Preliminary data were presented, in part, at the Association of American
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Medical Colleges’ (AAMC) Group on Student Affairs, Group on Diversity and Inclusion, and Organization of Student Representatives National Spring Meeting, Austin, Texas, April 17–21, 2010; the 28th Annual Conference of the Gay and Lesbian Medical Association, San Diego, California, September 22–25, 2010; The Research in Medical Education section of the AAMC Annual Meeting, Washington, DC, November 5–10, 2010; and the Western Regional Conference of the AAMC’s Group on Educational Affairs and Group on Student Affairs, Stanford, California, May 2, 2011.


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6. Kulkin HS, Williams J, Borne HF, de la Bretonne D, Kulkin HS, Williams J, Borne HF, de la Bretonne D, M. Brownell Anderson, MEd, AAMC, provided discussions and review of this study. The following individuals and their respective organizations provided written support of the study: Lily May Johnson, MD, and Karen A. Lewis, MS, AAMC Group on Student Affairs, Committee on Diversity Affairs; Rebecca Allison, MD, Jon D. Farrington, MS, and Michael Kutnick, BA, American Medical Association, Advisory Committee on GLBT Issues; and Jim Beaudreau, MPA, Joel Ginsberg, JD, MBA, and Jason Schneider, MD, Gay & Lesbian Medical Association. The following individuals and their respective organizations provided assistance with distributing the questionnaire invitation to their constituent populations: Ann Steinecke, PhD, AAMC; Ronald Garcia, PhD, Stanford University School of Medicine; Lily May Johnson, MD, and Karen A. Lewis, MS, AAMC Group on Student Affairs, Committee on Diversity Affairs; Thomas Levitan, MD, and Gina M. Moses, MD, American Association of Colleges of Osteopathic Medicine. All individuals acknowledged herein received no compensation for their role in this study.

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