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Getting Sexual and Gender Minority Health "Into the Brick and Mortar": A Mixed Methods Implementation Study

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Getting Sexual and Gender Minority Health "Into the Brick and Mortar": Results from a Mixed Methods Implementation Study

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ABSTRACT

Sexual and gender minorities (SGM) have unique health risks and health care needs, but medical students receive little training on SGM health (Obedin-Maliver, et al., 2011). This mixed methods study sought to learn from curricular champions in diverse settings to apply lessons learned at the George Washington University (GW). Exploratory models that included eight potential predictor variables for six criterion variables were tested using multiple linear regression. Criterion variables were: knowledge, attitudes, and clinical preparedness measured by the Lesbian, Gay, Bisexual, and Transgender Development of Clinical Skills Scale (LGBT-DOCSS; Bidell, 2017); attitudes measured by the Attitudes Toward LGBT Patients Scale (ATLPS; Wilson et al., 2014); and beliefs and behaviors measured by the Gay Affirming Practice Scale (GAPS; Crisp, 2006). Models were reduced for each criterion variable until all independent variables in the model explained >2% variance in the sample. Reduced Models explained approximately half of the total variance in the sample for three of the six criterion variables. All independent variables that were tested were included in at least one Reduced Model—suggesting that sociodemographic factors and lived experiences influence medical student competency in caring for SGM patients. Qualitative findings emphasized the importance of empowered, motivated individuals; institutional support; and inclusive planning and implementation processes. Engaging key stakeholders at GW to improve coverage of unique SGM health along with enhanced experiential opportunities would strengthen GW medical school student preparedness to care for SGM patients.

DEDICATION

I dedicate this work to my mother. She taught me how to learn.

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LIST OF ABBREVIATIONS

AAMC: Association of American Medical Colleges

AHRQ: Agency for Healthcare Research and Quality

APA: American Psychological Association

ART: Antiretroviral Therapy

ATLPS: Attitudes toward LGBT Patients Scale

BMI: Body Mass Index

CFIR: Consolidated Framework for Implementation Research

DSD: Disorders of Sex Development or intersex

FtM: Female-to-male transgender person or trans male

GAPS: Gay Affirming Practice Scale

GLMA: Gay and Lesbian Medical Association

GW: The George Washington University

HIV: Human Immunodeficiency Virus

HEI: Healthcare Equality Index

HRC: Human Rights Campaign

HHS: Health and Human Services

IOM: Institute of Medicine

LGBT-DOCSS: LGBT Development of Clinical Skills Scale

LGBTQI: Lesbian, gay, bisexual, transgender, queer and intersex

MAP: Movement Advancement Project

MSM: Men who have sex with men

MtF: Male-to-female transgender person or trans female

NAS: National Academies of Science

PA: Physician Assistant

PCRS: Physician Competency Reference Set

NASEM: National Academies of Science, Engineering, and Medicine

SGM: Sexual and gender minorities

SMHS: School of Medicine and Health Sciences

TACCT: Tool for Assessing Cultural Competence Training

WHO: World Health Organization

WSW: Women who have sex with women

CHAPTER 1: INTRODUCTION

Background and Overview

Lesbian, gay, bisexual, transgender, queer, and intersex people—inclusively termed "sexual and gender minorities" (SGM)—have unique health and health care needs that are not being met by most healthcare providers (Obedin-Maliver et al., 2011). Emerging research has demonstrated poorer health promotion behaviors, health care avoidance, and health disparities among SGM due to chronic social stigma and past or anticipated discrimination, including outright denial of care (Dowshen, Gilbert, Feiler, & Lee, 2013; McPhail, Rountree-James, & Whetter, 2016; Hollenbach, Eckstrand, & Dreger, 2014). Lack of healthcare provider cultural and clinical competence—including knowledge of and attitudes toward SGM, culturally-affirming behaviors, and clinical management strategies—have a direct impact on SGM patient experiences with health care, healthcare seeking behaviors, and health outcomes.

The World Health Organization (WHO) (2013) describes health care for SGM as inadequate: "Few healthcare providers or practitioners can provide adequate information, let alone comprehensive, safe and appropriate services" (p. 2). The WHO suggests that "[b]etter knowledge, understanding and coordination can pave the way for improving provider attitudes and education, the overall health care environment, and the experiences of LGBT persons seeking care, providing a base from which to redress existing health inequities" (p. 2). The American Association of Medical Colleges (AAMC, 2014); the American Medical Association (2019); the American Psychiatric Association (APA,

2012a); and the National Academies of Science, Engineering, and Medicine (Institute of Medicine (IOM), 2011) have unanimously called for improved health professional student education and practitioner training to ensure clinical competence in caring for SGM. To help fill this significant need, the AAMC established physician core competencies for SGM medical care (Hollenbach et al., 2014; Bayer et al., 2017). Healthcare standards for intersex patients are also rapidly changing. Despite the delay in updated guidelines from the American Academy of Pediatrics (Houk, Hughes, Ahmed, & Lee, 2006), three former Surgeons General have recently called for a moratorium on unnecessary infant genital surgeries (Elders, Satcher, & Carmona, 2017) and a new guide from Lambda Legal and InterAct (2018) provides guidance to hospitals for intersex-affirming care. Recently, California became the first state to condemn intersex surgeries on children in 2018 (Miller, 2018).

Yet medical and other healthcare professional schools have not kept pace with these changes. Only recently have interventions aimed to address health professional student learning deficits in SGM health and healthcare. There is limited evaluation data on the efficacy of these interventions and no data on implementation factors influencing successful curricular integration of SGM health content in academic settings. This dissertation begins to address this gap by examining implementation factors for advancing SGM health professional student curricula in academic settings and applying those findings to tailor recommendations for curricular improvement at one academic institution.

Statement of the Problem

Unique Health Needs of SGM

SGM have unique healthcare needs that healthcare professionals are not usually trained to address. SGM have statistically higher tobacco, alcohol, and substance abuse rates compared to heterosexual and cisgender peers, increasing SGM risks for cancer and chronic disease (Cochran, Bandiera, & Mays, 2013; Coulter, Bersamin, Russell, & Mair, 2018; Gonzales, Przedworksi, & Henning-Smith, 2016). SGMs also experience access to care barriers, including health care avoidance, discrimination, and denial of care (National Women's Law Center, 2014; Obedin-Maliver, et al., 2011). In 2018, thirty-seven discrimination complaints to the U.S. Health and Human Services (HHS) were received from transgender patients who were denied routine health care (Diamond, 2018).

SGM are more likely to experience chronic stress from social stigma and family rejection, sleep disorders, unhealthy relationships, sexually transmitted infections, and human immunodeficiency virus (HIV) (Obedin-Maliver, et al., 2011). SGM youth are more likely to be homeless and attempt suicide (Carabez, Pellegrini, Mankovitz, Eliason, & Dariotis, 2015). Lesbian and gay individuals were openly pathologized until 1973, and "reparative therapies" continue to be legal in some states (Hollenbach et al., 2014, p. xvii; Berger, 1994). Transgender individuals were still classified by the American Psychiatric Association as having gender identity disorder until 2012 (APA, 2012b).

Maladaptive coping strategies may develop, in part, from chronic stress due to legal discrimination and invisibility. It is still legal in some states to deny same-sex

marriage, deny services to same-sex couples, deny adoption to same-sex couples, and deny healthcare to people based on moral or religious beliefs (Movement Advancement Project (MAP), 2019). Overall, 21 states currently have religious exemption laws that allow individuals, organizations, and businesses to refuse services to SGM people (MAP, 2019). Very recently, the Health and Human Services (U.S. Department of Health and Human Services, 2019) issued a final rule to strengthen health care providers' ability to refuse services to any patient that violate their "conscience," putting SGM at greater risk for denial of health care (HHS, 2019). SGM experience "institutionalized prejudice, social stress, social exclusion… and anti-homosexual hatred and violence, and internalize shame about their sexuality" (The World Health Organization, 2013, p. 2). In addition, SGM remain largely invisible in national and state-level health data. The proposed 2020 Census plans to capture same-sex households, but single sexual minorities and all transgender and intersex people will remain uncounted (U.S. Census Bureau, 2018).

There is very little research to drive evidence-based clinical care for transgender and intersex people. A recent systematic review of the influence of testosterone therapy on body mass index (BMI), blood pressure, and laboratory tests found only 13 relevant studies and concluded that lack of randomized controlled trials and small sample sizes resulted in low quality of evidence (Velho, Fighera, Ziegelmann, & Spritzer, 2017). Even when evidence is clear, there are medical management challenges that can present with transgender patients. For example, while transgender women are known to have HIV prevalence of 19.1% worldwide, and while The World Health Organization (WHO) recommends antiretroviral therapy (ART) for all individuals HIV+, a recent review of

estrogen-ART drug-drug interaction studies found none that included transgender women or the dose of estrogen therapy recommended for genderqueer people on estrogen therapy as a cross-sex hormone (Radix, Sevelius, & Deutsch, 2016). However, in Braun et al.'s (2017a) study, 40% of transgender women reported not taking estrogen, anti-retroviral therapy (ART), or both as directed due to concerns about drug-drug interactions.

Finally, intersex people have long been hidden from the truth about their bodies, and unnecessary genital surgeries are still common (Dreger, 2015; Dalke, 2017). These surgeries often result in numerous complex and painful follow up surgeries over the lifecourse (InterAct, 2000; Viloria, 2017). In addition, some intersex individuals may have disproportionate cardiovascular disease, gastrointestinal disorders, osteoporosis, autoimmune disorders, visual and hearing challenges, and neurological concerns (Falhammar et al., 2018).

State of Health Professional Student Training

Healthcare professionals are in critical need of education and training to prepare them to care for SGM patients. However, most schools of medicine fall short on SGM content with a median time of only five hours (Obedin-Maliver, et al., 2011). Medical training on transgender and intersex care is particularly sparse, resulting in inadequate physician knowledge and, too often, denial of or inappropriate care (Dowshen et al., 2013; Burke et al., 2015).

Based on the limited references in the literature, non-medical healthcare professionals seem to be lagging even further behind than medical schools. At the University of California, San Francisco, the medical school provided four contact hours

on SGM health while nursing, dentistry, pharmacy, and physical therapy programs reported zero SGM contact hours (Braun et al., 2017c). Lim, Johnson, and Eliason (2015) sampled nursing school administrators to assess school curricula and found a median of 2.12 hours (n=605) of SGM content for nursing programs. In a similar survey of 113 nursing programs, Walsh and Hendrickson's (2015) review of Texas nursing programs reported an average of only 1.6 hours of SGM content (n=21). Lim et al.'s (2015) study of nursing faculty revealed that one-third of the sample had self-reported low awareness of SGM health needs and most did not teach any SGM-related content. Nursing curriculum experts uniformly report SGM content deficiencies (Brennan, Barnsteiner, Siantz, Cotter, & Everett, 2012; Chinn, 2013; Eliason, Dibble, & DeJoseph, 2010; Röndahl, 2009). Similar deficiencies in dental training have been reported by Anderson, Patterson, Temple, and Inglehart (2009), with only 13.3% of student leaders (n=113) from 30 dental schools in the U.S. and Canada indicating preparation to treat SGM patients.

Student satisfaction with SGM content in their curricula also shows a need for improvement. A recent study of 176 medical schools in the U.S. and Canada (n=9,522) found that 66.3% of students rated existing SGM curricula content as "fair" or worse (White et al., 2015). This problem is compounded when considering reports that 45.8% of first-year medical students expressed explicit bias and 81.5% expressed implicit bias against sexual minorities in Burke et al.'s (2015) large, national study. At the most basic level, medical students, practicing clinicians, and researchers are not trained to take

SGM-affirming patient histories and have little practice managing clinical considerations of diverse SGM patients, perpetuating culturally non-responsive healthcare.

Assessment of the George Washington University Medical Curriculum

The George Washington University (GW) School of Medicine and Health Sciences (SMHS) is no exception. In 2017, Abon and Pratt-Chapman (2018a and 2018b) conducted an audit of the pre-clinical curriculum, following a protocol developed by DeVita, Bishop, and Plankey (2018). AAMC-recommended competencies for SGM health and Vanderbilt-identified priority topical areas were used as benchmarks to compare the existing GW SMHS preclinical curriculum (Abon & Pratt-Chapman, 2018a and 2018b; Hollenbach, et al., 2014; DeVita et al., 2018; Pratt-Chapman & Abon, 2019). Pre-clinical curriculum learning objectives were pulled from the curricular database using the search terms: LGB, GLB, LGBT, gay, lesbian, MSM, WSW, bisexual, trans, MTF, FTM, homosexual, intersex, sex development, DSD, sexual orientation, and gender dysphoria. All learning objectives that contained a keyword were mapped into an Excel matrix next to the relevant AAMC competency statement. The matrix was an efficient way to identify which competencies were addressed and how—versus which competencies were not addressed. Following this systematic search, results were shared with the curriculum committee. One curricular leader provided additional feedback to supplement results where a search of learning objectives would not have identified curricular coverage.

The analysis found that 10 competencies were met, 11 competencies were partially met, and 9 competences were not at all addressed in the preclinical curriculum

(Pratt-Chapman & Abon, 2019). A positive finding was that the GW SMHS preclinical curriculum provided slightly more content (7.5 mandatory academic hours) than the 5-hour median reported by Obedin-Maliver et al. (2011). Overall, major gaps were found in professionalism, systems-based practice, interprofessional collaboration, and personal and professional development domains. Specific gaps included consensus-based practices for transgender and intersex patients and championing system changes for SGM-affirming care (Pratt-Chapman & Abon, 2019).

Listed below (quoted verbatim from Hollenbach et al., 2014) are the 9 AAMC competencies that the GW pre-clinical curriculum failed to address at all:

1. Identifying important clinical questions as they emerge in the context of caring for [SGM], and using technology to find evidence from scientific studies in the literature and/or existing clinical guidelines to inform clinical decision making and improve health outcomes;
2. Recognizing and respecting the sensitivity of certain clinical information pertaining to the care of [SGM], and involving the patient (or the guardian of a pediatric patient) in the decision of when and how to communicate such information to others;
3. Recognizing and sensitively addressing all patients' and families' healing traditions and beliefs, including health-related beliefs, and understanding how these might shape reactions to diverse forms of sexuality, sexual behavior, sexual orientation, gender identity, gender expression, and sex development;

4. Accepting shared responsibility for eliminating disparities, overt bias (e.g., discrimination), and developing policies and procedures that respect all patients' rights to self-determination;
5. Understanding and addressing the special challenges faced by health professionals who identify [as SGM] in order to advance a healthcare environment that promotes the use of policies that minimizes and/or eliminates the use of policies that perpetuate disparities;
6. Explaining and demonstrating how to navigate the special legal and policy issues (e.g., insurance limitations, lack of partner benefits, visitation and nondiscrimination policies, discrimination against children of same-sex parents, school bullying policies) encountered by [SGM];
7. Identifying and appropriately using special resources available to support the health of [SGM] (e.g., targeted smoking cessation programs, substance abuse treatment, and psychological support);
8. Identifying and partnering with community resources that provide support to [SGM] (e.g., treatment centers, care providers, community activists, support groups, legal advocates) to help eliminate bias from healthcare and address community needs;
9. Describing strategies that can be used to enact reform within existing healthcare institutions to improve care to [SGM], such as forming an LGBT support network, revising outdated nondiscrimination and employee benefits policies,

developing dedicated care teams to work with patients who were born with DSD, etc.;

Theoretical Foundations

The student investigator draws from the Fundamental Cause Theory, the Consolidated Framework for Implementation Research, and the Knowledge-to-Action Framework. Further, the study aligns with Glassick, Huber, and Maeroff's (1997) research standards.

Fundamental Cause Theory

The Fundamental Cause Theory espouses the philosophy on which the exigence of this work rests. The Fundamental Cause Theory suggests that multiple mechanisms work together and evolve to perpetuate health inequities (Hatzenbuehler, Phelan, & Link, 2015). Stigma is viewed as the fundamental cause. Discrimination and bias are reinforced through intrapersonal, interpersonal, and system-based messages that result in ongoing SGM experiences of stigma (Hatzenbuehler, et al., 2015). Factors such as race/ethnicity, sexual orientation, gender identity, and HIV status are characteristics that are stigmatized, leading to complex and interlocking social and health disparities that persist over time and space. The Fundamental Cause Theory draws from minority stress theory and identity threat models (Meyer, 2003; Major & O'Brien, 2005). The measures selected for the quantitative component of the study include measures of self-reported knowledge, attitudes, clinical preparedness, beliefs, and behaviors. The student investigator assumes that these constructs are influenced by respondent exposures—such as ongoing models of

societal stigma, exposure to SGM patients, and degree of exposure to SGM health curricula.

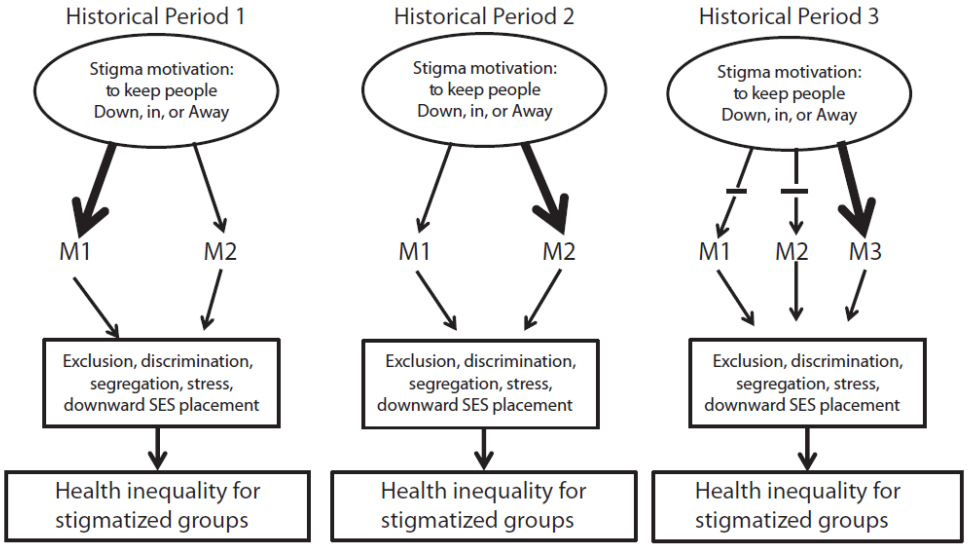

Figure 1. Fundamental Cause Theory

Consolidated Framework for Implementation Research (CFIR)

The CFIR is a framework on which the qualitative component of this study rests. The CFIR was created to distinguish core ingredients of an intervention from adaptable characteristics (Damschroder et al., 2009). The CFIR has five major domains: The intervention, inner and outer setting, individuals involved, and the process of implementation (Damschroder et al., 2009). These overarching domains contain numerous constructs, such as quality of evidence and relative advantage for the intervention domain and organizational culture for the inner setting domain (Damschroder et al., 2009).

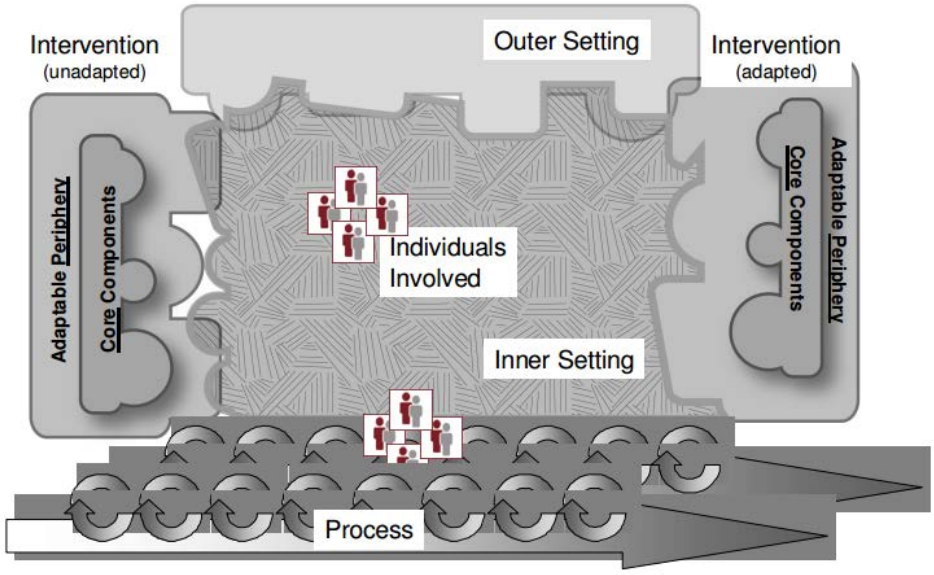

Figure 2. Consolidated Framework for Implementation Research Major Domains (Damschroder et al., Additional file 1: CFIR Figure and Explanatory Text 2009)

By probing for implementation factors that may have impeded or facilitated implementation of SGM curricular interventions across the U.S., this study is poised to provide important data on how to approach SGM curricular enhancements and integration in diverse settings.

Knowledge-to-Action Framework

This project aims to adapt knowledge to local context, a key step in Graham et al.'s (2006) Knowledge-to-Action Process. Adapting evidence to local context can bolster buy-in and sustainability of innovations. Glassick et al. (1997) research standards are a useful complement to the Knowledge-to-Action Process by providing guidance on *how* to adapt knowledge to context. The standards aim to ensure appropriate methods are used, results are significant, findings are effectively presented, and ongoing reflection yields

continuous quality improvement (see Figure 4). The present study focuses on steps 8-10 of Glassick et al.'s (1997) research standards; however, the majority of steps are iterative rather than stepwise.

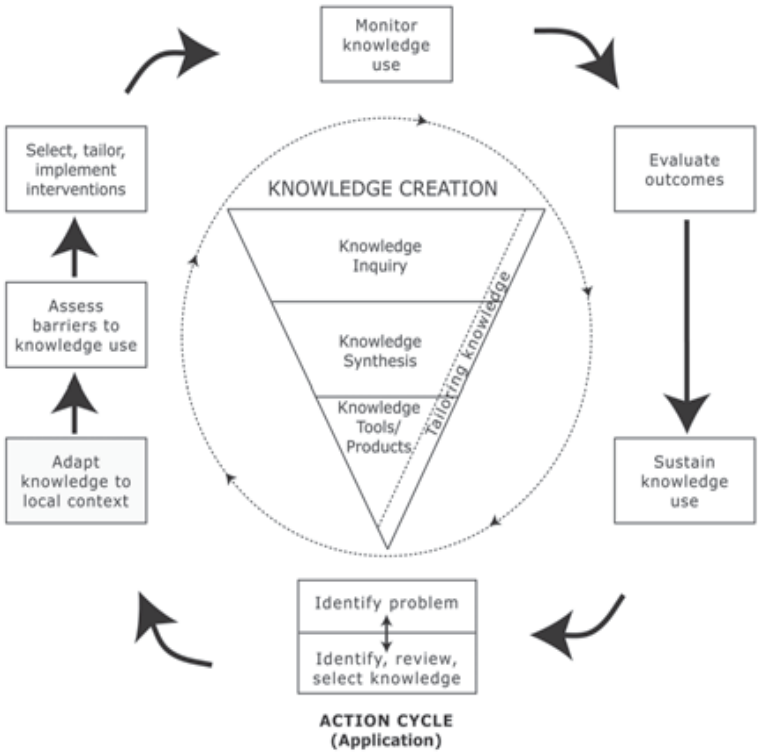

Figure 3. Knowledge-to-Action Process (Sudsawad, 2007)

Engagement of stakeholders is an ongoing process. Steps 1-2 (1: Assemble key advocates to establish program vision and 2: Demonstrate need) were partially addressed through a prior assessment conducted by the student investigator and a medical student (Pratt-Chapman & Abon, 2019). This assessment defined the problem for at least one health professional school at GW: Abon and Pratt-Chapman's (2018a) needs assessment was presented to the GW SMHS pre-curriculum committee and the director of the clinical curriculum in 2017, which garnered key supporters (Step 3: Identify and engage

experts). The results of the present study provide additional needs assessment data (Step 2).

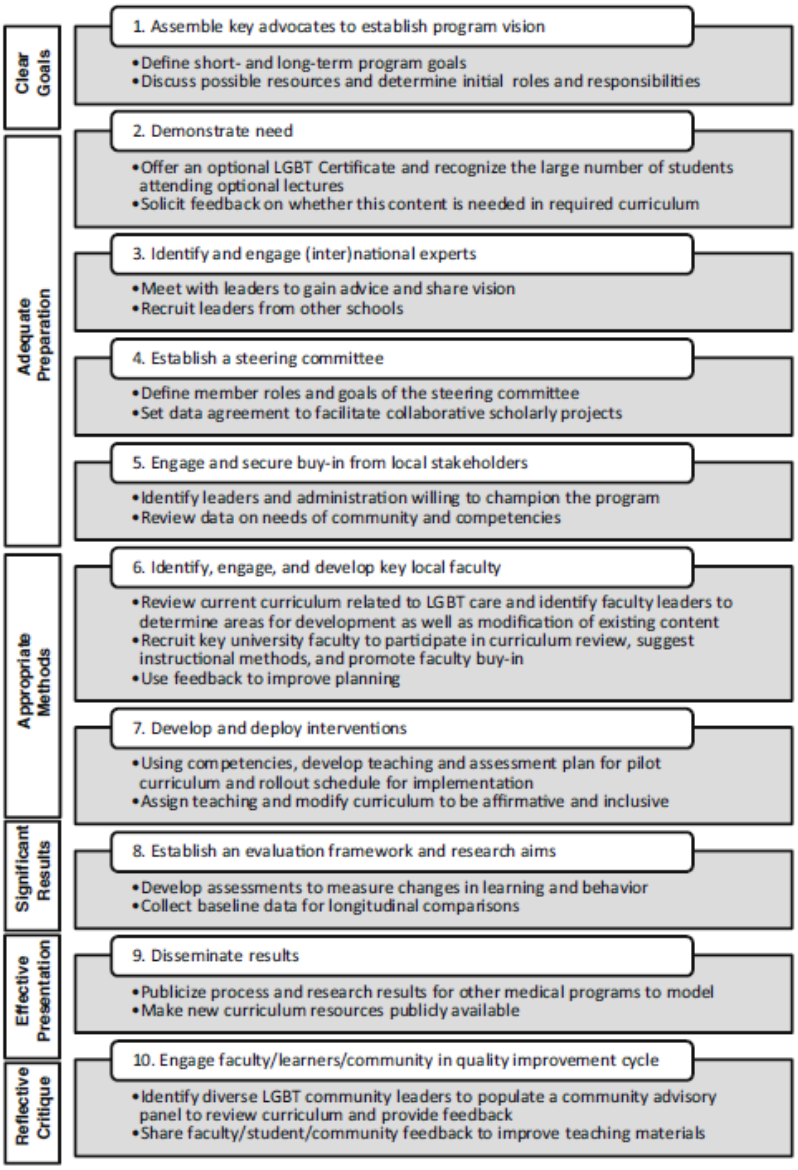

Figure 4. Glassick, Huber, and Maeroff's (1997) research standards

Establishment of an SGM Community Advisory Board in 2016 and an SGM Education Steering Committee in 2018 expanded expert engagement in the organizational

change process (Step 4: Establish a steering committee). The steering committee, initially established to guide the first symposium on SGM health for health professional students at GW on November 17, 2018 (Pratt-Chapman & Phillips, 2019), can be tapped for other curricular integration efforts as opportunities arise. Step 3 remains iterative as the student investigator identifies and engages additional experts; however, the process of conducting this study coupled with ongoing on-campus outreach has yielded significant progress in identifying and engaging experts in this culture and curriculum change initiative. Step 5 (Engage and secure buy-in from local stakeholders) was partially accomplished through a 2018 community forum, where improved competence of future healthcare providers was prioritized as the second most pressing concern related to SGM health for the SGM community in Washington, DC (GW Cancer Center, 2018). Closer to campus, ongoing conversations with medical student curricular leadership and increased collaboration with the GW SMHS Office of Diversity and Inclusion has increased awareness and buy-in within the medical school. Recently, the student investigator collaborated with a colleague and two Associate Deans for SMHS on a proposal to the American Medical Association for funds to enhance SGM curricula based on findings of this project. However, this project was not funded.

Step 6 (Identify, develop, and engage key local faculty) was partially accomplished through a symposium on SGM health hosted on November 17, 2018 (Pratt-Chapman & Phillips, 2019). Attending faculty were provided an overview of existing curricula and encouraged to access evidence-based guidelines and standards from the World Professional Association for Transgender Health (2018), the Endocrine Society

(n.d.), the University of California San Francisco Center of Excellence for Transgender Health (2018), and the Intersex Society of North America (2006), as well as educational resources from Fenway Institute (2018), the Med Ed Portal (AAMC, n.d.), and the GW TEAM Training (n.d.). While participation of faculty was limited, statistically significant improvements were shown for across all learning outcomes for students who attended (Pratt-Chapman & Phillips, 2019). Efforts to engage curricular theme leaders and clerkship directors is ongoing.

The proposed project focused on leveraging insights of SGM curricular champions in other academic settings to inform recommendations to address deficits in graduate health professional student knowledge, attitudes, clinical preparedness, beliefs, and behaviors at GW. These data were meant to inform future development and implementation of SGM curricular integration (Step 7). The present study established an evaluation framework and research aims (Step 8) to guide recommendations for curricular improvement that can be used by other institutions (Step 9). Faculty, learners and community members will need to be engaged on an ongoing basis in SGM curricular integration and ongoing quality improvement (Step 10) to optimize successful improvements in learning at GW.

Research Design

Purpose of Study

The present study aimed to provide strategic recommendations for curricular change at GW health professional schools, particularly in the School of Medicine and Health Sciences (SMHS), in an effort to enhance student preparedness in caring for SGM

people. Specifically, the study supplemented the curriculum audit of GW SMHS conducted in 2017 by conducting a secondary data analysis of student-rated preparedness in caring for SGM based on exploratory models of eight potentially explanatory variables. Based on quantified gaps identified in the secondary data analysis, lessons learned from leaders who have implemented SGM health curricular change informed tailored recommendations for GW.

Research Paradigm

The research paradigm adopted for the study is pragmatism, a common paradigm for mixed methods studies (Creswell & Plano Clark, 2011). Pragmatism values the practical consequences of research and practical approaches necessary to reach intended outcomes (Lincoln, Lynham & Guba, 2011). Cameron (2011) acknowledges pragmatism as a typical paradigm for mixed methods researchers, but also recognizes it as an essential method for mixed methods research. Cameron (2011) defines pragmatism as "a practical approach to a problem" that integrates paradigm and methodology to achieve practical aims (p. 101). From both a paradigmatic and methodological standpoint, the researcher values practical application of feasible strategies to improve the delivery of healthcare services to SGM and thus strongly aligns with pragmatism. The researcher also values constructivism and assumes that the interaction that occurs between patients and healthcare professionals is constructed with both parties influencing the interaction and its resultant actions and outcomes.

Research Lens

The methodology of the present study is informed by the investigator's commitment to equitable health care for all (axiology). The ontological assumption of the investigator is constructivist. Specifically in this context, interpersonal interactions such as patient-provider interactions are framed through the lens of the participants—both providers and patients—which can vary substantially based on lived experiences including: Family upbringing, education, political affiliation, religious beliefs, and medical training of individuals. These perspectives can moderate knowledge, attitudes, confidence, skills, and behaviors relative to SGM–affirming healthcare.

The investigator's epistemology values both quantitative and qualitative data when considering context and complexity around organizational change. The researcher aims to provide a snapshot of current student preparedness. Admittedly, self-reported data is an inexact representation of student readiness; however, the investigator's pragmatic approach and resource limitations prevent a more objective assessment based on observed student behaviors. Qualitative insights from investigators who have championed change at diverse institutions across the U.S. can inform organizational context barriers and facilitators to help champions in other settings be more successful. A mixed methods approach was chosen to align gaps identified in research question one (RQ1) with insights gained from research question two (RQ2) to provide tailored recommendations that address research question three (RQ3).

Research Questions

Research questions for this study include the following: RQ1) What Reduced Models explain a meaningful amount (≥0.15) of total variance among health professional student self-reported knowledge, attitudes, clinical preparedness, beliefs, and behaviors regarding SGM patient health and health care?; RQ2) What lessons have champions at other institutions learned about implementing SGM curricular change?; RQ3) How can implementation lessons from other institutions be used to improve GW health professional student preparedness in caring for SGM?

Hypotheses

Hypotheses for RQ1: In a sample of health professional students at an urban academic center, at least one Reduced Model comprised of fewer than eight predictor variables will explain a meaningful amount of total variance for each outcome variable ($R^2 \geq .15$), using multiple linear regression. RQ2 and RQ3 are naturalistic, and thus not hypothesis-driven.

Summary of Methodology

This mixed methods, concurrent design study explored student-reported preparedness in caring for SGM patients using three validated scales (see Appendix A). Implementation moderators of successful curricular interventions were explored through semi-structured interviews with investigators who have championed curricular change in health professional academic settings within the last five years and/or SGM curricular experts referred by these investigators. Lessons from the qualitative strand were used to

recommend strategies to address gaps identified in the quantitative strand specific to SGM health curricula at GW.

Quantitative Study

A secondary data analysis was conducted on an existing data set originally designed to measure differences in knowledge, attitudes, and clinical preparedness between health professional students who attended a one-day SGM-focused health symposium at GW compared to students who did not attend (Pratt-Chapman & Phillips, 2019). The data set included sociodemographic questions regarding past exposure to SGM patients and health education; the Lesbian, Gay, Bisexual, and Transgender Development of Clinical Skills Scale (LGBT-DOCSS; Bidell, 2017); the Attitudes Toward LGBT Patients Scale (ATLPS; Wilson et al., 2014; Sanchez, Rabatin, Sanchez, Hubbard, & Kalef, 2006); and the Gay Affirming Practice Scale (GAPS; Crisp, 2006). The secondary data analysis consisted of three parts: 1) Descriptive means and standard deviation scores for the sample; 2) Multiple linear regression to explore key variables that explained greater than 2% variance for each criterion variable; and 3) Multiple linear regression to create Reduced Models that explained a meaningful amount of total variance on the criterion variables. Eight independent variables were used to examine each criterion variable initially: sexual orientation (categorical), sex (categorical), political affiliation (categorical), religiosity (categorical), spirituality (categorical), exposure to SGM in personal life (categorical), number of hours of SGM-specific training hours (continuous), and number of SGM-identified patients with whom the respondent has interacted in the prior six months (continuous). Dummy coding was used

to dichotomize categorical variables. Data were accessed through the secure RedCap database for data collected from the primary study control group. The intervention group for the primary study was excluded from the analysis due to variation in question wording for the GAPS-behavior subscale from pre-test to post-test, and due to the heightened likelihood of social desirability bias following the learning intervention in that group.

Qualitative Study

The student investigator contacted investigators (N=21) who championed SGM learning interventions in other academic health settings to invite them to interview. Investigators were eligible to participate if they had published an SGM-focused learning intervention in the last five years (see Appendix C) or were referred by someone who had published an SGM-focused learning intervention in the last five years. Interviews consisted of approximately 60 minute WebEx video or audio sessions, probing for information relevant to the five overarching CFIR domains (i.e., intervention characteristics, outer setting, inner setting, individuals involved, process of implementation) (Damschroder et al., 2009). No incentives were provided to those who participated in the interviews. Recordings of WebEx recordings were stored in a Box folder on secure GW servers. Qualitative data were transcribed by uploading to Rev.com (San Francisco, CA), a secure platform that stores and transmits files using TLS 1.2 encryption and a 128-bit AES key (Myers, 2017). Transcripts were de-identified and stored in a separate Box folder available to the student investigator and the Chair of her committee. The student investigator conducted open and axial coding to identify themes

that were formalized into a codebook (Appendix F). The Chair reviewed methods for consistency at multiple points. All interviewees were provided with qualitative results for member checking to ensure trustworthiness. An external subject matter expert reviewed findings for transferability.

Mixing of Data

Qualitative findings provided critical data to inform tailored recommendations to address gaps in student preparedness to care for SGM patients identified in the quantitative study. Findings were presented in a joint display of data with qualitative themes adjacent to quantitative findings in Chapter 5.

Limitations and Delimitations

Limitations

The major limitation of this study is the scope of the primary data set—specifically the size of the sample and the fact that the sample is derived from only one academic institution (Pratt-Chapman & Phillips, 2019). The primary study from which this secondary analysis is proposed consisted of a convenience sample; thus, the secondary sample is also a convenience sample. Findings cannot be assumed to be generalizable to the full GW health professional student population nor to students beyond GW. The quantitative study is also cross-sectional; therefore, results are only a snapshot in time and may not represent evolving knowledge, attitudes, clinical preparedness, beliefs, and behaviors of students. Respondents are subject to social desirability bias. Social desirability bias was minimized by only using data from the comparison group from the primary study.

A significant limitation was identified just prior to conducting the secondary analysis: The face validity of two items on the ATLPS (Wilson et al., 2014) were determined to be highly questionable, comprising the interpretation of results from that scale. See Chapter 5 for a discussion of this limitation.

The qualitative sample was a purposive sample of investigators and referred colleagues at other academic institutions. Qualitative findings are inherently subjective. Characteristics of the interviewee may produce social desirability bias through understatement or overstatement of institutional facilitators or barriers, depending on the individual experiences, career stage, and disposition of each participant. Examination of both facilitators and barriers and assurance of anonymity was intended to minimize these inherent risks.

Delimitations

The quantitative sample was limited to health professional students at GW who were invited to participate in an online survey assessing knowledge, attitudes, preparedness, beliefs, and behaviors in the fall of 2018 (Pratt-Chapman & Phillips, 2019). The qualitative sample was limited to investigators who had published interventions either in the peer-reviewed literature or through the AAMC Med Ed Portal in the last five years as of the date of the literature review—or curricular champions referred by investigator colleagues who had published in the last five years. Recommendations were limited to tailoring curricular change at one academic institution in the U.S., though other institutions may find these recommendations helpful.

Statement of Potential Impact

Currently, most health care professional students are ill equipped to meet the needs of SGM patients. This study specifically informs future curriculum integration of SGM content at GW health professional schools. GW sits in the nation's capital where nearly 11% of the population identifies as SGM (Williams Institute, 2016). Lessons learned from the qualitative study can be used to guide GW and other institutions in implementing curricular change to advance health professional student preparedness in caring for SGM. The study protocol can be replicated in other settings to identify baseline deficiencies in student self-reported competence (defined as knowledge, attitudes, clinical preparedness, beliefs, and behaviors, collectively) and to create tailored recommendations leveraging insights from implementation lessons learned.

Translational Nature of the Study

As noted by the Agency for Health Research and Quality (2001), the translation of research to practice is "slow and haphazard" (Graham, et al., 2006, p. 13). Implementation of curricular change to improve health services and care for SGM are relatively new. To date, no study has explored organizational factors that might facilitate or impede implementation of SGM health curricular change in an academic setting or moderate learning outcomes for students. This study explored experiences of faculty across the U.S. and in one international setting who championed SGM curricular change. The qualitative data informed tailored recommendations for curricular change at GW. It is hoped that researchers at other institutions will be able to replicate the protocol to transform curricula in their respective academic settings.

Sustainability

The long-term goal of this project is to integrate SGM health content across GW health professional core curricula to improve the competence of graduate health professional students. The inclusion of student self-report data and faculty insights from competing schools is hoped to foster healthy competition to advance long-term integration of SGM content in GW health school curricula.

Definitions of Key Terms

Affirming interactions: "person-to-person encounters that leave individuals feeling acknowledged and respected regarding their self-identities" (Hollenbach et al., 2014, p. 220).

Asexual: "usually refers to a person who feels no sexual desires" (Hollenbach et al., 2014, p. 220).

Bisexual: "usually refers to a person who has a sexual attraction to both males and females" (Hollenbach et al., 2014, p. 220).

Cisgender: "usually refers to a person whose gender identity aligns with the [sex]* label given at birth (i.e., the term refers to people who are not transgender)" (Hollenbach et al., 2014, p. 220). Note that this term is not universally embraced as it assumes binary sex-gender (Viloria, 2017).

Coming out: the process of disclosing one's sexual orientation and gender identity to others

Cross-dresser: a person who wears items or clothing typically associated with the opposite sex

Competencies: "measurable or observable behaviors that combine knowledge, skills, and attitudes related to specific professional activities" (Hollenbach et al., 2014, p. 220).

Competency-based education: "an educational system … [with a] focus on helping students achieve milestones or benchmarks that move them toward being competent to practice. Within medical education, the acronym CBME (competency-based medical education) is in widespread use as this educational model supplants the older model of academic medical education" (Hollenbach et al., 2014, p. 220).

Competency domain: "a grouping of competencies organized around a theme" (Hollenbach et al., 2014, p. 220).

Consolidated Framework for Implementation Research (CFIR): consolidates multiple implementation science models through five major domains—characteristics of individuals involved, intervention characteristics, inner and outer setting, and process of implementation—with each domain containing numerous granular constructs that inform implementation of an intervention (Damschroder et al., 2009).

Individual characteristics: A CFIR domain associated with individual identification with organization, individual stage of change, knowledge and beliefs about intervention, other personal attributes, and self-efficacy (CFIR Research Team-Center for Clinical Management Research (CFIR), 2019).

Intervention characteristics: Key attributes of interventions that influence the success of implementation that include adaptability, complexity, cost, design quality and packaging, evidence strength and quality, intervention source, relative advantage, and trialability (CFIR, 2019).

Inner setting: A CFIR domain associated with structural characteristics, networks, and communications, culture, implementation climate, and readiness for implementation (CFIR, 2019).

Outer setting: High level domain in the CFIR that includes cosmopolitanism, external policies and incentives, patient needs and resources, and peer pressure (CFIR, 2019).

Process of implementation: A CFIR domain that is associated with engaging, executing, planning, reflecting and evaluating (CFIR, 2019).

Constructs: ideas measured in a study; for purposes of this study these include:

1) ***Knowledge*****:** measured using the knowledge factor of the Lesbian, Gay, Bisexual, and Transgender Development of Clinical Skills Scale (LGBT-DOCSS; Bidell, 2017)

2) ***Attitudes:*** measured using Attitudes factor of the Lesbian, Gay, Bisexual, and Transgender Development of Clinical Skills Scale (LGBT-DOCSS; Bidell, 2017); secondarily, the ATLPS also measures attitudes in this study (Wilson et al., 2014).

3) ***Clinical preparedness*****:** measured using the clinical preparedness factor of the Lesbian, Gay, Bisexual, and Transgender Development of Clinical Skills Scale (LGBT-DOCSS; Bidell, 2017)

4) ***Beliefs***: measured using the beliefs factor of the Gay Affirming Practice Scale (GAPS; Crisp, 2006); and

5) ***Behaviors***: measured using the behaviors factor of the Gay Affirming Practice Scale (GAPS; Crisp, 2006); and

Differences of Sex Development (DSD): "an emerging umbrella term to replace "disorders of sex development" (Hollenbach et al., 2014, p. 220). Note that this term is not universally embraced as a medicalized term for intersex (Viloria, 2017).

Disorders of Sex Development (DSD): "umbrella term for a wide variety of congenital conditions in which the development of chromosomal, gonadal, and/or anatomical sex is atypical" (Hollenbach et al., 2014, p. 220); replaced the terms "intersex" and "hermaphrodite" in 2006 and is highly controversial as a pathologizing term for intersex conditions (see "differences of sex development").

Drag king: a biological female who dresses and presents in hypermasculine attire part-time (IOM, 2011).

Drag queen: a biological male who dresses and presents in hyperfeminine attire part-time (IOM, 2011).

Explicit attitudes: consciously controlled self-reported attitudes (Burke et al., 2015)

Female-to-Male (FtM): "usually refers to a transgender person who was identified as female at birth but who identifies as a male in terms of his gender identity" (Hollenbach et al., 2014, p. 221).

Fundamental Cause Theory: suggests that multiple mechanisms work together and evolve to perpetuate stigma resulting in entrenched health inequities (Hatzenbuehler et al., 2015)

Gay: "usually refers to a person who identifies his or her primary romantic feelings, sexual attractions, and/or arousal patterns as being toward someone of the same gender or sex" (Hollenbach et al., 2014, p. 221).

Gender: socially constructed "psychological, behavioral, and cultural characteristics that are believed to be associated with maleness and femaleness" (Hollenbach et al., 2014, p. 221).

Gender-affirming: "an adjective used to refer to behaviors or interventions that affirm a transgender person's gender identity" (Hollenbach et al., 2014, p. 221).

Gender discordance: "a mismatch between natal sex and felt gender identity" (Hollenbach et al., 2014, p. 221).

Gender dysphoria: "significant subjective internal distress arising from a mismatch between natal sex and one's personal sense of gender identity that leads an individual to desire some form of gender transition through social, hormonal, and/or surgical means" (Hollenbach et al., 2014, p. 221).

Gender expression: "mannerisms, personal traits, clothing choices, etc., that serve to communicate a person's identity as they relate to a particular societal gender role" (Hollenbach et al., 2014, p. 221).

Gender identity: "an individual's personal and subjective inner sense of self as belonging to a particular gender (e.g., being a boy/man, girl/woman, genderqueer, transmasculine spectrum, transfeminine spectrum)" (Hollenbach et al., 2014, p. 221).

Gender nonconforming: "a person who does not conform to prevailing gendered behaviors or roles within a specific society. People who are gender nonconforming may

not take part in activities conventionally thought to be associated with their assigned [sex][*]" (Hollenbach et al., 2014, p. 221).

Gender role: "the role a person plays or is expected to play socially in terms of gender within a specific society, conventionally referred to along a masculine-feminine spectrum" (Hollenbach et al., 2014, p. 222).

Genderqueer: "umbrella category for people whose gender identities are something other than male or female" (Hollenbach et al., 2014, p. 222).

Heterosexism: "a system of attitudes, bias, and discrimination favoring opposite-sex sexuality and relationships and stigmatizing same-sex sexuality and relationships (Hollenbach et al., 2014, p. 222); frames heterosexuality as "normal" or superior" (Hollenbach et al., 2014, p. 222).

Heterosexual: "usually used as an adjective to refer to relations between a man and a woman" (Hollenbach et al., 2014, p. 222).

Homophobia: "a range of aversive reactions to homosexuality, homosexual behavior, and people with same-gender attraction or behavior" (Hollenbach et al., 2014, p. 222).

Homosexual: "usually used as an adjective to refer to same-gendered relations" (Hollenbach et al., 2014, p. 222).

Iatrogenic: "usually used to refer to harms caused by medical practice" (Hollenbach et al., 2014, p. 222).

[*] NOTE: The author changed the word "gender" to "sex" in this definition.

Implicit attitudes: "automatic responses that often occur outside conscious awareness" (Burke et al., 2015, p. 645).

Intersectionality: examination of sexual orientation and gender identity within the context of race, ethnicity, socioeconomic experience, geography and other identity factors (IOM, 2011).

Intersex: "historically, a term used in biology and, later, in medicine to refer to beings (including people) whose sex development falls between the male-typical and female-typical forms" (Hollenbach et al., 2014, p. 222).

Lesbian: "usually refers to a female person who identifies her primary romantic feelings, sexual attractions, and/or arousal patterns as being toward a person of the same gender or sex" (Hollenbach et al., 2014, p. 222).

Life-course perspective: cohort differences over time due to generation experiences and age (IOM, 2011).

Male-to-Female (MtF): "usually refers to a transgender person who was identified as male at birth but who identifies as a female in terms of her gender identity" (Hollenbach et al., 2014, p. 222).

Microaggression: "subtle, ongoing discrimination in the form of verbal, behavioral, and environmental slights and indignities" (Hollenbach et al., 2014, p. 222).

Minority stress perspective: experiences and impact of stigma shared by racial, ethnic, sexual, gender and other minorities (IOM, 2011).

Natal Sex: "usually refers to the sex karyotype (XX, XY, XO, XXY, etc.) and sex phenotype (external genitals, gonads, internal sex organs) with which a person was born" (Hollenbach et al., 2014, p. 223).

Pubertal suppression: "a medical practice using GnRH analogs to reversibly suppress puberty in younger adolescents who are gender dysphoric to allow for further exploration of gender identity issues while minimizing the potential for worsening psychiatric symptomatology before considering more irreversible interventions that may include cross-sex hormones and/or gender-affirming surgeries" (Hollenbach et al., 2014, p. 223).

Reparative therapy: "a now-discredited treatment approach in which the desired outcome was to make a person heterosexual" (Hollenbach et al., 2014, p. 223); also called **conversion therapy.**

Sex: "the aggregate of an individual's biological traits (genotypical and phenotypical) as those traits map to male/female differentiation and the male-female anatomical and physiological spectrum (see also "natal sex")" (Hollenbach et al., 2014, p. 223).

Sexual behavior: "the sexual acts in which humans engage" (Hollenbach et al., 2014, p. 223).

Sex-change: "historically used to refer to when a transgender person undertook what are now called gender-affirming procedures" (Hollenbach et al., 2014, p. 223).

Sexual dysfunction: "the experience, by an individual or a couple, of difficulty with sexuality" (Hollenbach et al., 2014, p. 223).

Sexual identity: "how people think of themselves or others in terms of romantic and sexual attractions" (Hollenbach et al., 2014, p. 223).

Sexual orientation: A complex construct comprised of at least three dimensions: sexual identity, attraction and enduring behavior (Federal Interagency Working Group on Improving Measurement of Sexual Orientation and Gender Identity in Federal Surveys, 2016)

Social ecological perspective: The idea that individual health is affected by interpersonal and community influences (IOM, 2011).

Standardized patients: "actors who are trained to simulate real patients in order for students to learn and practice clinical skills" (Hollenbach et al., 2014, p. 223).

Straight: "usually refers to a person who identifies her or his primary romantic feelings, sexual attractions, and/or arousal patterns as being toward a person of the opposite gender or sex" (Hollenbach et al., 2014, p. 223).

Transgender: "individuals who have gender identities that do not align with the gender [or sex] labels they were assigned at birth" (Hollenbach et al., 2014, p. 224).

Transitioning: "process undertaken by a transgender individual of adopting a social gender identity that is different from the gender assigned to that individual at birth" (Hollenbach et al., 2014, p. 224).

Transphobia: "range of aversive reactions towards gender nonconforming and/or transgender people" (Hollenbach et al., 2014, p. 224).

Transsexual: outdated term that refers to those who wish to use hormones and/or surgery to adopt characteristics associated with their identified gender (IOM, 2011).

Transvestite: person who obtains pleasure by dressing as the opposite sex.

Two-spirit: term used by some Native American communities for people who have both feminine and masculine qualities (IOM, 2011).

Conclusion

The present study addresses a critical need in health professional student education by identifying lessons learned from prior SGM curricular implementation efforts. Findings provide important data to inform GW health professional curricular improvements, particularly at the GW SMHS. The student investigator developed recommendations for GW SGM curricular integration using a pragmatic lens. Findings may be extrapolated to benefit other GW schools (e.g., School of Nursing, Columbian College Department of Psychology, Milken Institute School of Public Health) as well as other health professional schools across the U.S.

CHAPTER 2: LITERATURE REVIEW

Introduction

Healthcare provider clinical and cultural competence influences the type, quality, and experience of healthcare services SGM patients receive. However, healthcare professional student curricula focused on SGM content is minimal: Medical students receive a median of 5 hours, nursing students receive a median time of 2.12 hours, and dental students receive an average of 3.68 hours (Obedin-Maliver et al., 2011; Lim et al., 2015; Hillenburg, Murdoch-Kinch, Kinney, Temple, & Inglehart, 2016). Published studies of healthcare professional learning interventions to improve one or more components of clinical competence and/or to moderate sexual/gender minority bias in academic healthcare settings are relatively rare, with only 48 interventions identified since 1977 in the peer-reviewed literature and a major repository of curricular tools (the Med Ed Portal). The AAMC Med Ed Portal houses 29 SGM-specific curriculum submissions as of the time of this writing. Ten of the 29 items were included in this review. Excluded submissions were not learning interventions, were not focused on patient care, or did not have a research endpoint beyond student satisfaction.

Literature Search Strategy

Keyword Search Strategies

Five searches in the PubMed database were performed from July to October 2018. The first two searches aimed to contextualize healthcare professional attitudes about SGM patients. The second three searches aimed to identify learning interventions for health professional students and practitioners to improve cultural or clinical competence in working with SGM patients. A hand search of reference lists from key articles and

Med Ed Portal SGM-focused interventions, as well as identification of former interventions cited within more current intervention articles, yielded additional articles for review. Search threads are listed below:

- Search 1: (((((("Sexual behavior"[Mesh]) AND "Gender Dysphoria"[Mesh]) OR "Bisexuality"[Mesh]) OR "Homosexuality"[Mesh]) OR "Transsexualism"[Mesh])) AND ((("Stereotyping"[Mesh]) AND "Social Discrimination"[Mesh]) OR "Prejudice"[Mesh])) AND (("Health Personnel/education"[Mesh] OR "Health Personnel/ethics"[Mesh] OR "Health Personnel/psychology"[Mesh] OR "Health Personnel/standards"[Mesh] OR "Health Personnel/trends"[Mesh])) yielded 102 articles.
- Search 2: (("Curriculum"[Mesh] AND "Education"[Mesh])) AND (("Attitude of Health Personnel"[Mesh]) AND (((("Sexual behavior"[Mesh]) AND "Gender Dysphoria"[Mesh]) OR "Bisexuality"[Mesh]) OR "Homosexuality"[Mesh]) OR "Transsexualism"[Mesh])) yielded 20 articles.
- Search 3: Search 3: (((lgbt*[Title/Abstract] OR SGM[Title/Abstract]) AND medical[Title/Abstract]) AND (educat*[Title/Abstract] OR student[Title/Abstract])) yielded 81 articles.
- Search 4: (((((((lesbian[Title/Abstract] OR gay[Title/Abstract] OR bisexual[Title/Abstract] OR transgender[Title/Abstract] OR queer[Title/Abstract] OR intersex[Title/Abstract] OR lgbt*[Title/Abstract] OR sgm[Title/Abstract] OR "sexual[Title/Abstract] AND gender minority"[Title/Abstract])) AND (educat*[Title/Abstract] OR

student[Title/Abstract] OR academic[Title/Abstract])))) AND (medic*[Title/Abstract] OR nurs*[Title/Abstract] OR "healthcare"[Title/Abstract]))) AND (knowledge[Title/Abstract] OR attitude*[Title/Abstract] OR behavior*[Title/Abstract] OR competenc*[Title/Abstract]) limited to last five years yielded 193 articles.

- Search 5: ((((((lgbt*[Title/Abstract] OR SGM[Title/Abstract] OR lesbian[Title/Abstract] OR gay[Title/Abstract] OR bisexual[Title/Abstract] OR transgender[Title/Abstract] OR genderqueer[Title/Abstract] OR queer[Title/Abstract] OR intersex[Title/Abstract] OR "sexual[Title/Abstract] AND gender min*"[Title/Abstract] OR "gender non-conforming"[Title/Abstract] OR "gender nonconforming"[Title/Abstract] OR "same gender loving"[Title/Abstract] OR "SGL"[Title/Abstract] OR "men who have sex with men"[Title/Abstract] OR "MSM"[Title/Abstract] OR "women who have sex with women"[Title/Abstract] OR "WSW"[Title/Abstract] OR "two spirit"[Title/Abstract] OR "pansexual"[Title/Abstract])) AND (educat*[Title/Abstract] OR student[Title/Abstract] OR academic[Title/Abstract] OR medic*[Title/Abstract] OR nurs*[Title/Abstract] OR healthcare[Title/Abstract] OR provider[Title/Abstract] OR practitioner[Title/Abstract])) AND (knowledge[Title/Abstract] OR attitude*[Title/Abstract] OR behavior[Title/Abstract] OR skill*[Title/Abstract] OR competenc*[Title/Abstract] OR

intervention[Title/Abstract] OR learning[Title/Abstract])) AND "last 5 years"[PDat])) AND ((("Curriculum"[Mesh] AND "Education"[Mesh])))

yielded 47 articles

Reference List Review

Fifteen key references and all of the Med Ed Portal interventions were selected for reference list review. Ten of the key references were past learning interventions targeted for medical or nursing students to improve knowledge, attitudes, and/or behaviors relevant to SGM healthcare. Five articles were assessments of medical or nursing student knowledge, attitudes, preparedness, comfort, or mediators of competence (e.g., empathy, etc.) in providing healthcare to SGM. The reference list title review yielded mostly grey literature, adjacent research literature (e.g., racial or socioeconomic bias among medical students or practitioners), background literature on the healthcare needs and health disparities of SGM, theory, and methods articles. As a result of the reference review, new abstracts to review totaled 147.

After removing 62 duplicates, the 5 PubMed searches and key reference list title review yielded 405 abstracts in total to review, from which 100 full text articles were selected as priority for full-text review based on the following criteria: 1) Assessments of health professional competence in caring for SGM; 2) curricular interventions to improve health professional competence in caring for SGM; 3) contextual assessments; 4) and bioethical perspectives.

Additional interventions not published in peer-reviewed journals or published prior to online indexing, past needs assessments, and studies of validated scales were

added to the literature review on a rolling basis as they were identified while reviewing current interventions. A google scholar feed was set up to capture relevant articles indexed after the formal PubMed searches. In total, more than 200 full-text articles were reviewed.

Comprehensiveness of Review

In a recent systematic review of curricular interventions and training focused on SGM health, the authors found 15 studies out of 1,171 papers that met their review criteria, five of which were not included in Table 1 (Sekoni, Gale, Manga-Atangana, Bhaduri, & Jolly, 2017). Of these five studies, two were medical resident interventions, two were practitioner interventions, and one was an intervention published in 2003. Eligibility for inclusion in Sekoni et al.'s (2017) review were: 1) Learner target population was medical, dental, nursing, midwife or pharmacy practitioners or students; 2) A comparator of standard training or no training was included in the research design; and 3) Outcomes were assessed (e.g., knowledge, attitudes, or practice about sexuality related challenges and LGBT health). This summary supports the comprehensiveness of the student researcher's literature review, which aimed to identify well-designed curricular interventions for health professional students not yet in residency with evaluation outcomes published within the past five years.

Description and Critique of the Scholarly Literature

Healthcare Professional Bias

Past research has demonstrated homophobia among doctors (Smith, & Matthews, 2007); nurses (Randall & Eliason, 2012; Blackwell, 2008); midwives (Wilton &

Kaufmann, 2001); dentists (Cohen, Romberg, Grace, & Barnes, 2005); elderly care workers (Ahrendt et al., 2017; Brotman et al., 2007; Claes & Moore, 2000); and healthcare supervisors (Long, 1996). The most pervasive bias is heterosexism (Moscheta, Souza & Santos, 2016). Heyes, Dean and Goldberg (2016) posit that heteronormativity—the foundation of heterosexism—is reinforced by existing power structures. Heterosexism has been described by Long (1996) as having four domains: Discrimination, lack of knowledge, stereotyping, and insensitivity. Homophobia—a more extreme form of bias—has been shown to be associated with fear of sexual differences and the belief of difference as deviance (Wilton & Kaufmann, 2001). In past research, fear of HIV and AIDS have predicted anti-SGM bias (Hayward & Weissfeld, 1993; Scherer et al., 1992; Hazelkorn, 1989). Healthcare professional students (Hazelkorn, 1989; Hayward & Weissfeld, 1993) historically showed reticence in providing care to people with AIDS due to fear. A recent review of primary care provider attitudes revealed that while most providers now at least intend to be SGM-affirming, a minority of providers still harbor negative views of SGM people (Aleshire et al., 2018).

Sociodemographic predictors of bias. Predictor variables of SGM bias in past research have included: Heterosexual orientation (Greene et al., 2018); male sex (Thomas, Scott, & Brooks, 1980; Chng & Moore, 1991; Green, Dixon, and Gold-Neil, 1993; Black, Oles, and Moore, 1996; Morrison & Morrison, 2011; Norton and Herek, 2013; Beagan, Fredericks, & Goldberg, 2012; Banwari, Mistry, Soni, Parikh, & Gandhi, 2015; Fisher et al., 2017; Greene et al., 2018); older age (Bidell, 2013); belief in traditional gender roles (Swank, & Raiz, 2007; Morrison & Morrison, 2011); acceptance

of aggressiveness as a male characteristic (Swank, & Raiz, 2007); non-white race (Chng & Moore, 1991; Black, Oles, & Moore, 1996; Greene et al., 2018); racism (Morrison, & Morrison, 2011); lack of egalitarian humanism (Morrison, & Morrison, 2011); heterosexual status (Bidell, 2013); low number of SGM acquaintances (Herek, 1984; Norton & Herek, 2013; Bidell, 2013; Grosz et al., 2017); no/low number of contact hours of SGM training (Cramer, 1997; Bidell, 2013; Dowshen et al., 2013); conservative or fundamentalist religious affiliation (Cramer, 1997; Kissinger, Lee, Twitty, & Kisner, 2009; Morrison, & Morrison, 2011); high frequency of religious service attendance (Cramer, 1997; Norton & Herek, 2013; Klotzbaugh & Spencer, 2014); conservative political ideology (Morrison & Morrison, 2011; Norton & Herek, 2013; Ali, Fleisher, & Erickson, 2015); lower educational attainment (Morrison & Morrison, 2011); and rural living (Herek, 1994; Cramer, 1997; Klotzbaugh & Spencer, 2014). Health professional role has shown mixed results as a predictor variable. For example, in Burch's (2008) study, physical therapists were more likely to be SGM-tolerant than nurses. However, no well-designed studies were found that revealed role-specific anti-SGM bias without confounders.

Knowledge and exposure as mediators of reduced bias. Mediators of more SGM-affirming knowledge or attitudes reported in past work include greater knowledge of homosexuality and greater exposure to lesbian and gay individuals (Phelan et al., 2017; Ali, et al., 2015). Transphobia and transnegativity in healthcare has only recently been evaluated within curricular interventions (Safer, & Pearce, 2013; Thomas, & Safer, 2015; Parkhill, Mathews, Fearing, & Gainsburg, 2014; Braun et al., 2017a; Erikkson &

Safer, 2016; Lelutiu-Weinberger & Pachankis, 2016; Braun Garcia-Grossman, Quinones-Rivera, & Deutsch, 2017b; Park, & Safer, 2018; Noonan et al., 2018). Intersex knowledge was included as a construct for examination in only one published study found in this review (Liang, Gardner, Walker, & Safer, 2017). Healthcare professional students have also reported a lack of education on transgender and intersex healthcare (Liang et al., 2017; Thomas & Safer, 2015; Seaborne, Prince & Kushner, 2015; Abon & Pratt-Chapman, 2018a and 2018b; Zelin et al., 2018).

Accurate knowledge about SGM health and healthcare needs are critical mediators of culturally-affirming care. Moscheta et al. (2016) reported that healthcare professionals often associated SGM with sexually transmitted diseases, resulting in more negative patient experiences. Henry, Campbell, and Willenbring (1990) reported that knowledge about AIDS, confidence in provision of AIDS care, and exposure to family members and/or close friends with AIDS moderated healthcare professional behaviors towards patients with AIDS. Greater knowledge about homosexuality was reported by Banwari et al. (2015) as the most significant predictor of SGM-affirming attitudes in their study of medical students and interns. Murphy (1992) reported that lack of knowledge of mental healthcare professionals resulted in bias. Accurate information on SGM has also proven to be a moderating force on willingness to care for SGM patients (Dijkstra et al., 2015; MacDonnell, 2009), including SGM living with HIV or AIDS.

Personal experience and exposure to SGM individuals has also been demonstrated to be a moderator of SGM bias. Phelan et al. (2017) reported that positive role modeling (p=.001) and more frequent interactions with SGM faculty, peers, and students (p<.001)

were the strongest predictors of reduced bias. However, negative role modeling of discriminatory behavior yielded greater implicit bias among students (p=.004) (Phelan et al., 2017). Earnshaw et al. (2016) reported that interpersonal interactions of Malaysian students of medicine and dentistry (n=1,158) with men who have sex with men (MSM) resulted in less biased attitudes. A study in South Africa showed similar results (Tucker et al., 2016).

Patient experiences of bias. Patient experiences and outcomes resulting from healthcare provider bias can range from discomfort to denial of care—or outright hostility. In a study conducted by Lambda Legal in 2010, 56% of lesbian, gay, and bisexual respondents, and 70% of transgender respondents had experienced denial of care or discrimination (e.g., healthcare professionals used harsh or abusive language, did not touch them, blamed them for their health status, or were physically rough). While the sample was a convenience sample, it was a large (n=4,916) sample with representation across the U.S. (Lambda Legal, 2010). Internalized homophobia and anticipation of discriminatory treatment can lead to healthcare avoidance (Wilkerson, Rybicki, Barber, & Smolenski, 2011). Negative patient experiences reported in Wilton and Kaufman's (2001) study of lesbian maternity care included patient discomfort, inappropriate services and hostility. Transgender patients routinely have to educate their providers about their basic healthcare needs (Grant et al., 2010; Kosenko, Rintamaki, Raney, & Maness, 2013; Parkhill et al., 2014)

Refusal to acknowledge sexual and gender identity is a more subtle form of bias. Beagan, Fredericks, and Goldberg (2012) reported that Canadian nurses who participated

in their qualitative study commonly felt that sexual and gender identity differences were irrelevant to healthcare except for sexual health. Nadal, Rivera, and Corpus (2010) described common "microaggressions" that impact SGM patients: 1) Heterosexist language; 2) Heteronormative/gender normative assumptions; 3) Assumption of universal SGM experience; 4) Exoticization; 5) Discomfort/disapproval of SGM experience; 6) Assumption of SGM pathology; 7) Denial of heterosexism; 8) Threat or harassment; 9) Environmental microaggressions; 10) Denial of bodily privacy; and 11) Systemic microaggressions.

Lack of Education and Training for Healthcare Professional Students

Healthcare professionals have reported inadequate training in a broad variety of fields. SGM physicians have reported lack of curricula on SGM topics in medical school (Eliason DeJoseph, Dibble, Deevey, & Chinn, P, 2011). Murphy (1992) described lack of training among mental health professionals to address gay and lesbian issues, lack of awareness of community resources, and lack of competence in addressing the impact of heterosexism and homophobia on patient sexuality and health. Lack of knowledge about lesbian health in maternity wards has been associated with poorer patient care (Dahl, Fylkesnes, Sorlie, & Malterud, 2013). Even among endocrinologists, education is woefully inadequate: In a recent study (n=411), 80% of practicing endocrinologists indicated they had treated a transgender patient, but 80.6% indicated they received no training on healthcare for transgender patients (Davidge-Pitts, Nippoldt, Danoff, Radziejewski, & Natt, 2017). A similar survey of plastic surgery and urology programs

showed that approximately one-third of programs in both specialties provided no clinical content related to transgender care (Morrison et al., 2017).

Healthcare professional students—including medical, nursing, social work, occupational therapy, and dental students—have indicated inadequate educational preparation (Parkhill et al., 2014; Banwari et al., 2015; Acker, 2017; Sanchez, Southate, Rogers, & Duvivier, 2017; Bonvicini, 2017). In a 2017 study, 75% of students of helping professions (n=600) reported inadequate exposure to transgender-related education and approximately half reported transphobic attitudes (Acker, 2017). This problem is not limited to one geographic area. Medical school administrators and students across the U.S., Canada, Sweden, Australia, New Zealand, and the United Kingdom have reported very limited content specific to sexual minority patients and almost no content on transgender, non-binary, or intersex patients (Obedin-Maliver, et al., 2011; Zelin et al., 2018; Sanchez et al., 2017; Taylor, Rapsey, & Treharne, 2018; Dowshen et al., 2013; Burke et al., 2015; Röndahl, 2009; Parameshwaran, Cockbain, Hillyard, & Price, 2017). Medical students in the UK (n=166) also reported infrequent role modeling of affirming behaviors (Parameshwaran et al., 2017).

A number of implementation factors are obstacles to SGM-relevant content in health professional schools. Among Swedish SGM nursing students, participants reported heteronormative educational experiences and passive leadership regarding SGM needs (Röndahl, 2005). A recent study in New Zealand confirmed this trend while noting that the lack of content in medical schools was attributed to limitations of time and curriculum space rather than negative SGM attitudes on the part of curriculum leaders (Taylor et al.,

2018). Similarly, Dubin, et al. (2018) noted a time limitation, but also cited lack of faculty competence and institutional support in advancing transgender health curriculum in medical school settings.

A Framework for Curricular Improvements

The AAMC Advisory Committee on Sexual Orientation, Gender Identity, and Sex Development created SGM-specific competencies to help health professional institutions improve training for students. The committee adopted the Physician Competency Reference Set (PCRS) as an overarching competency framework to reduce the educational trend of seeing population-specific competencies as an optional add-on, and to increase likelihood of uptake of granular SGM competencies within the already-required core curriculum (Eckstrand, Potter Bayer, & Englander, 2016). Competency qualifiers were written based on: 1) Known performance gaps described in academic literature, such as taking a sensitive history; 2) Presumed gaps based on absence of curricular content, such as how to provide gender-affirming care to transgender patients; and 3) Presumed gaps based on existing health disparities, such as counseling patients on vaccinations based on sexual orientation (Eckstrand et al., 2016). The AAMC mapping process resulted in 30 competency statements specific to SGM care, embedded within the 58-item overarching PCRS framework. Kirkpatrick, Eserhuizen, Jesse, and Brown (2015) referenced AAMC's work when advocating for an overhaul of nursing curricula to be SGM-affirming. Mulitalo and Romano (2015) encouraged Physician Assistant (PA) programs to adapt the AAMC competencies to improve PA program responsiveness to SGM health needs.

The Importance of Context in Health Professional Student Learning

The hidden curriculum. Learning interventions are often assumed to be effective at the curriculum level (Reisner, Radix & Deutsch, 2016). However, the concept of the "hidden curriculum"—or what students learn through the culture and interactions that take place in the academic environment rather than via the formal curriculum—is particularly powerful for student learners (Hafferty, 1998; Hafler et al., 2011; White, Kumagai, Ross, & Fantone, 2009; Batt-Rawden, Chisolm, Anton, & Flickinger, 2013; Chen & Yang, 2015; Fallin-Bennett, 2015). Students reported in a recent study of third-year medical students at one university feelings of powerlessness resulting from a conflict between what was formally taught in the pre-clinical curriculum and subsequently modeled in clinical years (White et al., 2015). One student said: "We have one set of faculty telling us X [one way] and the med school faculty telling us the other way. They need to be on the same team" (White et al., 2015). The hidden curriculum includes formal and informal behaviors of faculty and residents, advice from mentors, feedback and evaluation, promotion and tenure metrics, space and time constraints, salary incentives, and leadership vision and resource allocation (Hafler et al., 2011). Studies of the hidden curriculum in health professional schools have identified gendered stereotypes, sexual harassment, and ridicule of SGM as critical areas of concern that reinforce heteronormativity and sexism in both a benevolent and hostile form (Cheng, & Yang, 2015).

Anderson et al. (2009) found a direct correlation between student belief that their school cared about SGM health concerns and the level of affirmation evident in the

culture and climate of diversity within the school, defined as the "shared beliefs and values that guide the thinking and behavior" (p. 109) of the school community ($p<.001$). Caring about SGM health fundamentally means role modeling SGM-affirming clinical care (see "What to teach students about SGM patient safety in the clinical environment" below). However, affirming learning environments for students who identify as SGM may also include: places on application paperwork to voluntarily identify who they are (e.g. sexual orientation and gender identity); inclusion of SGM protections in nondiscrimination policies; consideration of SGM students in student policies; student-led affinity groups; mentorship from experienced faculty who are "out;" and institutional resources designated to be inclusive, such as having a dedicated LGBTQIA Resource Center. Inclusion of SGM students on curriculum task forces or other strategic bodies are also meaningful ways to create affirming environments for students. Faculty response when students disclose their sexual orientation or gender identity is also important: faculty should be inclusive rather than reacting negatively or assuming sexual orientation and gender identity are irrelevant to student experiences. Finally, if students raise questions about SGM-specific health care considerations or role model inclusive patient intakes, it is paramount that faculty encourage these questions and follow up with answers that are based on consensus from leading SGM organizations, if not evidence from the limited research conducted to date on SGM-specific needs.

What to teach students about SGM patient safety in the clinical environment. While affirming and inclusive learning environments are crucial in preclinical years, student learning continues on clinical rotations where faculty role model clinical care.

Creating a clinical environment that fosters student learning toward SGM-affirming patient care requires considerations of décor, patient flow, mission and vision statements, protocols and policies, documentation, and patient-provider communication (Wilkerson et al., 2011). SGM-affirming clinical environments may include prominently placed rainbow stickers, inclusive images on posters and patient education materials, and gender-neutral restrooms (Human Rights Campaign, 2018; Wilkerson et al., 2011; Dean, Victor, & Grimes, 2016). The Human Rights Campaign (HRC) and the Gay and Lesbian Medical Association (GLMA) created the Healthcare Equality Index (HEI) to help organizations identify organizational factors that lead to more SGM-affirming practices, such as nondiscrimination policies, cultural competency training, SGM-specific patient services, and equal benefits for SGM employees (Human Rights Campaign, 2018).

SGM patients often look for clues of safety, and students need to learn these cues in order to champion inclusive clinical care environment: Negative interactions from any employee at a healthcare facility may dissuade patients from returning (Wilkerson, et al., 2011). Patient flow considerations should account for the full spectrum of patient encounters from parking attendants and security guards to clinicians and staff (Wilkerson, et al., 2011). Diversity training should be inclusive of all staff, clinicians, and faculty and bolstered through publicized and enforced nondiscrimination policies and leadership role modeling (Wilkerson, et al., 2011). One study of a prominent academic medical center discovered that despite including SGM specifically in nondiscrimination policies, there was a lack of safety for SGM reported by students, employees, and clinicians that resulted in lack of disclosure (Chester, Ehrenfeld, & Eckstrand, 2014). The development

of protocols to address harassment in healthcare settings is a critical corollary to nondiscrimination policies (Chester et al., 2014).

Documentation is another important consideration for healthcare organizations that seek to be SGM-affirming. In Wilkerson et al.'s study (2011), one transgender patient noted: "Intake forms are one of the first introductions you have to an organization… and they are usually not trans-friendly" (p. 383). Patients and providers participating in focus groups reported the need for clear understanding of how inclusive intake questions related to patient health and information on who would see the information and where it would be stored (Wilkerson et al., 2011). Electronic health records that include sexual orientation and gender identity fields are also needed (Wilkerson et al., 2011). Healthcare providers have noted the potential for technology to assist with SGM-relevant health prompts that ensure appropriate, quality healthcare for patients based on individual risk and identity profiles (Wilkerson et al., 2011).

Patient interactions with clinicians strongly influence patient access to health care and adherence to clinical care recommendations. Many SGM patients, particularly those who are transgender, assume healthcare providers are unsafe until they see cues that indicate otherwise (Wilkerson et al., 2011). In Wilkerson et al.'s study (2011), one patient indicated that how a clinician reacted to their sexual orientation disclosure was their litmus test of whether to continue seeing that healthcare practice. Other focus group participants in the study indicated a preference for their healthcare provider to invite disclosure (Wilkerson et al., 2011). Cues for safe disclosure included use of the term

"partner" over "spouse," and invitations to disclose one's name and pronouns in use (Wilkerson et al., 2011).

Overall, past studies have shown that SGM patients benefit from organizational policies and protocols that provide supportive systems and knowledgeable, competent healthcare providers (Hanssman, Morrison, Russian, Shiu-Thornton, & Bowen, 2010; Wilkerson et al., 2011). Environmental factors like visual cues, inclusive intake forms, and nondiscrimination policies are critical for all healthcare environments—but much more detailed and reinforcing training opportunities are important for healthcare professionals who seek to regularly and expertly care for SGM. These patient-centered policies and protocols should be taught to health care professional students as well as modeled to eliminate the discordance between what is taught in the preclinical classroom and what is shown in clinical practice.

Past Interventions to Improve Student Preparedness with SGM Health

The literature search strategy started with a broad historical review and then focused on the last five years. From 1977 to 2018, forty-eight learning interventions across 31 healthcare professional schools of medicine, nursing, pharmacy, social work, and dentistry were identified to improve health professional student knowledge of sexuality, gay/lesbian health, and/or transgender health through systematic PubMed searches. Seventeen interventions were identified for practicing clinicians from 1989-2018. School interventions ranged from a single lecture or panel to integrated curricula across multiple years of study to elective clinical rotations. Practitioner settings ranged from primary care to specialty care practices, schools, and jail clinics.

The earliest learning interventions focused on attitudes about gay sexuality and sexual development (Carmichael, Tanner, & Carmichael, 1977; Hawton, 1979; Thomas, Scott & Brooks, 1980). Bauman and Hale's (1985) learning intervention focused on medical concerns for gay and lesbian patients, including alcoholism, depression, vaginitis, AIDS, giardiasis, and hepatitis—a trend that has continued to the present day (McGarry, Clarke, Cyr, & Landau, 2002; Kelley, Chou, Dibble, & Robertson, 2008; Eckstrand, Lomis, & Rawn, 2012). In the 1990s, Cramer's study (1997) began a focus on sexual minority identity, legal issues, and professional ethics that has continued to the present (Bidell, 2013; Grubb, Hutcherson, Amiel, Bogart, & Laird, 2013; Grosz et al., 2017; Taylor, Condry & Cahill, 2017; Sawning et al., 2017). Attention to transgender health concerns did not appear in the literature until the 2010s (Sequeira, Chakraborti,, & Panunti, 2012; Dowshen et al., 2013; Taylor, et al., 2017; Holthouser et al., 2017; Sawning et al., 2017; Maruca, Diaz, Stockman, & Gonzalez, 2018; Noonan et al., 2018; Safer & Pearce, 2013; Thomas & Safer, 2015; Erikkson & Safer, 2016; Park & Safer, 2018). Other more recent areas of focus include social determinants of health (Hawala-Druy & Hill, 2012; Cooper, Chacko, & Christner, 2018); SGM-affirming communication skills (Eckstrand, et al., 2012; Dowshen et al., 2013; Gelman et al., 2014; Bakhai, Shields, Barone, Sanders, & Fields, 2016); adolescent health counseling (Sullivan et al., 2013; Dowshen et al., 2016), de-pathologizing SGM (Bidell, 2013), intersectionality (Grubb et al., 2013), and lifespan approaches to care (Grubb et al., 2013). Only one intervention specifically focused on intersex concerns—and within that, only one aspect

of one portion of the intersex community (Neff & Kingery, 2016). This study is not available in the peer reviewed literature—only in the AAMC MedEd Portal.

The majority of published learning interventions to improve SGM medical curricula have been limited in duration and depth. Tulane University School of Medicine conducted a qualitative study assessing student feedback after a four-part educational series (Sequeira et al., 2012). Students reported lack of SGM content in current medical curricula and a need for SGM content to prepare them for work as physicians (Sequiera et al., 2012). The University of California began adding a two-hour session on SGM health as part of its Life Cycle Course in 2004 (Kelley et al., 2008). Since 2009, a student-led 10 contact-hour LGBTQI Health Forum has been offered to an interdisciplinary group of over 250 medical, nursing, pharmacy, dentistry, and physical therapy students (Braun et al., 2017c). Students at Case Western University self-organized a mandatory two-hour session for first-year medical students on SGM health, yielding improvements in student understanding of SGM terminology and greater confidence in providing care to SGM patients from baseline (Grosz et al., 2017). Students from the University of Pennsylvania developed a five-hour symposium on transgender healthcare that is now required of all medical students (Dowshen et al., 2016). The symposium approach aligns with Dubin et al.'s (2018) findings in their structured review of medical school curricula that found that in the rare medical school where transgender health was included in the curriculum, it typically consisted of one-time only learning sessions.

The University of Louisville School of Medicine has been a leader in research and education on SGM health. In 2010, Tamas, Miller, Martin, and Greenberg (2010)

conducted a study of clerkship directors to assess SGM health contact hours and found that the University of Louisville had 6 hours compared to the 3.5 hours reported nationally the American Medical Student PLoS One initiative as of 2010. The University of Louisville School of Medicine initiated four different SGM-related supplemental curriculum options for medical students of varying depth and breadth: First, a 2015 Community Forum on Transgender Healthcare facilitated conversations between healthcare professionals and transgender individuals in the community (Noonan et al., 2018). Second, Neff and Kingery (2016) piloted a problem-based learning case on complete androgen insensitivity to first year medical students and disseminated the case via the AAMC Med Ed Portal. Third, an interdisciplinary LGBT Health Certificate Program was launched which required certificate holders to attend at least 4 of 11 events in a lecture series, which yielded mixed results, but generally produced improvements in medical student knowledge and attitudes toward SGM (Sawning et al., 2017). Fourth, Leslie et al. (2018) facilitated a health equity intervention called eQuality that yielded statistically significant reductions in implicit bias among first- and second-year medical students.

Most rigorous systemic efforts have not used robust approaches to evaluate impact. For example, a 3-year HIV Primary Care Track was developed for internal medicine residents at Beth Israel Deaconess Hospital in Boston, MA. The program included LGBT-specific content, but primarily focused on improving clinical competence in caring for People Living with HIV (Fessler, Huang, Potter, Baker, & Libman, 2017). Only four trainees were recruited annually, and evaluation was limited to descriptive

statistics (Fessler et al., 2017). Similarly, The Penn Medicine Program for LGBT Health is an exemplar of how training can be embedded within a larger context of culture and system changes (Yehia et al., 2015) while lacking robust evaluation approaches. The Penn program was guided by a strategic plan with five focus areas: Institutional climate and visibility, heath education, research, patient care, and community outreach (Yehia et al., 2015). However, evaluation of the Penn Medicine Program for LGBT Health was limited to counts of lectures, studies and meetings. Similarly, the University of San Francisco School of Nursing developed partnerships with clinical sites where Family Nurse Practitioner (FNP) students could elect didactic and experiential learning for affirming SGM health care—yet no formal evaluation of learning outcomes has been conducted (Rowniak & Selix, 2016).

There have been only a few well-designed evaluations of SGM-focused health student learning interventions. Carmichael, Tanner, and Carmichael's (1977) use of semantic differentiation was an elegant, well-justified evaluation strategy; however, the scope of the study was very limited. Kwon & Hugelshofer (2012) conducted a well-designed study with validated scales, controlling for potential sociodemographic confounder variables. The University of California Davis (UC Davis) is the only institution that has published a learning intervention rigorous in breadth of integration at a systems level as well as depth of evaluation, designed to improve student competence in SGM healthcare (Ton et al., 2016).

Table 1.
SGM Health Curricular Interventions 2013-2018

Author/ Year	Targeted learner	Format	Content	Evaluation Approach
Bakhai et al. (2016) Johns Hopkins School of Medicine	Medical students (M3-M4)	2-hour session with small group discussion (mandatory, embedded in required pediatric clerkship)	Communication skills	Pre/post surveys (n=39) measuring self-reported comfort, self-efficacy, and preparedness in caring for SGM youth showed improvements for all measured constructs ($p<.001$).
Bidell (2013) Hunter College of the City University of New York	Graduate-level counseling students	Summer session course with lectures, community panels, group discussion, video, and journaling (mandatory, embedded into a course)	Terminology; Stereotyping Pathology and SGM; Theories of sexual orientation and gender identity; Civil rights history; Legal protections and discrimination; HIV/AIDS; SGM-specific healthcare needs; Mental health	Learner surveys (n=23) including the Sexual Orientation Counsellor Competency Scale (SOCCS, Bidell, 2005) and the Lesbian, Gay, and Bisexual Affirmative Counseling Self-Efficacy Inventory (LGB-CSI; Dillon & Worthington, 2003) measured knowledge, attitudes, and skills. Paired *t*-tests for pre/post surveys for the intervention group yielded no significant differences. Independent *t*-tests comparing intervention to a comparison group showed large effect sizes between the two groups' change scores.
Braun et al. (2017b) University of California, San Francisco	Medicine, pharmacy, nursing, sociology, and dentistry students.	10-session, lunch-hour elective course	Introduction: definitions, core concepts, local resources; Epidemiology, health disparities, and general primary care; Psychiatry and transgender care; Transgender care for the gynecologist, gender-affirming surgical options; Care for gender-nonconforming and transgender youth and adolescents; Primary care needs, hormone replacement therapy, and surgical options; Patient panel—the patient experience; Policy and health	Baseline, immediate posttest, and 3 month posttest surveys, including validated 9-item transphobia scale to assess knowledge, attitudes, and beliefs (n=46) (Paired *t*-tests for normally distributed data, Wilcoxon sign-rank or Mann-Whitney test for non-normal data, McNemar exact test for categorical data). Transphobia scale showed strong reliability (alpha = 0.82) and improvement in attitudes by 18% pre/post.

			insurance reform; Urologic surgical care for transgender patients; History of transgender medicine	
Braun et al. (2017c) University of California, San Francisco	Medical, dental, pharmacy, nursing, and physical therapy students	Student-organized forum (10 hours) with elective credit Includes: Plenary sessions Breakout sessions Networking sessions	LGBTQI health disparities Barriers to care; Communication skills; Terminology; Patient interviewing techniques; Patient panel; Optional clinical simulation with standardized patients	Pre/post survey of perspective, beliefs and confidence (paired *t*-test) (n=140 pre; n=192 post): Participants noted statistically significant differences post-forum on knowing where to find information and confidence conducting accurate and inclusive medical history) ($p<.01$)
Calzo, Melchiono, Richmond, Leibowitz, & Argenol (2017)	Interprofessional post-graduate students	4-module, including didactic lecture, readings, case discussion, debate and reflection for interprofessional leadership trainees (mandatory)	LGBT adolescent health	Four years of small cohort data rating confidence before and after case discussion and qualitative data. No statistical analyses conducted. Pre/post data did not show clear improvements to learner confidence.
Carabez et al. (2015) School of Nursing, San Francisco State University	Nursing students	Educational readings, 2-hour lecture, and scripted interview (elective)	Research training; Qualitative interviewing techniques	Students conducted structured interviews with 268 nurses in the San Francisco Bay area. Evaluation focused on themes from interviews rather than student learners.
Cooper et al. (2018)	Medical students (M3)	One-hour, mandatory lecture for third-year medical students enrolled in a specific course (n=180)	LGBT social determinants of health	Paired *t*-test ratings of learners (n=63) showed statistically significant improvements across five learning objectives.
Dowshen et al. (2013) University of Pennsylvania Perelman Schools of Medicine, Nursing, and Dentistry	Medical students (clinical)	Single lecture on transgender health (mandatory, embedded in family medicine clerkship)	Not described, but presumed based on evaluation items: Sexuality and gender concepts; Health disparities; Sexual coercion; Cancer screening; Laboratory screening before hormone; Therapy; Cross-hormonal therapy risks; Timing of puberty blockers; History	Post-clerkship survey (n=204) compared knowledge, attitudes, and skill items of intervention arm to control group of students, showing improvement in the intervention group for the following measures: Understanding of sexuality and gender, population health outcomes, comfort with taking a history and exam for SGM patients,

			and physical exam; Communication skills; Transgender resources	communication around cross-hormonal therapy, and identification of transgender-affirming resources.
Dowshen et al. (2016) University of Pennsylvania Perelman Schools of Medicine, Nursing, and Dentistry	Medical students	5-hour symposium (originally student initiated, now mandatory)	Transgender health; Panel of youth and parents; Adolescent medicine expert; Mental health expert; Urologist	No evaluation reported
Erikkson & Safer (2016) Boston University School of Medicine	Medical students (M1)	Single lecture (mandatory, embedded in course)	Durability of gender identity	Chi-squared tests compared relative frequencies pre/post for audience response question about gender etiology (n=43). McNemar's test assessed pre (n=56) /post (n=121) trends.
Gacita, Gargus, Uchida, Garcia, & Macken (2017) Northwestern University Feinberg School of Medicine	Institutional community members, including students, staff and faculty	30-minute elective, online module	SafeSpace training; Introduction to basic information and terminology	Statistically significantly improved confidence in communication based on two non-validated paired *t*-tests of pre/post-module questions (n=89).
Gelman et al. (2014) University of Pittsburg School of Medicine	Medical students (M2)	45-minute standardized patient simulation on SGM adolescent who has been bullied (not stated, but presumed mandatory, embedded in M2 Advanced Medical Interviewing course)	Advanced medical interviewing skills; Screening for depression; Screening for bullying; Communication skills	Pre/post surveys revealed modest self-reported improvement in preparedness in caring for SGM adolescents.
Grosz et al. (2017) Case Western University School of Medicine	Medical students (M1)	Student-led 2-hour session for M1 students (mandatory) Student-led presentation Patient panel Small-group session	Terminology; Legal protections; SGM patient concerns	Pre/post paired *t*-tests (n=73) of 5-point Likert items revealed student-perceived preparedness and comfort significantly improved post-intervention. Scales not validated.

Grubb et al. (2013) Columbia University	Medical students (clinical)	1-hour lecture and 1-hour panel (mandatory, embedded in clerkship)	Terminology; Health disparities Minority stress model; Life course perspective; Intersectionality; Social ecology	Pre/post surveys assessed knowledge and attitudes related to learning objectives. Results not reported.
Hernandez, et al. (2015) University of California San Diego School of Medicine	Medical students (M2)	Lecture, panel, problem-based learning, and small group break-out session with videos (not stated whether mandatory or elective)	Cultural knowledge; Health disparities; Patient Encounters; Care improvements	Paired *t*-test (n=133) of non-validated pre/post measures that assessed knowledge, comfort, and confidence in caring for SGM patients, and showed statistically significant posttest improvements.
Holthouser et al. (2017) University of Louisville	Medical students in years 1 (M1) and 2 (M2)	Integrated curriculum for M1 and M2 students entitled "eQuality: Leading Medical Education to Deliver Equitable Quality Care for all People, Inclusive of Identity, Development, or Expression of Gender/Sex/ Sexuality" (mandatory/ same intervention as Leslie, 2018)	Breast and pelvic exam Cultural competency symposium (Leslie, Steinbock, Simpson, Jones, & Sawning, 2017); DSD lecture and patient panel; DSD-affected case (Neff & Kingery, 2016); Genital-rectal exam; Health screening guidelines; Healthcare system gaps in care; Healthcare disparities; Taking a patient history and physical exam; Implicit association test/ debrief; LGBT community member speed meeting; LGBT patient panel; Personal vs. professional obligations; Queer teen case; Sexual ethics workshop; Sexual health history; Sexuality over lifespan; Sexually transmitted infection; prevention; Transgender hormone use	Formative evaluation: 23 engaged faculty and 320 student-patient interactions. Aimed to provide community engagement, school climate change, and a model educational and system innovation for replication by other schools. See Leslie et al. (2018) for impact evaluation.
Johnson, Rullo, & Faubion (2015) May Medical School, Rochester, MN	Medical students (M1)	1-week elective with lecture, film, shadowing, role-play, and student presentations	Sexual health skills and perspectives; Sex across the age and health spectra; What patients are and	Pretest, immediate posttest, and 3-month follow up (non-validated) surveys assessing knowledge and attitudes relevant to course content showed improved openness and

			aren't asking; Some content on SGM sexuality	knowledge at immediate and 3-month posttest intervals.
Kidd, Bockting, Cabaniss, & Blumenshine (2016) New York Presbyterian (Columbia University)	Medical residents (PGY1-PGY4) (mandatory)	90-minute workshop with didactic content and role play (mandatory)	Key concepts and terminology for transgender healthcare; Prevalence statistics; Gender identity questions and considerations; Clinical vignettes for role play to support strategies for maintaining respect and empathy for patients	Paired *t*-tests for pretest and immediate posttest (n=22) surveys showed improved post-workshop empathy, knowledge, comfort, and motivation scores. Unmatched 90-day follow up (n=20) scores showed a return to baseline scores.
Leslie et al. (2017) and Leslie et al. (2018) University of Louisville	Medical students in years 1 (M1) and 2 (M2)	Health equity curriculum (eQuality): 50.5 hours of new or revised curriculum including lecture, standardized patients, problem-based learning, small group discussions, patient panels, and reflective writing (mandatory/ same intervention as Holthouser et al., 2017)	Curriculum available in Holthouser et al. (2017).	Paired *t*-tests (M1 n=72; M2 n=102) assessed implicit attitude differences between pre/post; independent *t*-test measured differences between M1 and M2 groups. Posttest results showed a small effect size on M2s for sexuality bias (p=.01, Cohen's d=.25) and race bias (Cohen's d=.22), but not for M1 (p=.09).
Maruca et al. (2018) University of Connecticut School of Nursing & University of Central Florida College of Nursing	Preclinical, undergraduate BSN nursing students across two schools enrolled in psychiatric mental health course	Didactic lecture and simulation exercise (mandatory)	Transgender case focusing on assessment of anxiety, communication	The paired pre-test/post-test design (n=47) used the validated Gay Affirming Practice Scale (Crisp, 2006) and assessed change using the Wilcoxon signed-rank test, showing posttest improvements in ability to provide affirming practice, but no difference in attitudes or beliefs due to high levels of self-reported acceptance of diversity at baseline.
McNiel & Elertson (2017) University of Wisconsin-Oshkosh, School of Nursing	Baccalaureate nursing students	Reflection and small group exercises Lectures (mandatory for 2 participating classes of students)	LGBTQ health needs; Health screenings for LGBTQ people Surgical intervention options for transgender people; Coverage for health services	Non-validated 4-item self-report knowledge and awareness survey and reflective journaling

Mehringer, Bacon, Cizek, Kanters, & Fenimore (2013) Case Western University School of Medicine	Medical students	2-hour seminar with lecture, patient panel, case studies, and small group discussion (not stated, but appears mandatory)	Terminology; Health disparities; Role of healthcare providers in mitigating barriers to care	Wilcoxon signed-rank test (n=235) showed statistically significant increases in self-reported knowledge, preparedness, and comfort in caring for SGM patients. Scales were not validated.
Neff & Kingery (2016) University of Louisville	Medical students (M1)	Problem-based learning case (mandatory)	Androgen insensitivity	From pre- (n=155) to posttest (n=144), range of correct responses improved from 29-94% to 90-99%.
Noonan et al. (2018) University of Louisville	Healthcare professionals and transgender community members	Community forum discussion (n=59) (elective)	Using intergroup contact theory and CBPR, a community engaged forum inclusive of healthcare providers and transgender community members (n=15) explored the transgender community's experience with healthcare and how to address specific challenges. The forum informed the intervention described in Leslie et al. (2018)	Problems identified in the forum (n=59) included: 1) Need for competent and confident providers, 2) problem of patients as educators, 3) clinic climate, and 4) need for systems change Post-forum survey indicated top priorities to improve transgender healthcare: 1) Multidisciplinary clinic, 2) trans-knowledgeable clinician network, and 3) education for support staff.
Park & Safer (2018) Boston University School of Medicine	Medical student clinical elective	Integration within elective clinical rotation	M1 content on biologic evidence for gender identity M2 content on cross-hormonal therapy Clinical interaction with transgender patients	Chi-squared tests for independence compared frequencies of pre/post survey responses (n=20) on paired, non-validated questionnaires. Results showed increases in self-reported comfort and readiness in caring for transgender patients.
Parkhill et al. (2014) Wegman's School of Pharmacy, Rochester, New York	First-year pharmacy students	1-hour lecture, 2-hour transgender moderated panel, and 1-2 page self-reflection essay (mandatory, embedded in Introduction to Diversity course)	Terminology Respectful behaviors Healthcare experiences Panelist Q&A	91% of students (n=78) agreed they understood how to show respect to transgender patients. Qualitative (phenomenological) study revealed two overarching themes and seven subthemes, including: Optimizing interactions with

				transgender patients in pharmacy (subthemes: How to communicate with transgender patients; how to apply to pharmacy setting; respect) and understanding the transgender population (subthemes: Learning about transition process; difficulties and challenges that they face; diversity of transgender population; right to live life in own way)
Rowniak & Selix (2016) University of California, San Francisco	Family Nurse Practitioner students	Elective one-day clinical rotation with lectures, readings and videos	Problem-focused sexual history and examination of high-risk SGM patients; Five-P assessment (partners, practices, past history of STDs, protection from STDs, pregnancy plans)	No formal assessment; informal student feedback from experiences.
Safer & Pearce (2013) Boston University School of Medicine	Medical residents (M1-M4, intervention for M2 only)	Single lecture (mandatory, embedded in course)	Durability of gender identity	Chi-square or Fisher exact tests were used for non-validated dichotomous outcome measures (comfort versus discomfort) in caring for transgender individuals. Logistic regression with covariates of age and sex revealed that older students were more likely to report discomfort (p=.02) regardless of sex or year in school. Statistically significant improvements in willingness to care for transgender patients.
Sawning et al. (2018) University of Louisville	Medical students	Certificate program (4 of 11 lectures required) (elective)	LGBT Community panel; Leader's role in addressing LGBT health; Working with LGBT patients; How to make your practice LGBT-affirming; Cultural Competency; LGBT Health Disparities; Taking an Inclusive History;	Knowledge scores (n=39) significantly increased post-test with a large effect size (Cohen's D=.90, p<.001). Attitude changes assessed with Wilcoxon signed-rank tests were mixed.

			Ethical and legal Issues; Transgender health; LGBT mental health; Meeting needs of bisexuals	
Solotke, Sitkin, Schwartz, & Encandela (2017) Yale University School of Medicine	Medical students	Curriculum integration by opt-in faculty teaching mainstream curriculum	12 tips provided, but specific content not described	Not described
Strong & Folse (2015) Wesleyan University	Undergraduate nursing students	45 minute power point presentation (mandatory for participating classes)	Terminology Health disparities Medical needs of transgender patients	The Attitudes Toward Lesbians and Gay Men Scale showed internal consistency reliability (alpha=.95) as well as improved attitudes with paired sample *t*-tests (n=58).
Sullivan et al. (2013) Vanderbilt University School of Medicine	Medical students specializing in pediatrics and OBGYN	2-hour session with audience-response power point and group discussion (not stated, but appeared to be mandatory)	Terminology; Patient assessment; Health concerns; Practical adolescent advice; Barriers to care; Communication skills; Sexuality; Sexual orientation; Gender identity	Pre/post surveys adapted from Sanchez et al. (2006) and Eckstrand (2012) assessing attitudes, knowledge, and behavioral intention resulted in 82% of students feeling more prepared to care for SGM and more positive attitudes regarding same-sex attraction and behavior.
Taylor et al. (2017) University of Bristol (United Kingdom)	Second year students of medicine enrolled in Disability, Disadvantage, and Diversity course	Half-day, student-led teaching session with lecture and workshop, including role play and small group discussion (mandatory)	Legal rights; Transgender health; Health disparities Gender dysphoria; Heterosexism; Transphobia; Sexual identity	Pre/post non-validated questionnaire measuring self-reported competency (n=350). Themes identified from free-text feedback included improved awareness of SGM healthcare disparities and challenges, practice developing clinical communication skills, and value of student and SGM facilitators.
Thomas & Safer (2015) Boston University School of Medicine	Medical residents	Single lecture (elective)	Durability of gender identity	Percent of residents (n=36) who felt able to assist with hormonal therapy for female-to-

				male (FtM) patients increased significantly ($p<.001$).
Ton et al. (2016) University of California Davis School of Medicine	Faculty developing content for medical students	4-year sexual orientation and gender identity curriculum (invitation to key faculty; not mandatory)	Map SOGI competencies across 4 years and link with existing graduation competencies; Train participants on SOGI educational resources; Develop implementation plan; Motivate participants to support curricular efforts	McNemar's test assessed baseline (n=26), immediate posttest (n=22), and 6-month posttest (n=18) faculty responses to a 10-item survey. Implementation of 76% of planned curriculum (N=72) was accomplished within 2 years.
Vance, Deutsch, Rosenthal, & Buckelew (2017) University of California, San Francisco	Medical students (M4) including pediatric and psychiatry interns and nurse practitioner students on a one-month adolescent/ young adult medicine rotation	6 online modules and an observation of a multidisciplinary pediatric gender clinic (elective)	Terminology; Taking a gender history; Psychosocial history; Physical examination; Patient assessment; Psychosocial and medical planning	Wilcoxon signed rank tests of pre/post surveys (n=20) measuring knowledge showed statistically significant knowledge change posttest as well as strong satisfaction (>4.4 on a 5-point scale). Measures were not validated.
Yehia et al. (2015) University of Pennsylvania Perelman Schools of Medicine, Nursing, and Dentistry	Medical, nursing, and dental students	One-day planning retreat with 60 faculty, students, staff, and SGM leaders yielding an interprofessional program (10 lectures) (described the creation of an intervention, not its implementation)	Institutional climate and visibility; Health education Research; Patient care; Community outreach	Collection of SOGI; addition of SGM questions to annual graduate medical education climate survey; OUTlist of students, faculty, staff; delivery of 10 lectures; interprofessional seminars with 170 attendees; 6 LGBT research studies; 3 presentations at national meetings; development of patient brochure; listing as a leader in HRC Healthcare Equality Index; SGM networking and reception events
Yingling, Cotler, & Hughes (2017) University of Illinois at Chicago, School of Nursing	Family Nurse Practitioner students	Module on SGM health and in-class discussion (mandatory)	Implicit bias; Lesbian health Gay men/MSM; Bisexual health; Transgender health Adolescent LGBT health	No formal evaluation. Student feedback has been positive. Faculty feedback has been mixed with unanticipated concerns about presenting homosexuality as normative.

Translational Nature of Past Studies

Few studies have taken a systems approach to curricular innovation and integration (Ton et al., 2016; Holthouser et al., 2017; Yehia, 2015). Holthouser et al. (2017) and Leslie et al. (2018) fostered curricular improvements at the University of Louisville that included 50.5 hours of SGM content. Outcomes showed no effect for M1 students and only a small effect for M2 students (Leslie et al., 2018). Yehia et al. (2015) described a process of curriculum mapping by faculty leaders to increase curricular integration but did not describe outcomes of implementing new curricula.

UC Davis highlighted the critical role of early stakeholder engagement in organizational change. The Dean of the School of Medicine invited 50 key stakeholders from four groups (i.e., faculty champions, program/course directors, cultural competency educators, and students) to map desired competencies to existing curricular themes in specific years of medical training during a one-day curriculum retreat. Sample SGM competencies were provided that integrated with the Tool for Assessing Cultural Competence Training (TACCT) and the AAMC SGM competencies framework (Ton et al., 2016; AAMC, n.d.; Hollenbach et al., 2014). Twenty-eight stakeholders accepted the invitation to create a curriculum plan at the retreat. Participants completed baseline, post-retreat, and 2-year post-retreat follow up surveys, revealing that of 72 competency areas planned, 76% had been implemented into the cultural competency curriculum within two years (Ton et al., 2016). Barriers to implementing the planned curriculum included faculty resistance, lack of time and space in the existing curriculum to incorporate new content' and lack of skill to develop relevant curricular content—faculty who reported

more barriers were less likely to prioritize SGM curricular content (Ton et al., 2016; Tamas et al., 2010).

Key stakeholder engagement has potential to diffuse the impact of an intervention broadly. Solotke et al. (2017) noted that "integration of [SGM] content across the curriculum provides learners with educational reinforcement and opportunities to encounter SGM content from numerous biomedical and psychosocial perspectives, facilitating integration across content areas" (Solotke et al., 2017, p. 2). Zelin et al. (2018) also recommended an integrated approach to SGM curriculum within the broader medical curriculum, leveraging materials from AAMC's MedEd Portal. Fallin-Bennett (2015) challenged curriculum reformers to consider "fundamental values and messages in academic medicine. Addressing the hidden curriculum requires changing the learning environment by challenging policy, systems, environmental, and communication norms that reflect, perpetuate, and reinforce bias through inertia (Hafferty, 1998). Solotke et al. (2017) offered 12 tips for curricular integration, many of which require alignment of the "hidden curriculum" with the formal curriculum (Hafferty, 1998; Maudsley, 2001).

Overall, past interventions have not succeeded in both curricular integration and outcomes evaluation. No interventions have attempted to measure patient outcomes as a result of curricular innovation.

Recommended Content for Future Learning Interventions

While heteronormativity, homophobia, transphobia, and other forms of bias are pervasive—training has shown promise in improving healthcare professional knowledge and attitudes toward SGM patients (Dijkstra et al., 2015). Wilton as early as 1999 described homophobia as "neither inevitable nor universal, rather it is culturally specific

and culturally constructed" (p. 154). Accurate knowledge about gay and lesbian life and health has been associated with less anti-gay bias (MacDonnell, 2009). Formal education about the importance of social inclusiveness and critical thinking has been associated with more affirming nursing practices for lesbian health (MacDonnell, 2009).

Past research indicates a need for education and training on basic lifestyle, patient interviewing, and healthcare factors affecting SGM. Moscheta et al. (2016) suggested that healthcare professionals need training in communication skills, critical thinking about what constitutes SGM expertise, and disassociation of SGM-status with sexually transmitted disease. Beagan, Fredericks, and Goldberg (2012) suggested a need for nursing education to differentiate between stereotyping and evidence-based generalization. Murphy (1992) indicated a need for mental health professionals to receive training on basic lifestyle differences of sexual minorities and the impact of heterosexism and homophobia on the lived experiences of SGM. Reflecting the slow status of change, Rutherford, McIntyre, Daley, and Ross (2012) echoed the same needs twenty years later for mental health professionals, suggesting that mental healthcare professions receive education on basic SGM terminology, patient interviewing, and the negative health impact of heterosexism and homophobia. Claes and Moore (2000) suggested a need for healthcare professional understanding of the needs of aging SGM.

Other recommended content includes biological perspectives, life span perspectives, self-reflection on microaggressions, and direct exposure to diverse patients. Park and Safer (2018) reported the need for experiential training in addition to didactic content on the biology of gender identity and the clinical management of cross-hormonal therapy. Brennan-Ing, Seidel, Larson, and Karpiak (2014) suggested that those who work

with aging SGM patients should have a greater understanding of basic support needs for this demographic, such as housing, financial support, and social isolation challenges. Cartwright, White, Willmott, Parker, & Williams (2017) specified the need for physicians to consider the unique circumstances of advanced care planning for SGM patients and caregivers. Dean et al. (2016) recommended that diversity training directly address microaggressions and the development of schemas in a non-confrontational way. They also suggested group work, language of "personal responsibility" around future actions, and self-education as promising educational strategies (Dean et al., 2016). Noonan et al. (2018) recommended that medical students have greater exposure to transgender community members during training. Students in White et al.'s (2015) study agreed, indicating that interaction with SGM patients, personal experiences, exposure to SGM faculty, required clinical training, personal reading, and conferences to improve student comfort in the provision of SGM patient care.

Inferences for Forthcoming Study

Strengths and Weaknesses of Extant Research

Current research on healthcare professional competence in provision of care to SGM suffers a number of limitations. There is lack of consensus regarding what, specifically, healthcare professional students should know about SGM health and healthcare to be competent (Bonvicini, 2017). In Utamsingh, Kenya, Lebron and Carrasquillo's (2017) systematic review of published literature related to transgender health in medical curricula, zero publications indicated curriculum content relevant to non-binary gender populations. Most educational interventions attempting to remedy this learning gap are severely limited in duration. Utamsingh et al.'s (2017) systematic review

noted that most educational interventions to improve SGM healthcare provider competence consisted of only one or two lectures—a practice that does not align with knowledge translation theory or retention of information in clinical practice. This finding is supported by the summary of prior interventions listed in Table 1.

Few of the interventions read for this literature review documented a methodological lens or theoretical framework. However, the focus on knowledge, attitudes, skills, and variations of attitudes (comfort, confidence) suggest that all interventions aligned with the four learning levels proposed by Kirkpatrick: Reaction, learning, behavior, and results (Kirkpatrick & Kirkpatrick, 2016). Knowledge, attitudes, and skills are often proximal endpoints for competency (Mehay & Burns, 2012; Sanchez et al., 2006; Miller, 1990).

Four studies leveraged qualitative data for diverse purposes. Noonan et al. (2018) used a community-based forum to identify critical themes for educational intervention. Carabez et al. (2015) taught nursing students how to conduct qualitative research by having students interview an impressive number of nurses (n=268); however, the evaluation focused on the training experiences of the interviewees already in practice, rather than the learning outcomes of the nursing students. Sequeira et al. (2012) conducted thematic analysis of participant feedback on their learning intervention. Two researchers used free-text student feedback to identify areas of intervention strength and weakness (Parkhill et al, 2014; Taylor et al, 2017). Parkhill et al. (2014) did identify a methodological perspective (phenomenological), though the methods did not align with a phenomenological lens since qualitative data were limited to free-text fields rather than robust exploration of student experiences.

While methodological standards for evaluating SGM healthcare have not been defined (Solotke et al., 2017; Bonvincini, 2017), a comparative effectiveness review published by the Agency for Healthcare Research and Quality (AHRQ) reported that no existing trainings for SGM health have been rigorously evaluated (Butler et al., 2016). The AHRQ review noted the following methodological weaknesses of past work: Absence of a control group, self-selection bias (high degree of familiarity with SGM prior to intervention), and lack of longitudinal data collection to measure impact of interventions over time (Butler et al., 2016). Dubin et al. (2018) noted, "Currently, transgender medical education is largely composed of one-time attitude and awareness-based interventions that show significant short-term improvements but suffer methodologically from the lack of long-term assessment, the lack of emphasis on clinical skills, or the evaluation of patient outcomes" (p. 386).

In support of AHRQ's findings, the majority of studies found in this literature review were quantitative studies with paired comparisons of pretest/posttest results (Carmichael et al., 1977; Hawton, 1979; Thomas et al., 1980; Bauman & Hale, 1985; Cramer, 1997; Dongvillo & Ligon, 2001; McGarry et al., 2002; Kelley et al., 2008; Braun et al., 2017b; Braun et al., 2017b; Vance et al., 2017; Hawala-Druy & Hill, 2012; Grubb et al., 2013; Mehringer et al., 2013; Sullivan et al., 2013; Grosz et al., 2017; Safer & Pearce, 2013; Thomas & Safer, 2015; Hernandez et al, 2015; Erikkson & Safer, 2016; Gelman et al., 2014; Bakhai et al., 2016; Kidd et al., 2016; Neff & Kingery, 2016; Leslie et al., 2018; Sawning et al., 2018; Maruca et al., 2018; Gacita et al., 2017; Cooper et al., 2018). A few studies used control or comparison groups (Rutter, Estrada, Ferguson, & Diggs, 2008; Kwon & Hugelshofer, 2012; Bidell, 2013; Dowshen et al., 2013). A few

studies followed up to assess learning retention over time with mixed results (Ton et al., 2016; Kidd et al., 2016; Johnson et al., 2015). Even fewer studies reported student self-reflection, clinical practice or formal assessment (Sawning et al., 2017; Parkhill et al. 2014). Lelutiu-Weinberger and Pachankis (2016) introduced a longitudinal training with robust evaluation measures, but still noted the need for refresher trainings.

The AHRQ report also noted significant design weaknesses in current evaluations of SGM health curricula, including low response rates and high likelihood of social desirability bias in posttest measures (Butler et al., 2016; Kwon & Hugelshofer, 2012). Zelin et al. (2018) pointed out a weakness of self-reported data in their own study, highlighting the discordance between the high percentages of SGM patient experiences of inequitable care compared to the high self-reported comfort of providers in caring for SGM. Park and Safer (2018) also noted the limitations of self-reported data. Sample sizes for past educational interventional research have also been small. For example, Sawning et al. (2018) obtained data from only 39 medical students to the LGBT Health Certificate program for their study. Mandatory interventions have reached larger groups of students, but participation in the research component is often less than 50% of the eligible sample (Grosz et al., 2017).

A major limitation to the research has been limited availability and use of validated scales. Of the studies reviewed, only a handful used validated scales (Dongvillo & Ligon, 2001; Rutter et al., 2008; Kwon & Hugelshofer, 2012; Bidell, 2013; Strong & Folse, 2015; Braun et al., 2017c; Leslie et al., 2018). Showing a lack of alignment between content and evaluation, one study used a validated tool (the GAPS) that assessed gay affirming care for a transgender-focused learning intervention (Maruca et al., 2018).

Most investigators crafted satisfaction, knowledge, attitudes, and experience questions to fit the specific learning objectives of their study (Kelley et al., 2008; Parkhill et al., 2014; Braun et al., 2017b). Another concern is use of validated scales measuring outdated constructs. For example, while validated tools exist that measure explicit homophobia, more subtle homonegativity scales need to be developed to keep pace with social change (Dongvillo & Ligon, 2001).

Only three studies took a systems approach to evaluating the results of their work (Yehia et al., 2015; Park & Safer, 2018; Ton et al., 2016; Holthouser et al., 2017). Both Yehia et al. (2015) and Holthouser et al. (2017) described strong, community-engaged approaches with a focus on multi-prong systems-level change. Holthouser et al. (2017) leveraged Glassick et al.'s (1997) research standards to strengthen the creation, implementation, and dissemination of the University of Louisville's curriculum and climate improvements for health professional students. Multi-prong systems approaches have been recommended as better suited to influencing deeply entrenched implicit bias. Brennan et al. (2012) recommended a variety of strategies to optimize learning including simulation, case studies, ethics discussions, films, and clinical rotations. Anderson et al. (2009) also endorsed panels, standardized patient encounters, and clinical rotations. As far back as 1991, Wells reported that multiple reinforcing teaching strategies such as use of video, discussion, panels, and didactic content was most effective in mitigating homophobia among social workers. Anderson et al. (2009) suggested the importance of integrating curricula across multiple courses in dental school including ethics, communication, and public health.

Gaps that Need to be Addressed

Many assessments have indicated lack of education and knowledge of healthcare providers concerning SGM health and healthcare needs (Korpaisarn & Safer, 2018; Heard et al., 2018; Zelin et al., 2018; Klein & Golub, 2016; Banerjee, Walters, Staley, Alexander, & Parker, 2018). Banerjee et al.'s (2018) study noted the need for more research about healthcare professional knowledge, attitudes, and behaviors regarding SGM. Zelin et al. (2018) specifically recommended more mixed methods research to expand understanding of medical student confidence and competence in provision of care to SGM. Burke et al. (2015) recommended that future research move beyond knowledge and attitudes to assess behaviors. Fallin-Bennett (2015) suggested that more work examine empathic concern (emotional empathy) and perspective-taking (cognitive empathy) as mediators of anti-SGM bias. Kwon and Hugelshofer (2012) recommended that future studies include objective behavioral measures and attention to anti-bisexual and anti-transgender bias. Kwon and Hugelshofer (2012) also suggested greater attention to the content and approach of interventions to understand the methods by which interventions might produce attitude change.

Major challenges include lack of faculty with expertise to adequately train peers and students (Banerjee et al., 2018), lack of awareness and interventions to mitigate unconscious bias (Taylor et al., 2018), and current political and religious polarization that exacerbate tensions between physician autonomy and requirements to treat all patients (Prairie, Wrye, & Murfree, 2018). Time and space constraints in existing core curricula also remain challenges (Taylor et al.), particularly for consolidated preclinical curricula.

Based on literature review findings, SGM health professional student interventions and their evaluations should adopt a combination of the following features:

- Use theory explicitly
- Use multiple approaches to learning—including interactive learning and self-reflection
- Investigate the mechanisms of learning—not simply knowledge gains
- Integrate learning across mainstream curriculum (i.e., not elective/optional)
- Account for known sociodemographic predictors of bias
- Account for self-selection
- Account for social desirability bias
- Directly address professional ethics and how to manage personal conflicts
- Align learning with existing core competencies to reduce the burden on faculty
- Focus evaluation on practice behaviors and results—not just reaction and learning
- Use validated scales that align with learning content
- Use systems approaches to strengthen organizational climate and improve hidden curriculum over time

The present study uses theory explicitly; uses one strong, validated scale and two other less robust scales that have limited psychometric testing; focuses on systems-level implementation; and moves beyond awareness to self-reported clinical preparedness,

attitudes, beliefs, and behaviors. Other recommendations summarized above were considered in determining recommendations for GW health curricula going forward.

CHAPTER 3: METHODS

Overview of Methodology

Purpose of Study

This Qual(quan) concurrent design mixed methods study triangulated quantitative and qualitative data to provide recommendations for SGM health curricular change at the GW School of Medicine and Health Sciences (SMHS). The qualitative strand consisted of primary data collection from interviews with curricular champions at any institution that has published work on SGM curricular interventions in the last five years or was referred by a published intervention author. The quantitative strand was an exploratory, retrospective secondary analysis. An exploratory approach was warranted given the limited research done to date regarding health care professional and graduate health professional student knowledge, attitudes, preparedness, beliefs, and behaviors toward SGM individuals.

Research Questions

RQ1: What Reduced Models explain a meaningful amount (≥0.15) of total variance among health professional student self-reported knowledge, attitudes, clinical preparedness, beliefs, and behaviors regarding SGM patient health and health care?

RQ2: What lessons have champions at other institutions learned about implementing SGM curricular change?

RQ3: How can implementation lessons from other institutions be used to improve GW health professional student preparedness in caring for SGM?

Hypotheses

For RQ1, the hypothesis is: In a sample of health professional students at an urban academic center, at least one Reduced Model comprised of fewer than eight predictor variables would explain a meaningful amount of total variance for each outcome variable ($R^2 \geq .15$), using multiple linear regression. Outcome variables are: knowledge, attitudes (two scales), clinical preparedness, beliefs and behaviors regarding SGM health and health care. (See Figure 5 for Full and Reduced Models).

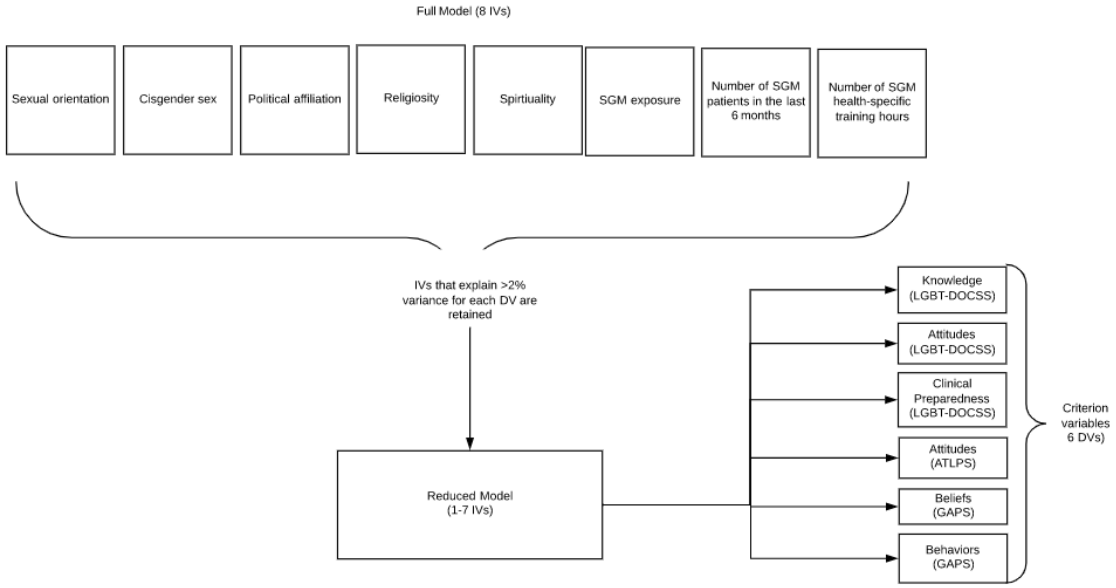

Figure 5. Full and Reduced Models

RQ2 and RQ3 were naturalistic, and thus not hypothesis-driven.

Research Design

Justification for a Mixed Methods Approach

This Qual(quan) mixed methods study leveraged insights of faculty who championed SGM curricular change at other institutions to identify strategies to address

measured gaps in GW health professional student preparedness to care for future SGM patients. Mixing occurred in the data analysis and reporting phases.

To test the impact of a learning intervention at GW, respondent self-reported data on knowledge, attitudes, clinical preparedness, beliefs, and behaviors were measured using three scales: the LGBT-DOCSS (Bidell, 2017), the ATLPS (Wilson et al., 2014), and the GAPS (Crisp, 2006). The secondary analysis performed in the present study explored models that could potentially explain meaningful total variance in graduate health professional student knowledge, attitudes, clinical preparedness, beliefs, and behaviors. A reduction approach was used, starting with a multiple regression using eight potential variables and reducing models based on independent variables that explained >2% variance in the sample for each criterion variable. Sexual orientation, sex, political affiliation, religiosity, spirituality, personal exposure to SGM people, number of SGM-related training hours, and number of SGM-related clinical encounters in the prior six months were the eight independent variables included for each criterion variable's Full Model. Multiple regression was appropriate in order to interpret theory-driven independent variables in the context of key demographic variables (Kelley & Maxwell, 2010). Dependent variables that explained >2% variance for the criterion variable were included in a Reduced Model for each criterion variable.

Implementation of successful curricular change is complex and varies based on organizational context. Qualitative data from investigators who have introduced curricular change focused on improving medical and nursing student readiness to care for SGM were used to identify critical implementation factors for consideration when

championing change. Interview questions were guided by the CFIR (Damschroder et al., 2009; CFIR, 2019).

Quantitative and qualitative data were mixed to inform strategic recommendations to improve the GW medical school curriculum going forward. While each organizational context is unique, information gained from investigators across multiple institutions regarding curricular change implementation can assist others seeking to improve SGM content at diverse health professional schools.

Site Selection

GW was selected as the site for research for three primary reasons. First, a documented curriculum gap exists (Abon & Pratt-Chapman, 2018a; Abon & Pratt-Chapman, 2018b; Pratt-Chapman & Abon, 2019). Second, Washington, DC area is home to the highest SGM population in the nation; therefore, training medical students coming out of a Washington, DC-based medical school to better serve the 10.8% of the population of the nation's capital is appropriate and critically needed (Williams Institute, 2016). Third, a primary data set was available on which to conduct the secondary analysis (see Appendix A).

For RQ2, investigators with the following eligibility criteria were invited to interview: 1) Was an author on an SGM curricular intervention that evaluated outcomes that was published in the last five years; and/or 2) Was referred by a published author for SGM curricular expertise. Based on these criteria, four studies from the literature review were not eligible (Grubb et al., 2013; Carabez et al., 2015 Rowniak & Selix, 2016; Solotke et al., 2017), leaving 21 academic settings as potential sites from which to select investigators for interviews for inclusion criterion one (see Appendix C).

Feasibility

The present study was feasible because secondary data was available to analyze for RQ1. The primary data set included self-report data from health professional students, faculty, staff, and alumni for the LGBT-DOCSS, ATLPS, and GAPS along with unanalyzed sociodemographic variables and learning exposures (e.g. SGM-related hours, SGM patients encountered in the prior 6 months). For RQ2, contact information was publicly available for authors who had published an SGM-related curricular intervention in the last five years.

Data from RQ1 and RQ2 were used to craft recommendations to optimize success for curricular change at GW (RQ3).

Alignment of Research Goals, Theory, and Methods

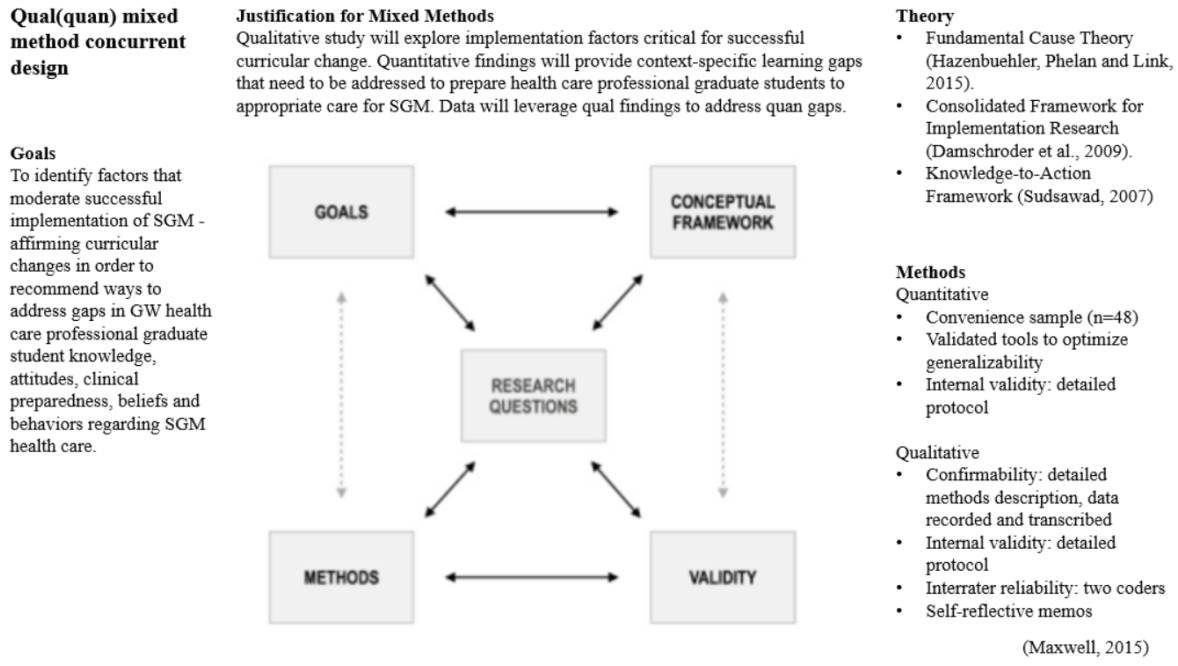

Figure 6. Alignment of research approach

Quantitative Strand

Participants and Procedures

Sample. The sample was a subset of a primary data set (n=167) of medical, nursing, allied health, psychology and public health students, faculty, staff, and alumni previously surveyed for another purpose from October-December 2018 (Pratt-Chapman & Phillips, 2019). The intervention group (n=33) for the primary study was a convenience sample that opted into the learning intervention and were eligible to participate if they were a health professional student, staff, or faculty member at GW. The control group for the primary study did not participate in the learning intervention (n=134). The primary study examined within-group pre- and post-session differences for the intervention group as well as between-group differences comparing post-session intervention group mean scores and non-intervention group mean scores across three scales (LGBT-DOCSS, ATLPS, GAPS) (Pratt-Chapman & Phillips, 2019).

Participants were recruited into the primary study through two methods: 1) An invitation to complete a pre-session survey and a post-session survey after a day-long SGM learning intervention, or 2) an invitation to complete an online survey via an email with an embedded link to a secure database (e.g. RedCap) following the symposium. Recruitment to the symposium and recruitment of the control group were both conducted via emails to all medical students via student listservs and via word of mouth and smaller distribution lists for other health care professional students. The first one hundred student respondents to complete a survey received a $15 Amazon gift card (Pratt-Chapman & Phillips, 2019).

Creation of secondary data set for analysis. The secondary analysis sample was created by removing the intervention group (n=33), as well as staff, faculty, undergraduate students, postdocs, and those who indicated they were "other" (e.g. alumni of the university, etc.) in the control group through listwise deletion, leaving only graduate health professional students in the control group (n=116) (see Figure 7). The intervention group was eliminated, because the learning intervention may have inflated social desirability bias in both pre-test and posttest scores, and the post-test questions for the GAP-behavior subscale measured intention to behave rather than actual behaviors for the posttest. Staff, faculty, undergraduate students, postdocs, and those who indicated they were "other" were eliminated, because their responses were not relevant to the secondary study's research question (focused on health professional graduate students). One additional respondent was dropped from the analysis as the only genderqueer respondent, leaving a total secondary sample of n=115. The genderqueer respondent was dropped, because no subgroup analyses could be run comparing cisgender respondents to the genderqueer group of n=1. Finally, individuals who did not answer all eight independent variables required for the Full Model were deleted listwise. Data were not imputed due to the personal nature of the independent variables. For example, sex, sexual orientation, religiosity, spirituality, and political affiliation were not calculated variables, but characteristic of the respondent by nature.

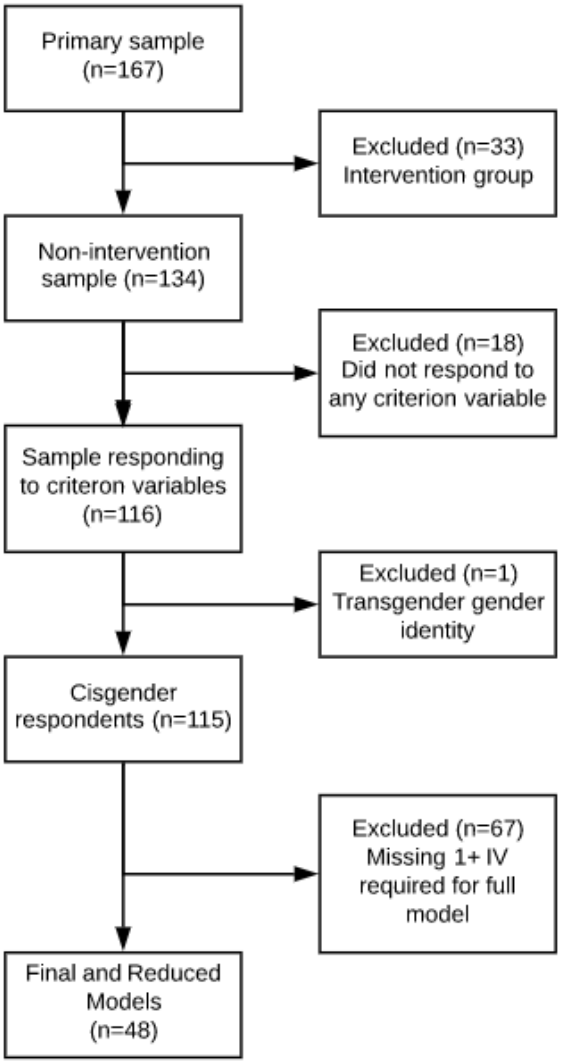

Figure 7. Sample for secondary analysis

Participant characteristics for the sample in this study are shown in Table 2. The first column describes characteristics of the sample from the primary study from which the data was drawn. The second column describes characteristics of the graduate health professional sample. This sample was used in the primary data analysis to evaluate the impact of a learning intervention on an interprofessional group of student learners. The third column represents the sample for this secondary analysis. Race was not especially diverse in the secondary analysis sample, with white respondents representing

approximately 65% of the sample and Asian respondents representing another 27%. One third of the sample was male and two-thirds were female. One third of the sample identified as a sexual minority (lesbian, bisexual, gay) and two-thirds of the sample identified as straight. Approximately 88% of the sample reported identifying as SGM or having a friend or family member who was SGM. Just under 90% of participants reported being mostly liberal or very liberal. Overall, the sample was more spiritual than religious and represented a variety of religions.

Table 2.

Study Participant Characteristics

Variable	Primary sample n (%) (Total n=167)	Graduate health professional students sample n (%) (Total n=115)	Secondary analysis sample n (%) (Total n=48)
Role			
Staff	12 (7.2)	Excluded	Excluded
Undergraduate student	9 (5.4)	Excluded	Excluded
Medical student (preclinical)	42 (25.1)	39 (33.9)	7 (14.6)
Medical student (clinical)	33 (19.8)	32 (27.8)	25 (52.1)
Other health graduate student	57 (34.1)	44 (38.3)	16 (33.3)
Postdoc	1 (.6)	Excluded	Excluded
Faculty	4 (2.4)	Excluded	Excluded
Other	8 (4.8)	Excluded	Excluded
System missing	1 (.6)	Excluded	Excluded
Sees patients			
Yes	71 (37.7)	65 (56.5)	48 (100%)
No	63 (42.5)	50 (43.5)	0 (0%)
System missing	33 (19.8)		
Age: M (SD)	26 (4.0)	26 (4.0)	26 (4.1)
Race+			
Asian	37 (22.2)	24 (20.9)	13 (27.1)
Black	9 (5.4)	3 (2.6)	1 (2.1)
Hispanic	11 (6.6)	9 (7.8)	4 (8.3)
White	81 (48.5)	56 (48.7)	31 (64.6)

Other	4 (2.4)	1 (.9)	1 (2.1)
System missing or Refused	34 (20.3)	30 (26.0)	1 (2.1)
Sex			
Female	103 (61.7)	64 (55.7)	33 (68.8)
Male	32 (19.2)	24 (20.9s)	15 (31.3)
System missing	32 (19.2)	27 (23.5)	0 (0)
Gender identity			
Female	101 (60.5)	64 (55.7)	33 (68.8)
Male	30 (18.0)	24 (20.9)	15 (31.3)
Transgender/ Genderqueer	2 (1.2)	Excluded	0 (0)
System missing or Refused	34 (20.4)	27 (23.5)	0 (0)
Sexual orientation			
Straight	94 (56.3)	62 (53.9)	32 (66.7)
Bisexual	14 (8.4)	10 (8.7)	6 (12.5)
Lesbian or gay	18 (10.8)	11 (9.6)	8 (16.7)
Other (e.g. asexual, queer, pansexual)	7 (4.2)	4 (3.5)	2 (4.2)
Missing or Refused	34 (20.4)	28 (24.3)	0 (0)
SGM affiliation			
Self-identify as SGM	38 (22.8)	23 (20.0)	14 (29.2)
Family member who is SGM	22 (13.2)	12 (10.4)	6 (12.5)
Friend who is SGM	64 (38.3)	44 (38.3)	22 (45.8)
Acquaintance who is SGM	9 (5.4)	8 (7.0)	6 (12.5)
Do not know anyone SGM	2 (1.2)	1 (.9)	0 (0)
System missing or Refused	34 (20.4)	27 (23.5)	0 (0)
Political affiliation			
Very liberal	57 (34.1)	35 (30.4)	21 (43.8)
Liberal	55 (32.9)	37 (32.2)	22 (45.8)
Neither liberal or conservative	6 (3.6)	2 (1.7)	0 (0)
Somewhat conservative	11 (6.6)	9 (7.8)	4 (8.3)
Very conservative	3 (1.8)	2 (1.7)	1 (2.1)
Apolitical	3(1.8)	3 (2.6)	0 (0)
System missing	32 (19.2)	27 (23.5)	0 (0)
Religion			
Agnostic	18 (10.8)	15 (13.0)	11 (22.9)
Atheist	19 (11.4)	11 (9.6)	5 (10.4)
Christian: Catholic	22 (13.2)	16 (13.9)	11 (22.9)
Christian: Protestant	23 (13.8)	14 (12.2)	8 (16.7)
Hindu	7 (4.2)	4 (3.5)	3 (6.3)
Jewish	15 (9.0)	11 (9.6)	6 (12.5)
Muslim	2 (1.2)	1 (.9)	1 (2.1)

Other	14 (8.3)	6 (5.2)	5 (12.5)
Prefer not to answer	13 (7.8)	10 (8.7)	1 (2.1)
System missing	47 (28.2)	27 (23.5)	5 (10.4)
Spirituality			
Not at all spiritual	26 (15.6)	16 (13.9)	6 (12.5)
Slightly spiritual	40 (24.0)	25 (21.7)	15 (31.3)
Somewhat spiritual	50 (29.9)	36 (31.3)	20 (41.7)
Very spiritual	18 (10.8)	10 (8.7)	7 (14.6)
System missing	33 (19.8)	28 (24.3)	0 (0)
Religiosity			
Not at all religious	50 (29.9)	32 (27.8)	16 (33.3.)
Slightly religious	38 (22.8)	25 (21.7)	16 (33.3)
Somewhat religious	40 (24.0)	26 (22.6)	12 (25.0)
Very religious	6 (3.6)	4 (3.5)	4 (8.3)
System missing	33 (19.8)	28 (24.3)	0 (0)

+Categories were not mutually exclusive

Missing data. Missing data were examined. Survey attrition lowered the sample size for the ATLPS, the GAP-Belief subscale, and the GAP-Behavior subscale. Missing data for those who answered each criterion variable, however, was less than 5%. In other words, there was attrition, presumably due to survey length, but there was not a high degree of missing data for those who made it sufficiently far in the online survey to respond to a particular scale. Based on Cheema (2014), this was a low amount of missing data and can be dealt with in numerous ways, including multiple imputation techniques or leaving the data as missing. For this secondary analysis, data was left as missing. Missing data for independent variables was more problematic, limiting the available sample that could be used in model comparisons (n=48). As described above, data were not imputed due to the personal nature of sex, sexual orientation, religiosity, spirituality, and political affiliation—characteristics that are inherent to the nature of the respondent.

Power analysis. G*Power 3.1.8.2 (Faul, Erdfelder, Buchner, & Lang, 2009) was used to conduct posthoc power analyses for all models, individual predictor variables within models, and model comparisons. *F* tests were used to determine power based on a multiple regression conducted on the limited sample for each model with effect size set to medium (f^2=.15) and α=.05. Models were tested using the "Fixed model: R2 deviation from zero" option in G*Power. For all individual predictors, two-tailed *t*-tests were conducted for multiple regression assuming a fixed model and single regression coefficient with (f^2=.03-05) and α=.05.

Based on the posthoc power analyses, the secondary sample was underpowered ($1-\beta$<.80) for most models to explain a medium effect (f^2=.13) for α=.05 and for most individual predictors to detect a small effect (f^2=.02) for α=.05 (Cohen, 1988; Weiss, 2011). After Reduced Models were created that included only independent variables that explained >2% unique variance on each criterion variable, power ranged from $(1-\beta)$=.36-.75 with all Reduced Models powered at $(1-\beta)\geq.50$. Because the sample was underpowered, variance in the criterion variable explained by individual predictors and for each model were examined rather than statistical significance. A threshold of variance explained >2% was selected to represent a small amount of unique variance explained (Cohen, 1988).

Table 3.

Power Analysis for Exploratory Models (G*Power 3.1.8.2, Dusseldorf, Germany), α=.05

Criterion variable	N	K	Power
LGBT-DOCSS: Knowledge	115		
Full Model: 8 IVs (f^2=.15)	48	8	.36

Individual predictors (f^2=.03-.05)	48	1	.32-.45
Reduced Model: 3 IVs (f^2=.15)	48	3	.56
Individual predictors (f^2=.03-.05)	48	1	.32-.45
Individual predictors (f^2=.03-.05)	48	1	.32-.45
LGBT-DOCSS: Attitudes	115		
Full Model: 8 IVs (f^2=.15)	48	8	.36
Individual predictors (f^2=.03-.05)	48	1	.32-.45
Reduced Model: 1 IV (f^2=.15)	48	1	.75
Individual predictors (f^2=.03-.05)	48	1	.32-.45
LGBT-DOCSS: Clinical preparedness	115		
Full Model: 8 IVs (f^2=.15)	48	8	.36
Individual predictors (f^2=.03-.05)	48	1	.32-.45
Reduced Model: 3 IVs (f^2=.15)	48	3	.56
Individual predictors (f^2=.03-.05)	48	1	.32-.45
ATLPS (Attitudes)	106		
Full Model: 8 IVs (f^2=.15)	48	8	.36
Individual predictors (f^2=.03-.05)	48	1	.32-.45
Reduced Model: 4 IVs (f^2=.15)	48	4	.50
Individual predictors (f^2=.03-.05)	48	1	.32-.45
GAPS: Belief	98		
Full Model: 8 IVs (f^2=.15)	48	8	.36
Individual predictors (f^2=.03-.05)	48	1	.32-.45
Reduced Model: 2 IVs (f^2=.15)	48	2	.50
Individual predictors (f^2=.03-.05)	48	1	.32-.45
GAPS: Behavior	53		
Full Model: 8 IVs (f^2=.15)	48	8	.36
Individual predictors (f^2=.03-.05)	48	1	.32-.45
Reduced Model: 4 IVs (f^2=.15)	48	4	.50
Individual predictors (f^2=.03-.05)	48	1	.32-.45

Measures and Variables

Criterion variables. Given the paucity of tools examining perceptions of SGM in the literature, instrumentation was limited in the literature. Most instruments in the literature have been constructed for a specific educational intervention and have not been validated. Three instruments that appeared to have the strongest psychometric properties were selected for this study. One of the scales selected (the LGBT-DOCSS) had three subscales: knowledge, attitudes, and clinical preparedness (Bidell, 2017). Another scale was a one-factor attitudes scale (ATLPS, Wilson et al., 2014). The final scale had two subscales: beliefs and behaviors (Crisp, 2006). See Instrumentation section below for details.

Instrumentation. The online survey asked a total of 144 questions (see Appendix A). Questions about respondent characteristics were followed by non-validated confidence items intended for analysis in the primary study, LGBT-DOCSS items, test items for correlation analyses with the LGBT-DOCSS, ATLPS items, test items for correlation analyses with the ATLPS, GAPS items, shared learning items, and additional demographic items, respectively.

For the secondary analysis, 72 items were included in the analysis, including 13 demographic and experience questions and three validated scales of varying length. Six questions about SGM-related training hours were summed to create one continuous independent variable (total SGM-related training hours). Six of the remaining seven independent variables were re-coded as dichotomous variables, and the one remaining independent variable was left as is (continuous variable for number of SGM-patients seen in the last six months).

LGBT-DOCSS. The LGBT-DOCSS was developed to measure self-reported knowledge, attitudes, and confidence in providing care for SGM across interdisciplinary health care professionals (Bidell, 2017). The LGBT-DOCSS has been tested for factor structure, reliability, and validity (Bidell, 2017). Exploratory and confirmatory factor analysis (n=602) detected an 18-item, three-factor structure, including knowledge, attitudes, and clinical preparedness. Internal consistency was satisfactory for the overall scale (α=.86) and for each subscale (clinical preparedness, α=.88; attitudes, α=.80; and knowledge, α=.87). Test-retest reliability was also strong (*r*=.87 for the overall scale, *r*=.88 for clinical preparedness, *r*=.85 for attitudes, and *r*=.86 for knowledge). To establish construct validity, a hypothesis was tested and subscales of the LGBT-DOCSS were compared to other established scales. It was hypothesized that SGM respondents would have higher LGBT-DOCSS scores than straight counterparts. This hypothesis was supported through one-way ANOVA testing showing statistically significant differences between groups (Bidell, 2017). Overall, psychometric testing on the LGBT-DOCSS demonstrates strong internal validity. Given the purpose of the present study, the LGBT-DOCSS was the most psychometrically sound instrument found in the extant literature.

The LGBT-DOCSS was published as an 18-item scale with items 3, 4, 5, 7, 9, 12, 17, and 18 reverse coded (See Appendix A). In the original instrument, respondents rated their agreement with each item on a 7-point scale with Strongly disagree=1, Somewhat Agree/Disagree=4, and Strongly agree=7 from left to right for a total score ranging from 18-126 for the overall scale, 7-49 for clinical preparedness, 7-49 for attitudes, and 4-28 for knowledge. Total scores for the full scale and each subscale are intended to be tallied and then divided by the total number of items in each scale to obtain a mean score.

Higher scores reflect greater self-reported clinical preparedness, more SGM-affirming attitudes, and greater knowledge of SGM health.

For the primary study from which data for this secondary analysis was accessed, the LGBT-DOCSS was altered in four ways: First, the scale was reduced from a 7-point scale to a 5-point scale. Second, the visual display was reversed, but the greater values were retained for "strongly agree" and the lesser value for "strongly disagree." Both changes were made to ensure cognitive consistency for respondents—i.e., the changes allowed respondents to keep the same Likert scale direction for each of the three instruments on the questionnaire. Third, the middle answer option was moved to the far right to distinguish it as "Not sure" rather than neutral. This method was recommended by Dillman (2000) to provide a more authentic non-response option while retaining reasonable estimates of respondent attitudes (Schim, Doorenbox, Miller, & Benkert, 2003). Finally, one item in the factor analysis of the LGBT-DOCSS manuscript was different from the final instrument published as an appendix to the same manuscript (Bidell, 2017). Both items were included in the survey; however, only the appropriate item was used in the analysis (Bidell, personal correspondence, October 5, 2018). The total possible score for the LGBT-DOCSS ranged from 18-90 with subscales detailed below.

LGBT-DOCSS Knowledge. This subscale includes items 1, 2, 6 and 8 of the LGBT-DOCSS. Items were scored for a continuous composite score with a range of 4-20. Low scores indicate less and higher scores indicate more self-reported knowledge. Mean and standard deviation, correlation with independent variables, and model fit are reported below in Tables 4 and 5.

Table 4.
Correlations Table for LGBT-DOCSS Knowledge

	Variable	1	2	3	4	5	6	7	8	9
	LGBT-DOCSS:									
1	Knowledge	1.000								
2	Sexual orientation	-0.052	1.000							
3	Cisgender sex	0.069	-0.381	1.000						
4	Political affiliation	-0.185	0.096	0.064	1.000					
5	Religiosity	-0.298	0.219	-0.191	0.193	1.000				
6	Spirituality	-0.065	0.000	-0.130	0.163	0.445	1.000			
7	SGM affiliation	-0.249	0.267	0.153	0.284	0.000	-0.175	1.000		
8	Number of patients	-0.072	0.078	-0.141	-0.078	0.086	0.043	-0.215	1.000	
9	Number of SGM training hours	0.098	-0.049	-0.061	-0.011	0.036	0.148	-0.228	0.538	1.000
	Mean	17.833							19.188	32.125
	SD	2.300							22.785	34.950

Cronbach's alpha=0.05, n=48

Table 5.
Model Comparisons: LGBT-DOCSS Knowledge (n=48)

	Individual Predictors						Model Statistics					
LGBT-DOCSS Knowledge	b	SE b	B	*t*	*p*	sr^2	R	R^2	dfreg	dfres	*F*	*p*
Full Model : 8 IV's							0.451	0.204	8	39	1.247	0.299
Sexual orientation (0=LGB, 1=Straight)	0.791	0.817	0.164	0.968	0.339	0.019						
Sex (0=F, 1=M)	0.539	0.801	0.110	0.673	0.505	0.009						
Political affiliation (0=Liberal, 1=Not liberal)	-0.658	1.152	-0.088	-0.571	0.571	0.007						
Religiosity (0=Not religious, 1=Religious)	-1.441	0.806	-0.298	-1.788	0.082	0.065∞						
Spirituality (0=Not spiritual, 1=Spiritual)	0.147	0.766	0.032	0.192	0.849	0.001						
SGM affiliation (0=SGM affiliation, 1=No affiliation)	-1.965	1.154	-0.285	-1.703	0.097	0.059∞						
Number of patients (continuous)	-0.020	0.018	-0.201	-1.150	0.257	0.027∞						
Number of SGM training hours (continuous)	0.011	0.011	0.161	-1.150	0.359	0.018						
Reduced Model : 3 IV's							0.402	0.161	3	44	2.822	0.050*
Religiosity (0=Not religious, 1=Religious)	-1.393	0.669	-0.289	-2.082	0.043*	0.083∞						
SGM affiliation (0=SGM affiliation, 1=No affiliation)	-1.872	0.973	-0.272	-1.923	0.061	0.071∞						
Number of patients (continuous)	-0.011	0.014	-0.106	-0.748	0.458	0.011						

* indicates $p<.05$; ∞ indicates >2% unique variance explained

LGBT-DOCSS Attitudes. This subscale includes items 3, 5, 7, 9, 12, 17, and 18 of the LGBT-DOCSS. All items were reverse coded and summed for a total possible score of 7-35 for attitudes. Higher scores represent more affirming attitudes toward SGM. When conducting validity testing, bivariate correlations supported hypotheses of correlations between established scales (Bidell, 2017). The attitudes subscale of the LGBT-DOCSS correlated with the Genderism and Transphobia Scale-Revised Short Form (GTS-R-SF; Tebbe, Moradi, & Ege, 2014) (r=-.84, p<.001), and the Right-Wing Authoritarian-Short scale (Rattazzi, Bobbio, & Canova, 2007; r=.62, p<.001), and the Lesbian, Gay, and Bisexual-Affirmative Counseling Self-Efficacy Inventory, r=.12, p<.05 (LGB-CSI; Dillon & Worthington, 2003; Bidell, 2017). Mean and standard deviation, correlation with independent variables, and model fit are reported below in Tables 6 and 7.

***LGBT-DOCSS Clinical preparedness*.** The clinical preparedness subscale of the LGBT-DOCSS includes items 4 (reverse coded), 10, 11, 13, 14, 15, and 16 with a possible composite score of 7-35. High scores represent greater self-reported clinical preparedness. During validity testing, the clinical preparedness subscale correlated with the LGB-CSI (r=.69, p<.001) (Dillon & Worthington, 2003; Bidell, 2017). Mean and standard deviation, correlation with independent variables, and model fit are reported below in Tables 8 and 9.

ATLPS. The ATLPS is an 11-item scale measuring attitudes toward SGM, including comfort with SGM patient encounters, attitudes and opinions of SGM people, and beliefs about professional role. Responses are measured on a five-point Likert scale from strongly disagree (1) to strongly agree (5) for a total score of 11-55 with higher

Table 6.
Correlations Table for LGBT-DOCSS Attitudes

	Variable	1	2	3	4	5	6	7	8	9
	LGBT-DOCSS:									
1	Attitudes	1.000								
2	Sexual orientation	-0.182	1.000							
3	Cisgender sex	0.002	-0.381	1.000						
4	Political affiliation	-0.682	0.096	0.064	1.000					
5	Religiosity	-0.208	0.219	-0.191	0.193	1.000				
6	Spirituality	-0.157	0.000	-0.130	0.163	0.445	1.000			
7	SGM affiliation	-0.224	0.267	0.153	0.284	0.000	-0.175	1.000		
8	Number of patients	-0.126	0.078	-0.141	-0.078	0.086	0.043	-0.215	1.000	
9	Number of SGM training hours	-0.170	-0.049	-0.061	-0.011	0.036	0.148	-0.228	0.538	1.000
	Mean	32.188								
	SD	5.147								

Cronbach's alpha=0.05, n=48

Table 7.
Model Comparisons: LGBT-DOCSS Attitudes (n=48)

	Individual Predictors						Model Statistics					
LGBT-DOCSS: Attitudes	b	SE b	B	*t*	*p*	sr^2	R	R^2	dfreg	dfres	*F*	*p*
Full Model : 8 IV's							0.725	0.526	8	39	5.404	<0.001**
Sexual orientation (0=LGB, 1=Straight)	-1.043	1.411	-0.097	-0.739	0.464	0.007						
Sex (0=F, 1=M)	-0.187	1.383	-0.017	-0.135	0.893	0.000						
Political affiliation (0=Liberal, 1=Not liberal)	-10.845	1.990	-0.650	-5.450	<0.001**	0.361∞						
Religiosity (0=Not religious, 1=Religious)	-0.437	1.392	-0.040	-0.314	0.755	0.001						
Spirituality (0=Not spiritual, 1=Spiritual)	-0.233	1.322	-0.023	-0.176	0.861	<0.001						
SGM affiliation (0=SGM affiliation, 1=No affiliation)	-1.076	1.993	-0.070	-0.540	0.592	0.004						
Number of patients (continuous)	-0.025	0.030	-0.110	-0.814	0.421	0.008						
Number of SGM training hours (continuous)	-0.020	0.020	-0.136	-1.012	0.318	0.012						
Reduced Model : 1 IV							0.682	0.465	1	46	40.007	<0.001**
Political affiliation (0=Liberal, 1=Not liberal)	-11.372	1.798	-0.682	-6.325	<0.001**	0.465∞						

* indicates $p<.05$; ** indicates $p<.001$; ∞ indicates >2% unique variance explained

Table 8.
Correlations Table for LGBT-DOCSS Clinical Preparedness

	Variable	1	2	3	4	5	6	7	8	9
	LGBT-DOCSS:									
1	Clinical Preparedness	1.000								
2	Sexual orientation	-0.064	1.000							
3	Cisgender sex	-0.073	-0.381	1.000						
4	Political affiliation	-0.110	0.096	0.064	1.000					
5	Religiosity	-0.128	0.219	-0.191	0.193	1.000				
6	Spirituality	0.126	0.000	-0.130	0.163	0.445	1.000			
7	SGM affiliation	-0.157	0.267	0.153	0.284	0.000	-0.175	1.000		
8	Number of patients	0.093	0.078	-0.141	-0.078	0.086	0.043	-0.215	1.000	
9	Number of SGM training hours	0.246	-0.049	-0.061	-0.011	0.036	0.148	-0.228	0.538	1.000
	Mean	24.708								
	SD	5.363								

Cronbach's alpha=0.05, n=48

Table 9.
Model Comparisons: LGBT-DOCSS Clinical Preparedness (n=48)

	Individual Predictors						Model Statistics					
	b	SE b	B	*t*	*p*	sr^2	R	R^2	dfreg	dfres	*F*	*p*
Full Model : 8 IV's							0.354	0.125	8	39	0.698	0.691
Sexual orientation (0=LGB, 1=Straight)	-0.122	1.996	-0.011	-0.061	0.952	0.000						
Sex (0=F, 1=M)	-0.845	1.956	-0.074	-0.432	0.668	0.004						
Political affiliation (0=Liberal, 1=Not liberal)	-1.424	2.816	-0.082	-0.506	0.616	0.006						
Religiosity (0=Not religious, 1=Religious)	-2.351	1.970	-0.209	-1.194	0.240	0.032∞						
Spirituality (0=Not spiritual, 1=Spiritual)	1.944	1.871	0.182	1.039	0.305	0.024∞						
SGM affiliation (0=SGM affiliation, 1=No affiliation)	-0.719	2.820	-0.045	-0.255	0.800	0.001						
Number of patients (continuous)	-0.012	0.043	-0.050	-0.274	0.785	0.002						
Number of SGM training hours (continuous)	0.036	0.028	0.237	1.303	0.200	0.038∞						
Reduced Model : 3 IV's							0.328	0.108	3	44	1.768	0.167
Religiosity (0=Not religious, 1=Religious)	-2.486	1.792	-0.221	-1.388	0.172	0.039∞						
Spirituality (0=Not spiritual, 1=Spiritual)	2.040	1.720	0.191	1.186	0.242	0.029∞						
Number of SGM training hours (continuous)	0.035	0.022	0.226	1.566	0.125	0.050∞						

* indicates $p<.05$; ∞ indicates >2% unique variance explained

scores reflecting more affirming SGM attitudes. Items 2, 3, 5, 7, 8, and 9 were reverse coded. For the primary data from which this analysis drew, the rating scale was identical to the published instrument, but the directionality was reversed to ensure consistency of strongly agree to strongly disagree from left to right for the respondent. In addition, the neutral answer option was changed to "no opinion" and shifted to the far right to provide a clear non-response option (Dillman, 2000) for cognitive consistency across all scales.

The ATLPS (Wilson et al., 2014) was adapted from a prior scale of the same name originally created to assess differences in medical student attitudes about gay and lesbian patients (Sanchez et al., 2006). Wilson et al. (2014) made the scale more inclusive by changing "gay and lesbian" or "homosexual" to "LGBT" for three measures, by changing the word "physician" to "healthcare professionals" in another item, and by consolidating four items to two while simplifying language to be more accessible. Sanchez et al.'s (2006) original scale adapted items from a validated survey about physician attitudes toward patients with AIDS (Yedidia, Berry, & Barr, 1996). Validity of Sanchez's (2006) ATLPS has not been reported, but Wilson et al. (2014) found strong internal reliability of items when used as a single factor scale (α=.84). During the primary study data analysis, face validity of two items was determined to be highly questionable (Sotomayor, Pratt-Chapman, & Phillips, 2019). Therefore, while this scale was included in the analysis and was chosen in order to compare outcomes with other published studies, findings should be interpreted with caution. See Chapter 5 for a more detailed discussion. Mean and standard deviation, correlation with independent variables, and model fit are reported below in Tables 10 and 11.

Table 10.
Correlations Table for ATLPS Attitudes

	Variable	1	2	3	4	5	6	7	8	9
1	ATLPS: Attitudes	1.000								
2	Sexual orientation	-0.361	1.000							
3	Cisgender sex	-0.175	-0.381	1.000						
4	Political affiliation	-0.273	0.096	0.064	1.000					
5	Religiosity	-0.287	0.219	-0.191	0.193	1.000				
6	Spirituality	-0.148	0.000	-0.130	0.163	0.445	1.000			
7	SGM affiliation	-0.333	0.267	0.153	0.284	0.000	-0.175	1.000		
8	Number of patients	-0.088	0.078	-0.141	-0.078	0.086	0.043	-0.215	1.000	
9	Number of SGM training hours	-0.050	-0.049	-0.061	-0.011	0.036	0.148	-0.228	0.538	1.000
	Mean	43.854								
	SD	4.613								

Cronbach's alpha=0.05, n=48

Table 11.
Model Comparisons: ATLPS-Attitudes (n=48)

	Individual Predictors						Model Statistics					
	b	SE b	B	*t*	*p*	sr^2	R	R^2	dfreg	dfres	*F*	*p*
Full Model : 8 IV's							0.618	0.381	8	39	3.005	0.010*
Sexual orientation (0=LGB, 1=Straight)	-3.733	1.444	-0.386	-2.586	0.014*	0.106∞						
Sex (0=F, 1=M)	-3.486	1.415	-0.354	-2.463	0.018*	0.096∞						
Political affiliation (0=Liberal, 1=Not liberal)	-1.653	2.037	-0.111	-0.812	0.422	0.010						
Religiosity (0=Not religious, 1=Religious)	-1.804	1.425	-0.186	-1.266	0.213	0.025∞						
Spirituality (0=Not spiritual, 1=Spiritual)	-1.059	1.353	-0.115	-0.783	0.439	0.010						
SGM affiliation (0=SGM affiliation, 1=No affiliation)	-2.768	2.040	-0.201	-1.357	0.183	0.029∞						
Number of patients (continuous)	-0.022	0.031	-0.110	-0.713	0.480	0.008						
Number of SGM training hours (continuous)	-0.007	0.020	-0.054	-0.356	0.724	0.002						
Reduced Model : 4 IV's							0.581	0.337	4	43	5.468	0.001*
Sexual orientation (0=LGB, 1=Straight)	-3.760	1.410	-0.388	-2.666	0.011*	0.110∞						
Sex (0=F, 1=M)	-3.425	1.388	-0.348	-2.468	0.018*	0.094∞						
Religiosity (0=Not religious, 1=Religious)	-2.601	1.241	-0.269	-2.095	0.042*	0.068∞						
SGM affiliation (0=SGM affiliation, 1=No affiliation)	-2.429	1.857	-0.176	-1.308	0.198	0.026∞						

* indicates $p<.05$; ∞ indicates >2% unique variance explained

GAPS. The GAPS is a 30-item scale designed to measure health practitioners' beliefs and behaviors regarding care of gay and lesbian individuals. The instrument uses a 5-point Likert scale from "Strongly agree" (5 points) to "Strongly disagree" (1 point) for items 1-15 and from "Always" to "Never" for items 16-30. The directionality and scoring for items were retained from the original instrument with the neutral answer option shifted to the far right to allow for a genuine non-response option as with the prior two scales (Dillman, 2000). Total score ranges are 15-75 for each subscale and 30-150 for the overall scale. Limited psychometric testing has been conducted for the GAPS, but items have reasonable face validity. In a sample of mental health professionals (n=488), the internal consistency was strong for both the belief (α=.93) and behavior (α=.95) domains. Fifteen items from each domain were retained for the final version overall (α=.95).

GAPS-Belief. The belief subscale includes the first 15 items of the GAPS. The range of possible scores for this study for each subscale is 15-75 with a higher score reflecting more affirming SGM beliefs. Construct validity was established by Crisp (2006) by examining Pearson's *r* correlations between the belief subscale and the Heterosexual Attitudes toward Homosexuals Scale (Larsen, Reed, & Hoffman, 1980) (r=.624, p<.001). Internal reliability for this subscale is strong (α=.93) (Crisp, 2006). Mean and standard deviation, correlation with independent variables, and model fit are reported below in Tables 12 and 13.

GAPS-Behavior. The Behavior subscale includes the last 15 items of the GAPS. The range of possible scores for this subscale is 15-75 with a higher score reflecting more affirming SGM clinical behaviors. Construct validity was established by Crisp (2006) by

Table 12.
Correlations Table for GAPS-Belief

	Variable	1	2	3	4	5	6	7	8	9
1	GAPS: Belief	1.000								
2	Sexual orientation	-0.219	1.000							
3	Cisgender sex	-0.101	-0.381	1.000						
4	Political affiliation	-0.605	0.096	0.064	1.000					
5	Religiosity	-0.188	0.219	-0.191	0.193	1.000				
6	Spirituality	-0.035	0.000	-0.130	0.163	0.445	1.000			
7	SGM affiliation	-0.495	0.267	0.153	0.284	0.000	-0.175	1.000		
8	Number of patients	0.085	0.078	-0.141	-0.078	0.086	0.043	-0.215	1.000	
9	Number of SGM training hours	0.055	-0.049	-0.061	-0.011	0.036	0.148	-0.228	0.538	1.000
	Mean	69.271								
	SD	7.668								

Cronbach's alpha=0.05, n=48

Table 13.
Model Comparisons: GAPS-Belief (n=48)

	Individual Predictors						Model Statistics					
GAPS-Belief	b	SE b	B	*t*	*p*	sr^2	R	R^2	dfreg	dfres	*F*	*p*
Full Model : 8 IV's							0.706	0.498	8	39	4.839	<0.001**
Sexual orientation (0=LGB, 1=Straight)	-1.514	2.161	-0.094	-0.700	0.488	0.006						
Sex (0=F, 1=M)	-1.204	2.118	-0.074	-0.568	0.573	0.004						
Political affiliation (0=Liberal, 1=Not liberal)	-12.058	3.049	-0.485	-3.954	<0.001**	0.201∞						
Religiosity (0=Not religious, 1=Religious)	-1.595	2.133	-0.099	-0.747	0.459	0.007						
Spirituality (0=Not spiritual, 1=Spiritual)	0.418	2.026	0.027	0.206	0.838	0.001						
SGM affiliation (0=SGM affiliation, 1=No affiliation)	-7.433	3.054	-0.324	-2.434	0.020*	0.076∞						
Number of patients (continuous)	<0.001	0.047	0.000	0.000	1.000	<0.001						
Number of SGM training hours (continuous)	-0.007	0.030	-0.034	-0.247	0.806	0.001						
Reduced Model : 2 IV's							0.693	0.480			20.786	<0.001**
Political affiliation (0=Liberal, 1=Not liberal)	-12.561	2.784	-0.506	-4.512	<0.001**	0.235∞						
SGM affiliation (0=SGM affiliation, 1=No affiliation)	-8.067	2.571	-0.352	-3.137	0.003*	0.114∞						

* indicates $p<.05$; ** indicates $p<.001$; ∞ indicates >2% unique variance explained

Table 14.
Correlations Table for GAPS-Behavior

	Variable	1	2	3	4	5	6	7	8	9
1	GAPS: Behavior	1.000								
2	Sexual orientation	-0.306	1.000							
3	Cisgender sex	-0.015	-0.381	1.000						
4	Political affiliation	-0.407	0.096	0.064	1.000					
5	Religiosity	-0.090	0.219	-0.191	0.193	1.000				
6	Spirituality	0.290	0.000	-0.130	0.163	0.445	1.000			
7	SGM affiliation	-0.425	0.267	0.153	0.284	0.000	-0.175	1.000		
8	Number of patients	0.242	0.078	-0.141	-0.078	0.086	0.043	-0.215	1.000	
9	Number of SGM training hours	0.442	-0.049	-0.061	-0.011	0.036	0.148	-0.228	0.538	1.000
	Mean	56.125								
	SD	11.953								

Cronbach's alpha=0.05, n=48

Table 15.
Model Comparisons: GAPS-Behavior (n=48)

	Individual Predictors						Model Statistics					
GAPS-Behavior	b	SE b	B	*t*	*p*	sr^2	R	R^2	dfreg	dfres	*F*	*p*
Full Model : 8 IV's							0.73	0.533	8	39	5.571	<0.001**
Sexual orientation (0=LGB, 1=Straight)	-4.789	3.249	-0.191	-1.474	0.149	0.026						
Sex (0=F, 1=M)	-0.106	3.185	-0.004	-0.033	0.974	0.000						
Political affiliation (0=Liberal, 1=Not liberal)	-14.587	4.584	-0.377	-3.182	0.003*	0.121∞						
Religiosity (0=Not religious, 1=Religious)	-3.534	3.207	-0.141	-1.102	0.277	0.015						
Spirituality (0=Not spiritual, 1=Spiritual)	8.096	3.046	0.34	2.658	0.011*	0.085∞						
SGM affiliation (0=SGM affiliation, 1=No affiliation)	-4.474	4.591	-0.125	-0.975	0.336	0.011						
Number of patients (continuous)	0.005	0.070	0.009	0.069	0.945	0.000						
Number of SGM training hours (continuous)	0.120	0.045	0.350	2.633	0.012*	0.083∞						
Reduced Model : 4 IV's							0.712	0.507			11.036	<0.001**
Sexual orientation (0=LGB, 1=Straight)	-6.180	2.704	-0.246	-2.286	0.027*	0.060∞						
Political affiliation (0=Liberal, 1=Not liberal)	-16.603	4.227	-0.429	-3.928	<0.001**	0.177∞						
Spirituality (0=Not spiritual, 1=Spiritual)	7.238	2.619	0.304	2.763	0.008*	0.088∞						
Number of SGM training hours (continuous)	0.130	0.037	0.381	3.510	0.001*	0.141∞						

* indicates $p<.05$; ∞ indicates >2% unique variance explained

examining Pearson's *r* correlations between the behavior subscale and the Attitudes toward Lesbians and Gay men scale short form (Herek, 1988) (r=.455, p<.001). Internal reliability for this subscale was determined to be (α=.94) (Crisp, 2006). Mean and standard deviation, correlation with independent variables, and model fit are reported below in Tables 14 and 15.

Independent Variables. The independent variables were selected based on the strongest predictors toward SGM knowledge, attitudes, and beliefs in the existing literature. An explanation of independent variables included and excluded are discussed below.

Sexual orientation. Sexual orientation has been shown to be a predictor of SGM attitudes with sexual minorities more likely to be less biased (Wilson et al., 2014; Green et al., 2018). However, SGM experience internalized homophobia and transphobia—so attitudes regarding SGM status may be complex. In Wilson et al.'s (2014) study, sexual orientation was less important than religiosity in predicting SGM attitudes; however, this may be a result of the smaller percentage of sexual minorities in the sample. It is hypothesized that those who identify as SGM will have more SGM affirming knowledge, attitudes, clinical preparedness, beliefs, and behaviors compared to straight counterparts. In the primary data set, respondents were given the option to choose one of the following categories: 1) straight, 2) bisexual, 3) lesbian or gay, 4) other sexual orientation, or 5) prefer not to answer. For the secondary analysis, variables were dichotomized to: 0=lesbian, gay, bisexual, other sexual orientation, 1=straight.

Sex and Gender identity. Numerous studies have demonstrated that cisgender men typically exhibit more anti-SGM attitudes than cisgender females (Thomas, Scott, &

Brooks, 1980; Chng & Moore, 1991; Green et al., 1993; Black et al., 1996; Morrison & Morrison, 2011; Norton & Herek, 2013; Beagan, Fredericks, & Goldberg, 2012; Banwari et al. 2015; Fisher et al., 2017; Green et al., 2018). Sex was captured as a categorical variable: Options were male, female, and intersex. In the primary data set, there were no respondents who reported intersex status. A dichotomous variable coded 0=male, 1=female in the secondary data set was created.

Gender identity was captured as a second categorical variable: Options for gender identity were: 1) Female, 2) Male, 3) Transgender, nonbinary gender or gender nonconforming, 4) Other gender identity, 5) Prefer not to answer. One respondent in the secondary sample indicated that they were genderqueer. This respondent was dropped from the data set to obtain a sex-gender identity concordant (i.e., cisgender) sample. In other words, by deleting this one case, the remaining sample was cisgender, so only sex (not gender identity) was used as an independent variable.

Political affiliation. Past research has shown conservative political affiliation to predict more anti-SGM bias than liberal political affiliation (Morrison & Morrison, 2011; Norton & Herek, 2013; Ali et al., 2015). Political affiliation was captured as a categorical variable in the primary data set as follows: 1) Very liberal, 2) Somewhat liberal, 3) Neither liberal nor conservative; 4) Somewhat conservative; 5) Very conservative; 6) Apolitical. For the secondary analysis, variables were dichotomized to: 0=very liberal or liberal, 1=neither liberal nor conservative, somewhat conservative, very conservative, apolitical. Groups were interpreted as “liberal” (0) or not liberal (1).

Religiosity. Past research has suggested that religiosity can be a predictor of anti-SGM bias (Cramer, 1997; Norton & Herek, 2013; Klotzbaugh & Spencer, 2014; Bidell,

2017) and that religiosity is a greater predictor than type of religion (Wilson et al., 2014). In the primary data set, respondents were given the following options: 1) Not at all religious, 2) Slightly religious, 3) Somewhat religious, 4) Very religious. For the secondary data sample, this variable was dichotomized to: 0=not at all or slightly religious, and 1= somewhat or very religious.

Spirituality. Past research has supported spirituality as a predictor of anti-SGM bias (Wilton et al., 2014). Spirituality was captured as a categorical variable: Options were 1) Not at all spiritual, 2) Slightly spiritual, 3) Somewhat spiritual, 4) Very spiritual. For the secondary data sample, this variable was dichotomized to: 0=not at all or slightly spiritual, and 1= somewhat or very spiritual.

SGM affiliation: Exposure to SGM people has been suggested as a moderator of bias (Phelan et al., 2017; Earnshaw et al., 2016; Tucker et al., 2016). In the primary data set, respondents were given the following options: 1) I consider myself part of the LGBTQI community, 2) I have a family member who identifies as LGBTQI, 3) I have a friend who identifies as LGBTQI, 4) I have an acquaintance who identifies as LGBTQI, and 5) I do not know anyone who identifies as LGBTQI. For the secondary data sample, this variable was dichotomized to: 0= considers self part of LGGBTQI community or has an LGBTQI family member or friend; 1= has an LGBTQI acquaintance or does not know anyone who identifies as LGBTQI. Note that this independent variable has some collinearity with sexual orientation, since self-reported SGM status was included as part of the SGM affiliation variable. Tolerance and VIF were checked for all models to ensure that collinearity did not apply in Reduced Models.

Number of hours of SGM-specific training. Amount of training on SGM health topics has been suggested as a potential moderator of SGM attitudes (Cramer, 1997; Bidell, 2013; Dowshen et al., 2013). In the primary study, participants were asked about number mandatory LGB health hours, transgender health hours, and intersex health hours, as well as elective LGB hours, transgender health hours, and intersex health hours. These six continuous variables were summed for one continuous variable for the secondary analysis as hours of SGM-related health training.

Number of SGM patient interactions. Degree of exposure to SGM has been suggested as a moderator of SGM attitudes (Bidell, 2017). In the primary study, respondents were asked how many SGM patients they had interactions with in the prior six months (continuous variable). If the respondent answered "no" to the question, "Do you see patients?," they did not receive the question about number of SGM patient interactions.

Relevant variables excluded. Variables that were excluded that have shown statistical significance in the literature are indicated below. Due to limitations on power, numerous potentially explanatory variables were excluded based on level of relevance to the present research question or lack of ability to meaningfully interpret findings due to heterogeneity of categories. Justification for exclusion is included in greater detail under each variable. Descriptive statistics are provided in Table 2.

Age. Age has been hypothesized as a predictor of SGM attitudes, with older adults experiencing greater anti-SGM bias (Bidell, 2013). Age was captured as a continuous variable. The homogeneity of age within the sample justifies exclusion in the exploratory models. In addition, age is not a variable that graduate health professional

programs can meaningfully use to enhance future efforts toward SGM-affirming curriculum integration or culture.

Race. Past research has demonstrated that whites are typically less biased than non-whites (Chng & Moore, 1991; Black et al., 1996; Green et al., 2018). Race was captured as a categorical variable: Asian; black or African American; Hispanic, Latino, or Spanish origin; white; and other. Race is a complex construct, and non-white race is not monolithic, so differences between white and "non-white" race would be difficult to interpret. This variable was excluded as an explanatory variable due to heterogeneity in the non-white group.

Professional role. The way that professional identity interacts with SGM attitudes remains unclear. While there is not strong evidence to explain how professional roles correlate to anti-SGM bias, Wilton et al. (2014) found that psychology students were more SGM-affirming than nursing students, and Green et al. (2018) found that dental and nursing students had less interest in receiving SGM education than medical students. Respondents were asked about primary role at the university with the following answer options: Staff; student-undergraduate; preclinical student of medicine (M1, M2); clinical student of medicine (M3, M4); student – other graduate health professional; post doc; faculty; other. Only medical and other health professional graduate students were included in the secondary sample. Professional role was excluded from the models due to the heterogeneity of graduate students in the non-medical student group which prevents meaningful interpretation of categorical comparisons. Since all participants in the limited sample (n=48) had to respond to questions about number of SGM patients seen in the last six months, it was assumed that all respondents have patient interaction in common.

Religion. Past research has suggested that conservative religion and fundamentalism are predictors of anti-SGM bias (Cramer, 1997; Kissinger et al., 2009; Morrison, & Morrison, 2011). Religion was captured as a categorical variable: Options were: 1) Agnostic, 2) Atheist, 3) Christian-Catholic, 4) Christian-Protestant, 5) Jewish, 6) Muslim, 7) Other, 8) Prefer not to answer. This variable was excluded in the models due to the heterogeneity of non-Christian groups, making meaningful interpretation of findings a challenge. In lieu of religion, religiosity and spirituality were explored as potential explanatory variables.

Other variables that have previously been associated with greater SGM bias that were not asked about in the primary study include belief in traditional gender roles (Swank & Raiz, 2007; Morrison & Morrison, 2011); acceptance of male aggressiveness (Swank & Raiz, 2007); racism (Morrison, & Morrison, 2011); lack of egalitarian humanism (Morrison & Morrison, 2011); and rural living (Herek, 1994; Cramer, 1997; Klotzbaugh & Spencer, 2014). Lower educational attainment has also been studied as a predictor of anti-SGM bias (Morrison & Morrison, 2011); however, the sample was a graduate health professional student population with similar educational attainment, so this variable was not relevant to the present study.

Statistical Analysis

Exploratory analysis for model composition. Multiple linear regression was used to test the value of an eight-variable model (Full Model) for each criterion variable. The eight independent variables were: sexual orientation, sex, political affiliation, religiosity, spirituality, SGM affiliation, number of SGM-specific training hours, number of SGM patient interactions in the last six months. Statistical significance of independent

variables within each model as well as percent of variance explained was examined. Using Cohen's (1988) benchmark's for a small proportion of variance explained, any variable explaining >2% unique variance was included in the Reduced Model. For all Reduced Models, interaction effects were examined by creating cross-product terms (Kelley & Maxwell, 2010). Selection of final variables was based on model comparisons (Kelley & Maxwell, 2010; Maxwell & Delaney, 2004).

Statistical tests. Multiple linear regression was used to test all models. Independent variables in each model were set as fixed factors. Models were examined for statistical significance and proportion of variance explained based on Cohen's (1988) benchmarks: small (R^2 =.02), medium (R^2=.13), and large (R^2=.26).

Interpretation of models. Descriptive and inferential statistics were reported. Ordinary Least Squares was used to test individual predictor variables. Multiple *R* was reported for correlation between the criterion variable and all predictors in each model. Multiple R^2 was reported for percent variance in each criterion variable explained by all predictors in each model. Reduced Models were considered meaningful and parsimonious if there was no more than a 10% drop in total variance explained between the models.

Statistical assumptions. Use of multiple linear regression assumes linearity, multivariate normality, independence of observations, homoscedasticity, normal distribution of residuals, specification, no measurement error, and noncollinearity. Linearity for continuous variables was assessed through scatterplots of Reduced Models for clinical preparedness and behaviors (Statistic Solutions, 2019). Histograms of distributions of each outcome variable were examined for normality separately for sexual

orientation, sex, political affiliation, religiosity, spirituality, and SGM affiliation (Statistic Solutions, 2019). Scatterplots of continuous variables (number of patients seen in the last six months and number of training hours) supported the assumption of linearity and reasonable distribution of residuals.

The independence of observations was partially established by ensuring mutually exclusive categorical options for independent variables used in the multiple regression models (Statistics How To, 2019). However, the survey was administered to each respondent online via a RedCap survey link, and it was possible for respondents to answer the survey more than once—therefore, it is possible that independence of observations was compromised. Scatterplots of residuals were examined to assess homoscedasticity (Statistic Solutions, 2019). Specification was determined by including all variables that could reasonably explain the variance of criterion variables based on extant literature (e.g. personal characteristics of medical students, number of SGM training hours, number of SGM clinical encounters). All variables that could be important in explaining variance that were included in the primary data set were included, with the exception of religion and race for which the sample was not sufficiently large to meaningfully interpret any differences that might be found. All dependent variables were latent, so there was a known degree of measurement error due to social desirability bias when collecting self-reported attitudes on a highly-charged social topics. Latent variable analysis requires large sample sizes that were not available for this study. This was a limitation of the study. Tolerance and Variance Inflation Factor (VIF) for all predictor variables were examined to assess noncollinearity in Reduced Models. Collinearity was

satisfactory with tolerance for all predictors >.10 and VIF<10 for Reduced Models selected for each criterion variable (O'Brien, 2007).

Anonymity and Confidentiality. Quantitative data was accessed from a former study determined to be exempt by the GW IRB (#180645). All data reported is in aggregate (e.g., sums, standard deviations, means, etc.). No identifying information was available in the sample.

Data management. Secondary data was stored in a Box folder on secure GW servers and accessible only to the student investigator. Output was shared with the quantitative expert (BW) on the dissertation committee, and all analyses were reviewed and discussed. Quantitative data was analyzed using SPSS 24 (Armonk, NY).

Ethical considerations

Ethical considerations for the primary study included potential discomfort in answering certain questions, such as considering one's views about sexuality, sexual orientation, and gender. There are no additional ethical considerations for the proposed secondary analysis, since the data was extracted from an existing data set. There was no greater risk of loss of confidentiality and no additional psychological stress associated with the secondary analysis that was above and beyond that of the initial, primary study.

Qualitative Strand

Participants

Faculty and co-authors who implemented an SGM curricular intervention in an academic setting and published findings within the last five years were invited by email and/or phone to interview (N=21). Eligible institutions are listed in Appendix C. If the first author contacted did not respond, they were contacted again and then considered

nonresponsive. If the first author contacted was non-responsive, a co-author was contacted. Each co-author was contacted up to two times; if they did not respond, they were considered non-responsive. If an author responded, but recommended a different author or colleague to be interviewed instead, the referred individual was invited to interview. Referred interviewees were approached following the same protocol above: they were contacted up to two times and an interview was scheduled if they were responsive. If an individual scheduled an interview but did not attend the interview, they were contacted up to two times to reschedule and then considered non-responsive. See Figure 8 for the qualitative sampling process.

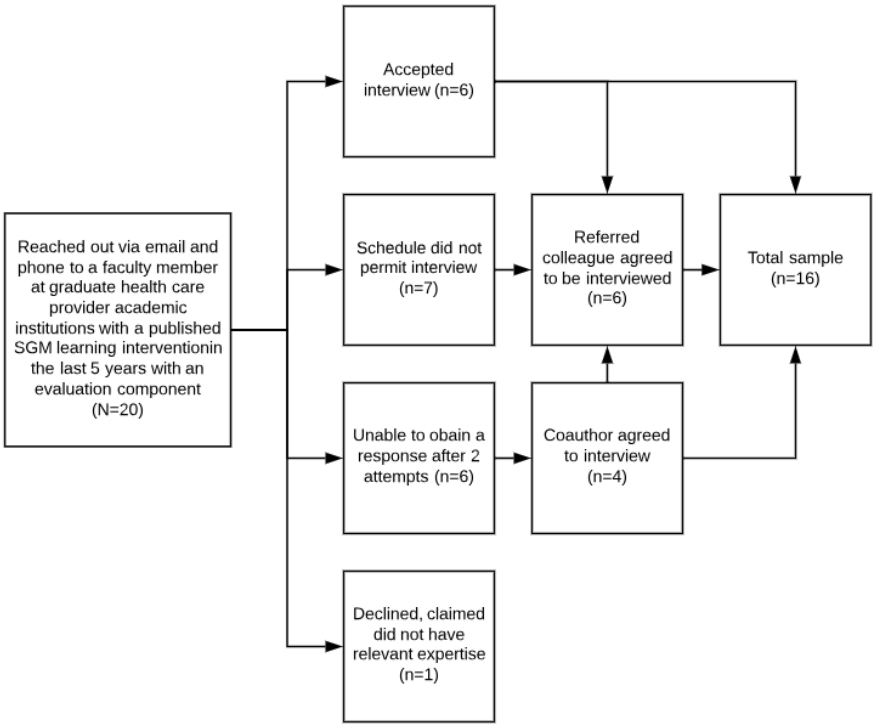

Figure 8. Sampling process for Qualitative Strand

Instrumentation

The interview guide was structured based on constructs from the CFIR (2019). Specifically, the semi-structured interview protocol included questions focused on the learning intervention, external factors, internal factors, stakeholders, and implementation process.

Procedures

The following criteria were used to establish trustworthiness of qualitative findings.

Credibility. Credibility was established through advisor feedback on research design and instrumentation, independent coding and comparison of identified themes, and triangulation with quantitative findings. The Committee Chair (LD) reviewed the design of the interview guide (Appendix E) to ensure comprehensive, meaningful data collection (Lincoln & Guba, 2005). LD also reviewed the codebook established by MPC and provided feedback. Findings from the interviews were triangulated with quantitative findings to identify tailored recommendations for GW SMHS and other institutions wishing to advance SGM curricular improvements in academic settings.

Transferability. Transferability of findings was established through thick description, memoing and transparency of data collection protocols (Lincoln & Guba, 2005). A peer researcher with expertise in SGM curricular change in two academic settings also reviewed the findings to confirm transferability.

Dependability. Study documentation is provided in Appendices C-F that could be used by an independent researcher to replicate the study. MPC documented adherence and non-adherence to the stated protocol. The Committee Chair audited the research

protocol to evaluate the research process and ensure that reported results were accurate (Lincoln & Guba, 2005).

Confirmability. The researcher documented self-reflexive memos on a regular basis throughout the interviewing and data analysis phases. The research process documentation contributed to confirmability through Committee chair auditing (Lincoln & Guba, 2005). Member checking was used by sharing thematic codes and examples of themes with interviewees prior to data reporting. Participants in the study were invited to provide feedback on the accuracy of the thematic analysis (Lincoln & Guba, 2005).

Anonymity and Confidentiality. Interviewees were not patients. They were recruited based on publicly available data associated with published learning interventions. Themes and quotations used to exemplify themes do not identify the interviewee nor the institution where the intervention was implemented to maintain anonymity. However, given the small number of institutions who have led curricular change in this area, it is possible that information could be suggestive of particular institutions.

Data management. Recordings of WebEx videos and audio files were stored in a Box folder on secure GW servers. Qualitative data were transcribed by uploading to Rev.com (San Francisco, CA), a secure platform that stores and transmits files using TLS 1.2 encryption and a 128-bit AES key (Myers, 2107). Transcripts were de-identified and stored in a separate Box folder available only to the student investigator and the Chair. Transcripts were uploaded into NVivo 12 for coding and analysis.

Data analysis

Coding. The student researcher (MPC) conducted open, single coding using a mixed inductive-deductive process. Deductive coding included examination of implementation domains of the CFIR—including learning intervention characteristics, implementation process, inner setting, outer setting, and individuals involved. In addition, parent nodes of "sustainability" and "looking ahead" (future needs for the field) were established. Within those parent nodes, inductive coding was conducted to illuminate major themes (child nodes). Within themes, sub-themes or descriptive examples were coded as grandchild nodes. After review and discussion by the Chair (LD), it was determined that the narrative would discuss themes through temporal phases: Foundation, Planning, Implementation, and Sustainability. Thus CFIR domains were discussed in the context of these temporal domains. See Figure 9 below.

Ethical considerations

Ethical considerations for the qualitative strand were primarily potential discomfort in answering certain questions; however, respondents chose to champion SGM curricular interventions, so this possibility is minimal. All respondents had publicly available contact information and were queried about activities related to their professional roles.

Mixing of Data

Qualitative findings provided critical data to inform tailored recommendations to address gaps in student preparedness to care for SGM patients identified in the quantitative study.

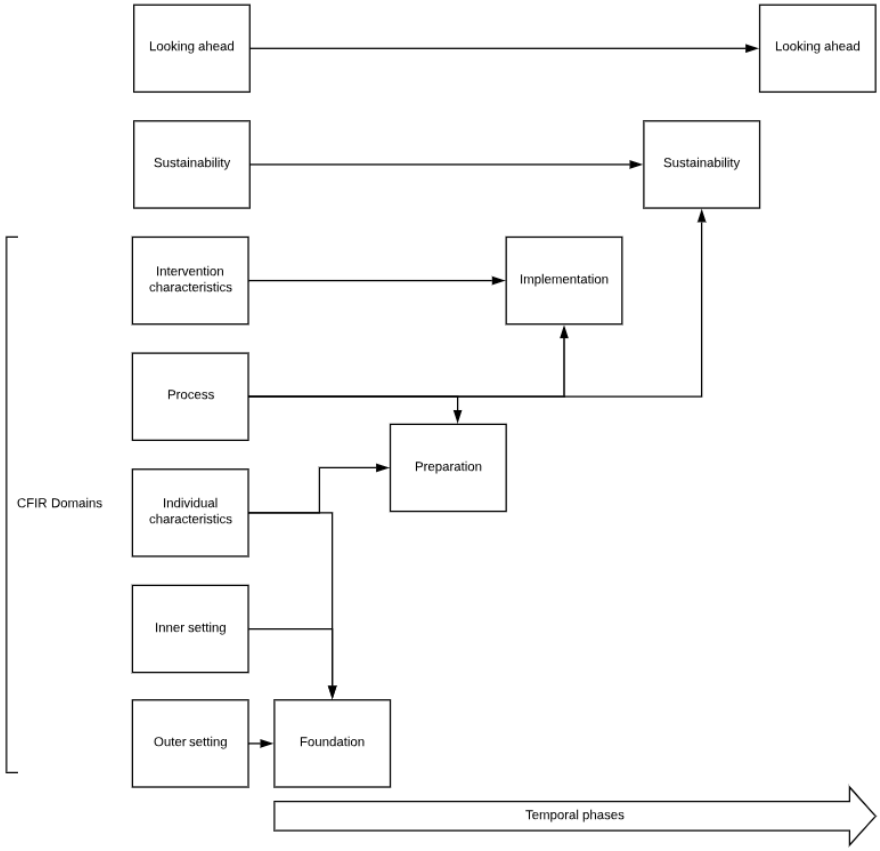

Figure 9. Coding scheme from CFIR domains to temporal phases

Triangulation of data: Creation of recommendations

After identifying explanatory variables through the quantitative strand, qualitative themes that informed ways to address quantitative differences in self-reported student knowledge, attitudes, clinical preparedness, beliefs, and behaviors were triangulated and presented in Chapter 5. In addition, past research that was further supported by findings from this study are discussed in Chapter 5.

Data reporting: Joint Displays of Data

Findings in the qualitative strand that were potentially responsive to learning gaps identified in the quantitative strand are presented in a joint display of data in Chapter 5.

Quantitative findings are presented in aggregate in Chapter 4 and broadly summarized in the joint displays in Chapter 5 (Creswell & Plano-Clark, 2011). Quotations were used to explain lessons learned that impact implementation and sustainability of SGM curriculum success in other academic settings. Quotations do not identify participants or use individual identifiers of any kind.

Dissemination and Implementation

Primary data reporting is in the form of this dissertation report. Outcomes will also be disseminated via national conferences and peer-reviewed publications.

CHAPTER 4: RESULTS

This was a mixed methods study with concurrent quantitative and qualitative strands. The overall purpose of this study was to leverage qualitative insights from other institutions that could be helpful in addressing differences in health professional student knowledge, attitudes, clinical preparedness, beliefs, and behaviors about SGM as reflected in mean scores based on independent variables tested in exploratory models. The research questions were: RQ1) What Reduced Models explain a meaningful amount (≥0.15) of total variance among health professional student self-reported knowledge, attitudes, clinical preparedness, beliefs, and behaviors regarding SGM patient health and health care?; RQ2) What lessons have champions at other institutions learned about implementing SGM curricular change?; and RQ3) How can implementation lessons from other institutions be used to improve GW health professional student preparedness in caring for SGM?

Quantitative Strand

Research question 1 (RQ1) was hypothesis driven and answered by the quantitative strand: What Reduced Models explain a meaningful amount (≥0.15) of total variance among health professional student self-reported knowledge, attitudes, clinical preparedness, beliefs, and behaviors regarding SGM patient health and health care?

Hypothesis: Reduced Models for Criterion Variables

The first hypothesis was that in a sample of health professional students at an urban academic center, at least one Reduced Model comprised of fewer than eight predictor variables would explain a meaningful amount of total variance for each outcome variable ($R^2 \geq .15$), using multiple linear regression. The outcome variables were

knowledge, attitudes, and clinical preparedness based on the LGBT-DOCSS, attitudes based on the ATLPS, and beliefs and behaviors based on the GAPS. See Figure 5 above for a diagram of predictor variables and criterion variables.

Correlations and Model Fit. Correlations of all independent variables and each criterion variable were examined (See Tables 4-9 in Chapter 3).

Testing Exploratory Models. In order to test the hypothesis for RQ 1, a multiple linear regression with eight independent variables was conducted for each of the six criterion variables. Eight independent variables were included in Full Models, and independent variables that explained >2% unique variance in the sample were retained for the Reduced Model. Results show that Reduced Models explained a statistically significant amount of variance for knowledge and attitudes subscales of the LGBT-DOCSS, for the one-factor attitudes ATLPS, and for the beliefs and behaviors subscales of the GAPS ($p \leq 0.05$). No other statistically significant results were found. See Tables 10-15.***Interaction effects.*** For all Reduced Models, interaction effects were examined by creating cross-product terms (Kelley & Maxwell, 2010). An interaction between spirituality and number of SGM training hours was found for the GAPS-Behavior Reduced Model (p=.02). No other interaction effects were observed for any other criterion variable. Since only one interaction in one Reduced Model was significant, results are reported without interaction effects.

Qualitative strand

The qualitative strand answered research question 2: What lessons have champions at other institutions learned about implementing SGM curricular change? Interviews (n=16) were conducted with champions of learning SGM curriculum

interventions in other medical, nursing, and pharmacy schools from across the U.S. and in one international setting. Inductive coding was performed within seven overarching, deductive domains: individual characteristics, intervention characteristics, inner setting, outer setting, process, sustainability, and looking ahead. The first five domains represent CFIR domains: The CFIR was the implementation framework that guided the qualitative strand in order to improve the translational impact of the findings. The "sustainability" domain captured factors that supported integration and continuation of the SGM curriculum long-term. The last domain, "looking ahead," intended to capture future directions needed for the field based on interviewees' expertise. The results identified important implementation factors for successful SGM curricular change as well as a number of lessons learned that are transferable to other academic settings. Themes identified using the CFIR domains were rearranged with child nodes redistributed under the following temporal phases: Foundation, Preparation, and Implementation. Sustainability and Looking Ahead were retained as nodes that were already descriptive of temporal phases.

All interviewees (n=16) were provided with the qualitative findings reported below. Seven interviewees responded to the invitation for review, indicating that the themes identified accurately reflected their experiences. One participant provided a helpful suggestion to revise "pharmacy" to "pharmaceutical" institutions. Another participant asked if the issue of harassment toward SGM students and patients had come up during interviews. Since this had not emerged as a theme beyond a high-level suggestion of disparity between hidden and formal curricula, this feedback was not addressed in the final description of themes. In addition, a subject matter expert (SME)

reviewed findings for transferability. The SME recommended greater emphasis on SGM community organization reliance as a cross-cutting theme, and more detailed information on resources provided to demonstrate institutional commitment. However, the data did not support reliance on community organizations as a cross-cutting theme. While important, the theme that emerged was leveraging SGM expertise—whether in the form of community-based organization representatives, faculty experts, or patients. In response to the request for more detailed information on resources, additional examples were provided in the final text under institutional commitment of resources.

Foundation

Foundation refers to the influencing factors that existed prior to the introduction of the SGM curricular intervention. Specifically, this includes what the CFIR would refer to as "inner setting" and "outer setting." Sociopolitical context, availability of external guidance, organizational culture, institutional commitment, and curriculum champions emerged as major themes for this temporal phase.

Sociopolitical context. The sociopolitical context within which SGM curricular change was situated was mentioned by participants, but not cited as a major driver of motivation for curricular change. Sociopolitical context was discussed in terms of how national, state, or local politics influenced responses to SGM curricular change from community members outside the university, and shaped the expectation of incoming students. Some institutions prepared for conservative political backlash, while others did not anticipate community responses until they happened:

> So, with some of the roll out with, for instance, assimilation in curricula, the backlash from community related to why are we teaching on this population? You

> know, it's public schools in all the locations that we're doing it. So where the schools thought it was good, public backlash kind of similar what you see in the media. You know, it is a disparaged population. So you have people who are against that population for whatever reason coming out against teaching related to that. (Participant 13)

Administrator preparation for negative community responses did not necessarily correlate with actual backlash. Community responses did not impede curricula from moving forward, but did raise decision-maker awareness of community dissent.

In contrast, greater community awareness at a national level was noted as a facilitator for dialogue among students and faculty:

> [There's] a lot more recognition and awareness, you know... Things that have been very, very visible that... have shaped kind of the national dialogue… I think people's awareness, of what these things are and what these things mean--you know, we obviously live in a society that continues to evolve. (Participant 5)

The evolving national dialogue was influential to curriculum changes over time, primarily because each incoming class of students were increasingly inclusive and "out": "[H]aving the next generation come in and be so accepting of each other and, for the most part, and having students that are out and vocal and transparent about who they are. And, just expect acceptance" (Participant 1). The changes to incoming student bodies required greater sophistication in SGM content in the curriculum over time:

> I think we, as time has progressed, students… give me feedback and say, "Well, this isn't really news to me." Or, "I don't need to learn about this, because I already know it." When we started off, people were saying, "Wow, this is so eye-

> opening." Or, "I don't really wanna know about this," because it was uncomfortable for them, given their religious beliefs or other beliefs that they had. (Participant 2)

In sum, sociopolitical context had two primary influences on SGM curricula: 1) students provided real-life examples of the changing sociopolitical context; and 2) backlash against SGM curricula could raise concerns among administrative leadership, but ultimately did not impede SGM curricular advancements.

External guidance. Information and guidance from credible sources was another major external factor that changed over time. Interviewees that were early champions in the 2000s and early 2010s indicated a lack of any real guidance from health care professional organizations, guideline bodies, or the research literature: “So when [we] … looked for material… there was nothing, really…to find, because this was back in either 2011 or 2012” (Participant 4). The most cited guidance, by far, was the AAMC’s 2014 report, *Implementing Curricular and Institutional Climate Changes to Improve Health Care for Individuals who are LGBT, Gender Nonconforming, or Born with DSD: A resource for medical educators*: “[T]hose are really our marching orders. I mean, we work from those competencies, that's how we diagrammed out a whole curriculum. What would go where, what the sub-competencies or learning objectives would be, what the assessments would be” (Participant 1). *The Fenway Guide to Lesbian, Gay, Bisexual and Transgender Health* (Makadon, et al., 2008), Fenway Institute online resources, the Lambda Legal report *When Health Care Isn’t Caring* (2010), and the 2011 Institute of Medicine report *The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding* were also cited as lending credibility to

SGM curricula already underway and provided additional support for the goals of new SGM curriculum champions.

Organizational culture. Organizational culture was a critical "inner context" factor for success. Culture included organizational values and the "hidden curriculum"--or the ways in which clinical practice and faculty behaviors reinforced or contradicted what was taught in the classroom. Institutional commitment, which came in the form of leadership support, financial resources, protected faculty time, and staff support, was key. Cultural values and mission of the organization emerged as important pillars of support for SGM curricular success:

> They view themselves… as mission driven and they're not the charity hospital…That is not what they do but in their own brains, like the high up people, they're a religious charity. That's how they think of themselves. So they've been doing mission work since the 1800s when they were founded and interestingly, [serving SGM populations] aligns for them too. (Participant 11)

Culture was also reflected in the "hidden curriculum": "I mean in general so much of med school learning is the hidden curriculum. How you model it, what words you use to describe certain patients, I mean that extends to so many things beyond sexual gender minority status. And it's really variable depending on sites as well" (Participant 10). Alignment of the hidden and formal curriculum was a cross-cutting facilitator for success in SGM curricular change from foundation through sustainability temporal phases.

Institutional commitment. Culture was closely linked to institutional commitment. Commitment came in several forms: leadership support, staff support, and protected faculty time. Leadership support was key to moving new curricula forward:

"[I]f he hesitated or hadn't given me the top cover to really kind of push on this and be very visible, then I don't know if we would have moved forward" (Participant 5). Faculty and staff time were other important indicators of institutional commitment. Staff support was noted as a major facilitator:

> [The investment the institution made in the LGBT center. I mean, this work would not have moved forward without having someone [who] is a passionate advocate and great at getting people together, and she's got this strange ability, like nobody can say no to her (Participant 1).

Protected faculty time to develop and implement SGM curricula was another example of institutional support in action: "I got time carved out to work on this and then when I became dean… I carved out faculty time to work on curriculum" (Participant 7). In contrast, the one outlier who did not receive institutional support confirmed that the absence of support prevented curriculum change from succeeding: "[I]f we're really gonna be serious about this we have to think about ways that… have some kind of financial and institutional support and ... I can't think of the word, but you know it can get, get to be kind of put into the brick and mortar a bit, you know?" (Participant 3). The same interviewee was frustrated by the expectation for volunteerism: "I think the biggest issue for me really is, it just seems like what institutions want is somebody at the institution to, to take this on and to do it as an add-on. So I've heard that from a lot of people and I've experienced that myself" (Participant 3). Lack of staff support was mentioned by another participant as challenging: "The other aspect that's just been hard is that I don't have any administrative support so I just.. organize it in… my free time" (Participant 8). While it did not emerge as a theme, money was cited by two participants

as a moderating force: “Money is probably one of the big issues that has caused any change [over time]…the fees of the Out Alliance have increased and our funding has decreased, so I have reduced the timing” (Participant 2).

Institutional champions. The final foundational ingredient for success was an empowered, motivated institutional champion. Faculty reported being in a position to either directly change curricula within a course they directed or feeling empowered by administrators to enact broader curricular change:

> I called it a content change. I said that curriculum would just be the general endocrine curriculum, but I was adding a little bit of content to what the general endocrine curriculum should now be…So the point is, I didn't ask anybody and so that helped. (Participant 11)

Those with more authority over the curriculum were able to enact broader change: “I led the efforts to create the competencies around cultural competence that we use in our school, and was responsible for the content” (Participant 7). While participants described varying levels of institutional authority, all faculty champions felt empowered at some level to enact curricular change.

In addition to being in a position to enact change, institutional champions noted a motivation to advance health equity and social justice:

> [I]t doesn't matter what your personal belief system is related to transgender health or care. If you believe that people should be transgender or don't believe that they should be is irrelevant. Their human health is what's relevant. So we have people that can't access healthcare based on their provider bias. (Participant 13)

Participants were motivated by various experiences—experiencing discrimination, hearing of others' experiences with health care, or addressing a learning gap in their own education—but all were motivated at some level to address health equity for SGM through curricular enhancements.

Preparation

The CFIR "Process" domain was relevant to preparation, implementation, and sustainability temporal phases of SGM curricular change. The importance of needs assessment, strategic planning, and considering contingencies (facilitators or barriers to curriculum enhancement) emerged as important for preparation. Two themes that were cross-cutting from preparation through sustainability were use of data and collaboration.

Needs assessment. Use of data in the preparation phase related to needs assessment processes that ranged from informal conversations with peers to formal survey-based assessments across departments:

> I figured there's no point in just starting something if, with stuff that I think is important if other people are like, 'We already know this, but we really wanted to hear about—'So I just tried to ask around and to see what people knew about and what they didn't know about. And kind of get it from that perspective (Participant 4).

Other approaches to needs assessment included data from research with community members and literature review to identify important SGM health considerations not being taught.

Strategic planning. Planning involved various levels of engagement from different stakeholders. Collaboration was a key ingredient to strategic planning. Like

needs assessment, there was a continuum from informal collaboration among peers to formal faculty retreats aimed at strategically mapping SGM content onto the core curriculum: “We planned a curriculum retreat to incorporate sexual orientation and gender identity into the curriculum. And so…we had a lot of planning” (Participant 7). The creation or use of standing committees, steering committees, or task forces was reported as a common vehicle for planning with diverse stakeholders. Use of existing faculty were more commonly used for these committees, but SGM community members outside academia were sometimes also tapped for their expertise: “We formed a community advisory committee… [a]bout eight community members… met monthly for about a year, and reviewed all the curriculum content and offered feedback. [I]t was, ya know, nothing about us, without us, kind of thing” (Participant 1).

Contingencies. During the planning phase, curriculum revision and time constraints were major contingencies. Curricular revision was seen divergently as an opportunity or obstacle: “We were undergoing curriculum renewal anyway. So, it was a good time to take advantage of that opportunity and - to kind of focus changes into all the other changes that were happening anyway” (Participant 1). The same participant mentioned that ongoing change was part of the culture, which facilitated SGM curricular introduction: “Faculty are really not used to having anything be the same from one year to the next….So, it made making changes a little bit easier” (Participant 1). In contrast, curriculum revision was noted as a barrier by others: after an intentional effort to add substantial SGM content to the curriculum, “a lot of that content and initial work was lost” when a subsequent curriculum revision shortened a traditional two-year preclinical education to thirteen months (Participant 5).

Another major contingency reported by participants was time. Like curriculum revision, time constraints were divergently perceived as a barrier or an opportunity. Fitting additional content into an already packed curriculum was an obstacle: “[T] he other big challenge would actually be curriculum being very impacted” (Participant 7). In contrast, time constraints were perceived by others as an opportunity to be more intentional about how medicine is taught:

> We need to do a better job of intentionality. You know, and to move away from this old model of, I just spew every piece of knowledge that I have versus, what do they really need to know, what can they look up later, what's available in the database? You know, what's going to give them the foundation to be successful and I see that an awful lot in kind of, our curriculum. That it's too jam packed and the students are too stressed to even think about adding something else in. But if we were more, if we removed redundancies and were more intentional there would be space for things that are important and quite frankly, I feel like a curriculum should be a living organism and to be stagnant to what we taught ten years ago even. (Participant 6)

In sum, participants emphasized the importance of assessing need and strategic planning—including planning for and in response to the contingencies of curriculum revision processes and time constraints.

Implementation

Implemented SGM curricula varied in depth, level of integration, and topics covered. A major emerging theme that shaped curricular content was the availability of faculty expertise. The use of SGM community members and SGM faculty as experts was

common. Experiential learning for students to work with SGM people emerged as a valuable addition to classroom content for early champions who were expanding their SGM curricula over time.

Variation in depth and integration. Interventions were diverse, ranging from nonacademic community member panels held during one class session to complete curriculum overhaul layered throughout four years of training. The level of integration also varied widely from student-led projects without clear sustainability to course directors adopting particular content for their course to curricular leaders requiring students to demonstrate competencies in sexual and gender minority health in order to graduate from medical school. Level of integration had direct bearing on perceived impact and sustainability of the intervention. Highly integrated approaches to curriculum revision delivered content strategically at relevant, teachable moments:

> Like, if we're talking about hormonal medication when we talk about ... we teach about hormonal medications, they're used to treat prostate cancer, they're used to treat breast cancer, they're used to prevent … conception, and they're used for multiple other purposes, and they're also used for gender affirming care in transgender patients. So, we would just--integrate to that content. When we taught the sexual history, we just integrated more affirmative inclusive language, and kind of broadening what you ask about, and what specific questions you might ask. So we didn't have a, oh, and once you realize your patient's gay, you need to do these sort of things. It was more...Like, kind of approaching the personhood, and then things would unfold a little bit more naturally. When we talk about, when we teach about healthcare disparities, talking about specifically the

> healthcare disparities for this population, and where their roots are, we talked about psychiatric treatment... and counseling specifically, teaching that conversion therapy is contraindicated in, in, you know, carries with it a higher risk of suicide We are teaching this stuff anyway without being inclusive, affirmative, or getting us closer to these goals, and what do we need to do differently to move that along. (Participant 1)

In contrast, student-led elective interventions were at greater risk of being perceived as a less important than core curricular content: “I kind of had classmates feel like this was more cosmetic, elective stuff that I was teaching, or trying to teach” (Participant 10).

Content expertise. The availability or lack of content expertise directly shaped what was included in the curriculum. Participants reported that faculty colleagues did not teach SGM content because they did not feel they had the appropriate expertise: “[F]aculty may want to do it but they don't feel comfortable doing it. They don't feel comfortable teaching it. So part of it is, you know, the curriculum, the cultural competence folks, we need to do our homework in terms of identifying and securing the resources, the content expertise” (Participant 7). To address this gap, external subject matter experts were brought in to build capacity among internal faculty:

> [W]e hosted a one day faculty development event that brought in [experts] from their respective institutions as national leaders in LGBT care, and medical education related to LGBT care, to develop all of our faculty that we felt would have a role in adapting our education, and- and refining our education offerings to students” (Participant 1)

Community organizations with expertise were also used as subject matter experts to directly teach students: “[H]onestly, because I was so new to this and, initially the very first time I had just done a Safe Zone training, it opened my eyes. And, I asked the Gay Alliance. Like, I kinda followed their lead about what should be incorporated” (Participant 2).

Interaction with SGM. Curricular approaches generally focused on or included exposure to SGM peoples’ lived experiences through personal interaction, question and answer community member panels, faculty narrative, or virtual documentary. Participants emphasized the importance of narratives from the SGM community to combat bias:

> It's much harder to you know, hold steadfast to your ideals and say, I do not support and I will never, and then all of a sudden somebody comes out and says, yeah, well, my daughter, my son, my family member…And now all of a sudden they've done a 180 in their personal position on something... it's easier to hold a bias on a concept. It's harder when somebody is in front of you and they're telling you their life story and they're explaining the challenges that they face and how pharmacists either helped or hurt in their personal journey. I think it's much harder to, to walk out of that experience and say I wasn't touched. (Participant 6)

Panels where students could ask questions of SGM community members were described as highly impactful:

> But when you see them actually engaging and talking to the students, that's where it was like, ‘This is what students need.’ They need to understand that these are individuals. To have that really open discussion with them. And it was remarkable, it was remarkable (Participant 15).

Intentionality and inclusivity. A cross-cutting theme was the importance of countering bias and avoiding stereotypes of SGM people in curricula. Specifically, participants noted the importance of including content that provided a fuller picture of SGM health than stereotypical cases of SGM with HIV and mental health problems: “I graduated in 2011…so somewhat recently. But my clinical and pre-clinical education was: "HIV happens more frequently to gay men. The end." (Participant 9). Intentionality in planning and refining curricula was a way to address inadvertently perpetuating stereotypes:

> Just taking a survey of what you have available and thinking of different ways that you can make it more inclusive is going to be helpful. And trying not to pathologize personality, or personal characteristics so not inadvertently only ever talking about gay men, when your discussing HIV, or stuff like that, so just trying to be deliberate about avoiding some of those associations that can develop, is really important (Participant 12).

This intentional approach to avoiding stereotypes reinforced the importance of thoughtful planning and preparation when creating curricular content. Collaboration between diversity and inclusion and curriculum leadership was another strategy to build an inclusive learning environment: “[Y]ou can't just have diversity champions. You have to also have education champions working together” (Participant 7).

In the implementation phase, specific topics varied widely as did the level of integration into core curricula. What emerged as important across settings was identifying and/or developing content expertise, fostering student interactions with SGM people, and

being intentional about avoiding stereotypes while also working to build an inclusive environment.

Sustainability. Sustainability depended on two primary factors: collaboration for multi-level engagement, and alignment of formal and hidden curricula. Use of data also emerged as a theme to demonstrate the need for SGM curricula to continue.

Collaboration. Multi-level engagement was a cross-cutting theme that began during preparation and persisted through implementation and sustainability. Level of collaboration had a direct impact on the reach and sustainability of learning interventions over time:

> [W]e've ended up improving over all the reach of the information so that all of our preceptors got a chance to review that information, which I think was helpful, because a lot of more senior physicians haven't had any training in this area. So it was helpful in that way, and it also, instead of just relying on one expert, it kind of allowed, we were able to show that non-experts could also teach this content, if they had appropriate material. (Participant 12)

At institutions reliant on only one person that champions SGM content in their course, sustainability of SGM content was vulnerable to faculty retention: “My bigger question would be, what happens if [she] leaves? What happens, is there somebody who is going to step into that role if she goes?” (Participant 6). In addition, at institutions where SGM content was only included in the courses of one or few faculty, student exposure was limited: “So, my course is pretty much the only content, LGBTQ content that is in our curriculum to my knowledge. I haven't sat in on every class, but to my knowledge” (Participant 2).

Alignment of hidden and formal curricula. A theme in the Foundation temporal phase, institutional resource support through protected faculty and/or staff time, was also noted as important for sustainability. At institutions where hidden and formal curricula were aligned, synergistic activities emerged to reinforce learning in the classroom. These efforts reinforced a culture of diversity, inclusion and social justice. Efforts included direct and ongoing campus outreach to raise awareness among diverse stakeholders that SGM health was important; new clinical services for SGM patients—especially transgender patients; and environmental changes to make clinics more SGM affirming. Additional singular examples of efforts to make the clinical environment more SGM affirming and to align formal and hidden curricula included establishing a concierge service specific to SGM patients and developing a mentorship program to match incoming SGM medical students with "out" faculty.

The most common change that occurred to align new SGM formal curriculum with the hidden curriculum was new or expanded opportunities for students to have relevant clinical rotations. These clinical opportunities to work with SGM emerged among institutions with longer-standing programs and organizational cultures that aligned the formal and hidden curricula. Clinical rotations were described as "very synergistic and important in allowing the educational component to work" (Participant 5). Clinical rotations were valued for reinforcing what was taught in the classroom through direct SGM patient interaction: "[T]hat's the thing that really seals it is when people have an opportunity to take care of real people, well medical trainees have a chance to take care of real people" (Participant 7). Institutions were in various stages of making such experiential opportunities available to students with some just getting started:

> So our next step was to then take sort of some of that training and it's like all right, well, we're training faculty, staff, students, for our students to go out on experiential rotations and if our preceptors are mirroring what we think is important, not just content wise but philosophically what we think is important for students to be doing, then we're missing a piece" (Participant 6).

These environmental improvements and expanded clinical opportunities reinforced the message to students that SGM health was unique and important for their clinical practice.

Use of data. Evaluation data was also mentioned as important to demonstrate the need for the curricular content continue:

> I think, the other really important thing that we did was that we gathered feedback… in terms of what people found useful in the workshop, in addition to, we did like a pre-workshop questionnaire about how confident people feel about managing patients who identify as LGBT… and then kind of how confident they felt after the workshop…And we could demonstrate, then, that people actually found the workshop helpful. (Participant 4)

Evaluation data was used to improve and retain curricula based on student feedback: "I think that student reflections and student feedback on how impactful that was, is the reason that we continued it. I mean other things came and went but that very consistently stayed in our, our syllabus because the student feedback was that it was really important" (Participant 6).

Looking Ahead

While the primary purpose of this study was to examine experiences and lessons learned at other institutions to inform recommendations for GW SMHS curricula, insights

on where the field of SGM health education and research were sought to help inform future academic efforts. Two major themes emerged for future directions: the need for better evaluation tools and the need to incentivize inclusion of SGM curricula for sustainability.

Need for better evaluation tools. The strongest theme that emerged when asked about what the field needs going forward was better evaluation tools and approaches. Universally, interviewees were unhappy with existing evaluation options in the literature: [H]aving a tool of assessing how good the teaching is would be helpful… to see if people actually retain it for longer than half an hour after they go out of the session" (Participant 4). Some participants specifically mentioned future plans to improve evaluation within their own settings:

> So, we've done the content integration, which is great, you know, we think that our students are learning, but we don't have any milestones in this space that are baked into our assessment tools that allow us to really know, and have confidence, that our students are graduating with these competencies. And, so that's something that, you know, is on our radar, but we just haven't gotten there. (Participant 5)

Incentivizing SGM health in curricula. Participants noted the importance of incentivizing inclusion of SGM content in the curriculum; however, ideas on how to do so were diverse. The suggestions that follow are descriptive, in that they may have been mentioned by only one person, rather than thematic—but taken together they are strategizes to incentivize inclusion of SGM health in health professional student education:

- Embedding into graduation competencies: “[T]he one thing I didn't talk about which I think is really important is embedding it into the graduation competencies ... because once you do that… we did that for cultural competence, and that was really important because once you embed it in the graduation competencies, the licensing body that we call the LCME, the Liaison Committee on Medical Education. They accredit medical schools and they hold you to achieving your graduation competencies. They don't define what it is… they require that the schools define it and then share progress towards it” (Participant 7);
- Presenting the market competition: “If you can say like, ‘Oh, this institution down the street has this awesome curriculum, but we don't. That's a problem.’ Sometimes they'll be like, Oh, well we have to be better than, you know, such and such institution. Sure. Go for it. Give me something" (Participant 9);
- Developing and/or using off-the-shelf resources: “We need to create things that are off the shelf. I want to talk about transgender healthcare okay? Do you want to talk about just LGBTQ basics? Perfect. Here's the module. Do you want to talk about hormone replacement therapy? Great. Here's the module. Do you want to talk about in LGBTQ patients’ substance abuse and depression? Here's where you can go or here are the resources” (Participant 6).

Summary

Implementation constructs from the CFIR overlapped with temporal phases of foundation, preparation, implementation, and sustainability. Themes from the qualitative strand are summarized below:

- Organizational culture, institutional support, and institutional champions were key ingredients for SGM curricular success.
- Inclusive processes for needs assessment and strategic planning were important for successful curriculum implementation and bolstered sustainability.
- Linking diversity and education efforts, partnering with community organizations, and providing experiential learning opportunities were used to increase student exposure to SGM and create an inclusive learning environment.
- Evaluation data was useful across all phases of SGM curricular change.

Mixing of Data

Research question 3 (RQ3) was answered by mixing the quantitative and qualitative strands. RQ3 was: How can implementation lessons from other institutions be used to improve GW health professional student preparedness in caring for SGM? Liberal political affiliation was shown to be a strong predictor in the GW health professional student population in terms of SGM-affirming attitudes, beliefs, and behaviors. Based on qualitative findings, opportunities for exploration of shared values may be helpful to address differences in political values among future physicians to ensure appropriate SGM health care.

> I would look for values that are sort of shared, okay. So the value that may not be shared is LGBT people… don't have a choice with their sexual orientation or gender identity. And another value may be that if I treat LGBT people then I will be sinning or if I… don't try to convert them, I will be sinning. So those are…some very particular values. Having said that… all medical schools are required to train people, to treat diverse communities. Okay. That's an

> overarching value. And so at that point, you know, from a navigation standpoint, I would not go specifically into, you know, hashing that out. What I would do is look at … this value that we can all agree upon and that has been placed upon us by our accrediting bodies. (Participant 7)

In addition, more SGM-specific training hours were associated with greater clinical preparedness and clinically-affirming behaviors. These data suggest the importance of layering curricula at teachable moments that are relevant to student learning.

> The big lesson is it's very easy to implement… We're layering it into an environment where we're already teaching many of those things. So to layer in the idea that there is gender identity development is just not gonna be very time consuming. This isn't like a one week unit on all LGBT issues--and I would even be more extreme: Don't do that. I mean you can do that also and you can certainly do cultural competence and learn terminology and things like that, but in a way this works better isolated out and sitting next to other things that are similar to it. (Participant 11)

Also, SGM contact was shown to be a statistically significant predictor of knowledge, attitudes, and beliefs. Qualitative data reinforce this point. One self-identified SGM faculty member said:

> I might use self-disclosure. I mean I had attempted suicide when I was a youth. I was homeless… I've had a rough road, so I try to use…I'm now comfortable using my story in conjunction with data and research, to really underscore, the vulnerability of the population…I want to change hearts and minds…the way in is

> through hearts. So the only way I feel like I've ever gotten any kind of ... just a bit of a blip is when I tell my own story. (Participant 3)

Student contact with SGM patients, community members, and/or faculty along with newly developed clinical rotations with SGM patients were common strategies in the qualitative strand that aimed to enhance student exposure to SGM.

CHAPTER 5: CONCLUSION

There is a clear gap in health professional student competence in addressing SGM health care needs. Few institutions have begun to incorporate curricular change to address the gap in medical, nursing, and pharmacy student learning. Findings from this study indicate that liberal political affiliation; exposure to and affiliation with SGM friends, family members, and patients; and more training on SGM-specific health improves medical student self-reported clinical preparedness and clinical behaviors. Further, this study provides unique insights on incorporating SGM health curricula into health professional schools in the last decade.

Quantitative Strand

Reduced Models, described in Chapters 3 and 4, explained a statistically significant amount of variance for five of the six criterion variables: knowledge and attitudes of the LGBT-DOCSS, attitudes as measured by the ATLPS, and beliefs and behaviors as measured by the GAPS ($p<0.05$).

For knowledge (LGBT-DOCSS), less religiosity, greater SGM affiliation, and greater number of SGM patients seen in the last six months predicted greater self-reported knowledge relevant for SGM health.

Liberal political affiliation was the only meaningful predictor of SGM-affirming attitudes (LGBT-DOCSS). Political affiliation—only one independent variable—explained nearly half of the total sample variance in attitudes about SGM patients. It is important to note that the political affiliation variable was dichotomized to “liberal” versus “not liberal” by combining conservative, very conservative, neither liberal nor conservative, and apolitical into the “not liberal” category. This was done due to the

small sample sizes for the conservative, very conservative, neither liberal nor conservative, and apolitical categories. Regardless of the unequal samples (almost 90% of the sample identified as liberal or very liberal), the significance of political affiliation in explaining variance in criterion variables tested in this study is striking.

Together religiosity, spirituality, and number of SGM-specific health training hours explained a statistically insignificant, but meaningful amount of variance for self-reported clinical preparedness in caring for SGM patients as measured by the LGBT-DOCSS. The association of strong spirituality with more affirming clinical preparedness and behaviors is a novel finding and contrary to past research reported by Wilson et al. (2014). This is the first known study to report the association of strong spirituality with greater clinical preparedness and more affirming clinical behaviors for SGM patients. It is important to interpret this finding with caution given the interaction between spirituality and number of training hours on clinical behaviors. Further exploration of this association is warranted. It is important to note that greater spirituality did not equate to greater religiosity or vice versa: These variables were negatively associated.

For the ATLPS attitudes scale, sexual minority status, female sex, less religiosity, and greater SGM affiliation together explained a third of the variance in affirming attitudes toward SGM people.

Political affiliation and SGM affiliation together explained nearly half of the variance in beliefs about how providers should care for SGM patients as measured by the GAPS-Beliefs subscale.

Together, sexual minority status, liberal political affiliation, greater spirituality, and greater number of SGM training hours explained slightly more than half of variance in the sample as measured by the GAPS-Behavior subscale.

All eight potential predictor variables included in the Full Model were included in one or more Reduced Models. Political affiliation, religiosity, and SGM affiliation were predictor variables in half of the Reduced Models. Despite the underpowered sample, five of the six Reduced Models explained a statistically significant amount of total variance for their respective criterion variables. This finding was unexpected given the considerably underpowered sample size (n=48). This means that sociodemographic factors, lived experiences, and amount of training in SGM-specific health matter a great deal when it comes to medical student overall preparedness in caring for SGM patients.

Limitations

There were three key limitations in this study: limitations of one of the instruments used to measure respondent attitudes, the small sample size, and the non-representativeness of the sample. First, the ATLPS was found to have significant limitations. Several items on the ATLPS warrant serious examination. The ATLPS is a one-factor tool that provides a continuous score that ranges from 11-55 with higher scores indicating a more positive attitude toward SGM patients. According to Wilson et al. (2014), items 2, 3, 5, 7, 8, and 9 should be reverse coded. However, Wilson et al. (2014) indicate that the item “Healthcare professionals in private practice have a responsibility to treat LGBT patients” and the item “LGBT patients should disclose their LGBT status to their healthcare providers” should be reverse coded. This means that strong agreement with these items would be reverse coded to create a lower score for

these items which would lower the overall score for the scale. A lower score means less affirming attitudes. The face validity of not expecting providers in private practice to care for SGM patients is highly problematic. In addition, respondents could have a variety of reasons for agreeing or disagreeing with the statement that patients should disclose their SGM status to their providers. Thus this item lacks precision. In addition, Sanchez et al. (2006), from whom Wilson et al. (2014) adapt their survey are silent on the specific items that should be reverse coded, simply indicating that items should be reverse coded to yield high scores aligned with more affirming SGM attitudes. In sum, two of the eleven items of the ATPLS appear highly problematic. Fortunately, the attitudes factor was also measured using the LGBT-DOCSS, a scale with greater psychometric rigor than the ATLPS.

Another limitation was the small sample size. However, while the sample size was underpowered and thus at risk for reporting a larger effect size than in a powered sample, the fact that findings were statistically significant indicate that findings are actually stronger than the same result in a larger (powered) sample size (Friston, 2012). So while the findings cannot be assumed generalizable, the findings should be interpreted as valid for the sample studied.

This sample also lacks representativeness, limiting generalizability of findings and making subanalyses impossible. The fact that the sample was overwhelmingly liberal limits the generalizability of results to more diverse populations. Future studies should consider oversampling conservative, male, non-white, and non-Christian medical students to allow for subgroup analyses of political affiliation, sex, race, and religion. Additionally, the external validity of the study is low given the convenience sample

drawn from one academic institution. The voluntary opt-in recruitment approach may have resulted in respondents who were more likely to be interested in SGM health generally.

Finally, it is important to emphasize the exploratory nature of the quantitative strand. While constructs were drawn from the literature, this is the first known study to examine medical student knowledge, attitudes, clinical preparedness, beliefs, and behaviors using validated scales. As such, there was little prior research on which to test predetermined models for their predictive value.

Qualitative Strand

The biggest strength of this mixed methods study was the qualitative strand, which provided contextualized solutions for curriculum leaders seeking to address identified learning gaps in their student population. The qualitative strand answered research question 2: What lessons have champions at other institutions learned about implementing SGM curricular change? This is the first known study to systematically examine contextual factors associated with SGM curricular implementation. By using the CFIR as an implementation framework for the qualitative study, findings contribute to both educational research and implementation science.

To contextualize qualitative findings with past research in the field, findings from this study support past research that has shown the importance of collaboration through stakeholder engagement (Solotke et al., 2017) and the impact of aligning formal and hidden curricula (Hafferty, 1998; Maudsley, 2001; Fallin-Bennett, 2015; Phelan et al., 2017). Collaboration through multi-level engagement of learners, faculty, and leadership was a cross-cutting theme across the curricular continuum from preparation to

implementation. Collaboration ultimately bolstered curricular integration and sustainability of SGM curricula. Institutions that had organizational cultures that valued inclusion and diversity and institutional support for SGM curricular champions were more likely to have leaders that provided resources to SGM curricular champions and more likely to build synergistic initiatives to further align the formal and hidden curricula to support SGM-affirming care.

Content expertise also emerged as critical to what and how SGM content was covered. Content expertise was addressed in a variety of ways—either starting with faculty who felt like experts, building faculty capacity through guidance from external experts, or leveraging expertise from community organizations. The finding of content expertise as a key ingredient to SGM curricular success reinforces the findings of prior studies (Banerjee et al., 2018). Additional key insights from this study include the importance of thoughtful planning and collaboration to build faculty competence in a new topic area and make the curriculum less vulnerable if one faculty member leaves.

While not a theme that emerged organically from interviews, the student investigator asked explicitly about inclusion of intersex curricula based on a hypothesis that this was an understudied area within SGM health. She found that intersex content was nearly universally lacking. Participant 6 said, “No, we don't talk a lot about intersex and what does that mean and, yeah, we just don't.” The two exceptions to not addressing intersex content was having students watch the film *Intersexion* and having a legal discussion as part of a breakout session for an elective all-day student-led forum. In general, participants indicated that they had not given much thought to the intersex population.

Overall, this study provides important evidence for implementation theory. As early as 1987, Ambrose provided a "Recipe for successful change" that included the following essential ingredients: vision, skills, incentive, resources, and action plan (Golden, 2006). If one of these ingredients were missing, the result was confusion, anxiety, gradual change, frustration, or a false start (Golden, 2006). Findings from the qualitative study support Ambrose's conceptual framework of change. Vision from institutional champions to lead change efforts emerged as foundational for SGM curricular change. Content expertise (skills) needed to be identified or developed. In Ambrose's model, lack of incentives led to gradual change, and incentives were identified as needed in the future to expedite SGM curricular change going forward. Resources were identified in the qualitative study as institutional support, usually in the form of protected faculty or staff time. Finally, needs assessment and strategic planning align with Ambrose's call for an action plan for change. Support for Ambrose's theory for organizational change provides important data for future researchers who wish to implement systems-level, organizational changes.

Mixing of Data: Recommendations for GW SMHS

This study was a concurrent mixed methods study. Medical student sociodemographic factors and lived experiences were explored in the quantitative strand to identify independent variables most predictive of SGM-affirming knowledge, attitudes, clinical preparedness, beliefs and behaviors. The qualitative strand concurrently assessed lessons learned from curricular leaders across the U.S. and in one international setting when implementing SGM curricula. These lessons were used to tailor recommendations for GW SMHS based on gaps identified in the quantitative strand. The application of

qualitative data to address quantitative gaps also speaks to the applied, translational nature of the study. The purpose of this work was to identify strategies and solutions that could be operationalized to bolster GW SMHS student preparedness in caring for SGM patients.

This study supports past research that has shown less conservative political affiliation to be associated with more affirming attitudes and beliefs toward SGM patients (Morrison & Morrison, 2011; Norton & Herek, 2013; Ali et al., 2015). This finding begs the question: What are medical schools to do with this information? Specifically, how does political affiliation relate to appropriate medical care for SGM people, and how can medical schools ensure adequate preparation of all students in meeting the needs of their future patients regardless of politics?

Two recommendations, supported by triangulation of the quantitative and qualitative strands of this study, may provide guidance for medical school curriculum leaders. First, exposure to SGM peers, faculty, and patients can influence self-reported clinical preparedness and behaviors. While liberal political affiliation was the strongest individual predictor of SGM-affirming attitudes, beliefs, and behaviors, SGM affiliation (having SGM friends and family members or identifying as a SGM) were meaningful predictors of student knowledge, attitudes, and beliefs. Furthermore, number of SGM training hours was the strongest individual predictor of clinical preparedness and the second strongest individual predictor for SGM-affirming clinical behaviors. These findings suggest that opportunities for SGM training and SGM affiliation could improve SGM-affirming knowledge, attitudes, clinical preparedness, beliefs, and clinical behavior of medical students. These data reinforce findings from Earnshaw et al. (2016) and

Tucker et al. (2016) regarding the positive moderating effect of SGM affiliation on individual attitudes.

Second, there is an opportunity to explore the values and ethics of the medical profession as a way to bridge polarized social attitudes (see Table 16 for qualitative data that supports this recommendation). Medicine is a helping profession with a guiding value to "do no harm." While social and political attitudes may vary widely among health care professionals and students, the principles of patient autonomy, medical and research beneficence, and justice can serve as an ethical framework for bridging sociopolitical divides in order to optimize the health and wellness of patients from diverse lived experiences.

This study documents implementation factors critical to the success of integrating new SGM health curricula in medical, nursing, and pharmacy schools. Specifically, inclusive assessment and planning processes can bolster the success of new curricular efforts. Medical students and faculty can be strategically engaged to identify areas of curricular enhancement and improvement to avoid inadvertently perpetuating SGM stereotypes while effectively using time to prepare students with the knowledge and skills needed to care for future SGM patients. Greater exposure to SGM people and experience working with SGM patients also emerged in the quantitative data as areas of opportunity for curriculum strengthening at GW. Furthermore, greater integration of diversity and curricular efforts at GW could enhance a positive learning environment for diverse (including SGM) students.

Table 16.
Joint Display of Quantitative and Qualitative Findings

Quantitative finding	Recommendation	Qualitative strand quotation
Liberal political affiliation explained a very large amount of variance in more affirming student-reported attitudes (p<0.001, sr^2=.311), beliefs ((p<0.001, sr^2=.141), and clinical behaviors (p<0.001, sr^2=.177) for SGM-affirming care.	Explore shared values to bridge political differences that affect SGM health care	*[A]ll medical schools are required to train people, to treat diverse communities. Okay. That's an overarching value.* (Participant 7)
SGM training hours explained a large amount of variance in student-reported clinical preparedness (p<0.001, sr^2=.158) and clinical behaviors (p=0.001, sr^2=14.1). Specifically, more SGM-specific training was associated with more SGM-affirming clinical preparedness and behaviors.	Optimize student exposure to SGM health content by strategically aligning and layering learning at teachable moments	*The big lesson is it's very easy to implement… We're layering it into an environment where we're already teaching many of those things. So to layer in the idea that there is gender identity development is just not gonna be very time consuming. This isn't like a one week unit on all LGBT issues--and I would even be more extreme: Don't do that. I mean you can do that also and you can certainly do cultural competence and learn terminology and things like that, but in a way this works better isolated out and sitting next to other things that are similar to it.* (Participant 11)
SGM affiliation (self-identification, family, or friends) explained a medium-large amount of variance in student knowledge (p=0.06, sr^2=.071), a small amount of variance in attitudes (p=0.10, sr^2=.028), and a large amount of variance in beliefs (p<0.001, sr^2=.115).	Offer students experiential training with SGM patients	*And then the other barrier is coming up with experiential opportunities because that's the thing that really seals it is when people have an opportunity to take care of real people, well medical trainees have a chance to take care of real people.* (Participant 11)
	Build partnerships with SGM community experts	*[T]here's still so much more we need to teach and so much more we need to learn and that we have to bring in our community experts to work with us.* (Participant 14)

Major insights from the qualitative study that address gaps identified in the quantitative study are presented in the joint display in Table 16. Specific lessons learned can be applied to GW curricula in the following ways:

- SMHS could strategically identify where in the existing curricula content could be supplemented to prepare students for clinical and cultural competence in caring for SGM patients. The 2017 assessment that maps the degree to which SMHS meets AAMC-recommended competencies for SGM health is a great starting point (Pratt-Chapman & Abon, 2019). Learning blocks focused on embryology, neonatal health, human development, adolescent health, human sexuality, mental health, and endocrinology could be examined to identify places where unique health risks and health care needs of SGM should be discussed, especially for transgender and intersex individuals. This approach avoids the pitfall of relying on one or a few champions to carry most or all SGM-related content and models a more system-wide, integrated curricular approach that reinforces learning.
- GW SMHS could develop more opportunities for student self-reflection to identify shared values in treating diverse communities, possibly during professional development (PD) sessions during clinical years. These opportunities could potentially moderate incoming bias of students who have low baseline attitudes, beliefs, and behaviors toward SGM. This may also feel meaningful to students with higher baseline attitudes, beliefs, and behaviors by helping them identify areas for ongoing professional learning.

- GW SMHS could create a student advisory group or a student-faculty task force to provide feedback on unintentional stereotypes presented in case vignettes, standardized patient cases, and faculty role modeling to ensure that the curriculum (both formal and hidden) is not inadvertently reinforcing negative stereotypes of SGM and other minority patients.
- Experiential learning is critical for student learning. GW SMHS could strengthen its existing relationship with Whitman-Walker Health and build on existing community partnerships to expand clinical rotations for students to interact with and care for SGM. SGM-affirming clinical improvements at the GW Hospital and GW Medical Faculty Associates are also important to align the formal and hidden curricula.
- GW SMHS could strengthen the integration of education and diversity efforts by creating an SGM health faculty position to work with the existing Office of Diversity and Inclusion with a charge to optimize SGM student mentoring and to create opportunities for student exposure to SGM diverse in race, religion, and culture. One easy way to supplement existing curricula could be to offer a lunchtime documentary series with discussion on intersectional SGM experiences and the impact of these lived experiences on health.

By acting on the recommendations above, GW SMHS has the opportunity to be a leading medical training program for SGM health preparation by strategically assessing, planning, and evaluating student learning on SGM health. Leading curriculum in SGM health is apropos for an institution located in the heart of the nation's capital, in the geographic area with the highest per capital SGM population in the country

Implications for future research

Additional research in diverse settings with diverse health care professionals is needed to confirm results reported from this study. Researchers can build on the present study by improving the psychometric rigor and availability of scales that measure health professional student clinical preparedness and behaviors. Refinement or replacement of the ATLPS as a gauge of health care professional attitudes about SGM health and health care is of particular concern given significant problems with several items. Development and use of instruments with face validity that are psychometrically tested are critical for future research. This recommendation aligns with the qualitative finding that existing evaluation tools are insufficient in measuring long-term knowledge gains as well as clinical and cultural competence of learners who will care for SGM patients. As theory and research on SGM clinical preparedness grows, confirmatory studies using more sophisticated modeling techniques—such as hierarchical modeling of theory-driven variables and mixed effects models are warranted. Additional approaches to measure implicit bias and longitudinal clinical practices of student learners are also needed. Additional research is also needed to examine the best ways to incentivize inclusion of SGM curricula given diversity of organizational cultures, dependence on individual champions, and differences in leadership support. Future research could compare strategies of integrating SGM curricula in diverse settings and measure longitudinal impact on learner attitudes, beliefs, and clinical behaviors.

Additionally, what constitutes affirming learning environments for SGM health professional students is an area largely uninvestigated. A very recent analysis from the CHANGES study showed that amount of contact with SGM peers was associated with

lower implicit bias of straight medical students while negative faculty role modeling shaped enduring explicit bias in students (Wittlin et al., 2019). Conversely, amount and favorability of contact with SGM individuals in medical school predicted lower levels of explicit bias during residency (Wittlin et al., 2019). In addition to peer influence and faculty role modeling, institutional policies and environmental factors that support SGM student learning should be further explored in future research.

Finally, it is critical for the training of future health care professionals that sexual orientation and gender identity be broadly included in health research to build a strong evidence base from which to draw for clinical care management of SGM patients. Capturing these data in Electronic Health Records and reporting these data to central registries; expanding inclusion of these data on state and national surveys; and requiring these data for federally funded research could rapidly improve the quality and quantity of data informing clinical management of SGM and subsequent opportunities for student and practitioner training in best practices.

Conclusion: Applying Findings to Other Settings

This is the first known study to examine SGM curricular change systematically, as well as to do so using an implementation framework. This approach bolsters the transferability of findings to other settings. School curriculum leaders can replicate this study by analyzing student knowledge, attitudes, clinical preparedness, beliefs, and behaviors in order to tailor curricula to address identified learning gaps.

This study yielded actionable strategies that GW SMHS and other academic health centers can adopt to improve SGM affirming care at their institution. Qualitative findings regarding the importance of institutional support—through protected faculty

time, leadership support, staffing, and financial resources—can be used by curricular champions to advocate within their own settings. Creating an engaged, inclusive process through curricular change was identified in the qualitative strand as important for all phases of curricular expansion and bolstered integration and sustainability of SGM curricular change. The finding that students with more SGM-specific training hours reported more affirming clinical behaviors can also be used by curriculum leaders to recommend enhancements to existing curricula.

Creating a culture of diversity and inclusion is paramount to attenuate documented biases observed in this and other studies. Exploring shared values to attenuate the impact of political views on perceptions of patients could be an important strategy for future curricular leaders. Ensuring a positive learning environment that allows SGM-identifying medical students to be “out” and share their perspectives and finding other ways to increase student exposure to SGM peers, faculty, and patients are additional strategies.

It is the sincere hope of the student author that findings from this study be used by leaders in other health care professional academic settings to optimize student preparedness in caring for SGM and to create learning environments that encourage a pipeline of increasingly diverse students to pursue medicine as a career. Only when the diversity of physicians mirrors the diversity of the patient populations they serve will health equity become a reality.

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APPENDIX A: PRIMARY STUDY CONTROL GROUP SURVEY

NOTE: Items included in secondary analysis: 1, 4-6, 8a-8r, 9a-9k, 10a-o, 11a-o, 16, 18-23

1. What is your **primary** role at GW? (Select ONE)
    a. Staff
    b. Student – Undergraduate
    c. Student of Medicine (Preclinical – M1, M2)
    d. Student of Medicine (Clinical – M3, M4)
    e. Student – Other graduate health professional
    f. Post doc (MD or PhD)
    g. Faculty
    h. Other (please specify): _____

2. What is your **primary** discipline? (Select ONE)
    a. Medicine
    b. Nursing
    c. Physical, speech, or occupational therapy
    d. Public Health
    e. Psychology
    f. Other (please specify): _____

3. What is your age?: ____

Control group: Additional Screening question in RedCap: Did you participate in Improving the Health of LGBTQ+ Populations on November 17, 2018?

a. Yes → Screen out
b. NO → Continue

Some of the following questions may reference LGBTQI people. LGBTQI stands for "lesbian, gay, bisexual, transgender, queer, and intersex." LGBTQI people may also be referred to as "sexual and gender minorities."

Additional Screening question in RedCap: Do you see patients or clients?

a. Yes → Continue with survey
b. NO → Skip #'s 4, 11, and 13

4. In the last six months, roughly how many LGBTQI clients/ patients have you interacted with? ___

5. Please indicate how many hours of content has been required as part of your professional training regarding:
    a. Lesbian, gay, and bisexual patient health ____
    b. Transgender, non-binary gender and/or genderqueer patient health ____
    c. Intersex patient health ____

6. Please indicate how many hours of content you have sought out independent of your required training regarding:
    a. Lesbian, gay, and bisexual patient health ____
    b. Transgender, non-binary gender and/or genderqueer patient health ____
    c. Intersex patient health ____

7. Please indicate the extent to which you agree or disagree with each of the following statements:

	Strongly agree	Agree	Disagree	Strongly Disagree	Not Sure
a. I recognize the unique health challenges of LGBTQI people.					
b. I can describe the contribution of bias to increased health disparities among LGBTQI people.					
c. I can identify and partner with community resources to address the needs of LGBTQI people.					
d. I can describe strategies to enact reform within existing health care institutions to improve care for LGBTQI patients and their loved ones.					
e. I can identify resources for sexual and gender health curricular improvement.					

LGBTQI stands for "lesbian, gay, bisexual, transgender, queer, and intersex." "Cisgender" refers to individuals who are NOT transgender (e.g., someone assigned female sex at birth who identifies as female).

8. Please indicate the extent to which you agree or disagree with the following statements:

	Strongly agree	Agree	Disagree	Strongly Disagree	Not Sure
a. I am aware of institutional barriers that may inhibit transgender people from using health care services.					
b. I am aware of institutional barriers that may inhibit LGB people from using health services.					
c. I think being transgender is a mental disorder.					
d. I would feel unprepared talking with a LGBT client/patient about issues related to their sexual orientation or gender identity.					
e. A same sex relationship between two men or two women is not as strong and committed as one between a man and a woman.					
f. I am aware of research indicating that LGB individuals experience disproportionate levels of health and mental health problems compared to heterosexual individuals.					
g. LGB individuals must be discreet about their sexual orientation around children.					
h. I am aware of research indicating that transgender individuals					

experience disproportionate levels of health and mental health problems compared to cisgender individuals.					
i. When it comes to transgender individuals, I believe they are morally deviant.					
j. I have received adequate clinical training and supervision to work with transgender clients/ patients.					
k. I have received adequate clinical training and supervision to work with lesbian, gay, bisexual (LGB) clients/patients.					
l. The lifestyle of a LGB individual is unnatural or immoral.					
m. I have experience working with LGB clients/patients.					
n. I feel competent to assess a person who is LGB in a therapeutic setting.					
o. I feel competent to assess a person who is transgender in a therapeutic setting.					
p. I have experience working with transgender clients/ patients.					
q. People who dress opposite to their biological sex have a perversion.					
r. I would be morally uncomfortable working with a LGBT client/patient.					
s. Allowing children and teenagers who believe they are transgender to take hormones is wrong.					

t. Allowing adolescents who believe they are transgender to take hormone blockers is wrong.					
u. I would feel prepared talking with straight clients/patients about issues related to their sexual health.					
v. I have received adequate clinical training and supervision to work with intersex patients.					
w. I would feel unprepared talking with an intersex client/patient about issues related to their sexual orientation or gender identity.					

LGBTQI stands for "lesbian, gay, bisexual, transgender, queer, and intersex."
"Cisgender" refers to individuals who are NOT transgender.

9. Please indicate the extent to which you agree or disagree with each of the following statements:

	Strongly agree	Agree	Disagree	Strongly Disagree	Not Sure
a. LGBT patients deserve the same level of quality care from medical institutions as other patients.					
b. LGBT patients should only seek healthcare from gay and lesbian health clinics.					
c. Healthcare professionals in private practice have a responsibility to treat LGBT patients.					
d. I would be comfortable if I became known among my					

professional peers as a health professional that cares for LGBT patients.					
e. I am concerned that if heterosexual patients learned that I was treating LGBT patients, they will no longer seek my care.					
f. I would be comfortable telling my intimate partner that I cared for LGBT patients.					
g. It would be more challenging to gather a history from an LGBT patient than from a heterosexual patient.					
h. It is more challenging to discuss sexual behavior with LGBT patients than with heterosexual patients.					
i. LGBT patients should disclose their LGBT status to their healthcare providers.					
j. Same-sex sexual *attraction* is a natural expression of sexuality in humans.					
k. Same-sex sexual *behavior* is a natural expression of sexuality in humans.					
l. Transgender people are brave to express their true gender.					
m. Intersex patients deserve the same level of quality care from medical institutions as non-intersex patients.					
n. Transgender and gender non-conforming patients deserve the same level of quality care from					

medical institutions as cisgender patients.					
o. Intersex patients should only seek healthcare from intersex-specific health clinics.					
p. Healthcare professionals in private practice have a responsibility to treat LGBTQI patients.					
q. It is more challenging to gather a history from a gay patient than a straight patient.					
r. It is more challenging to gather a history from a transgender patient than from a cisgender patient.					
s. It is more challenging to gather a history from an intersex patient than from a non-intersex patient.					
t. Intersex patients should disclose their intersex status to their healthcare providers.					
u. Transgender patients should disclose their gender identity to their healthcare providers.					

10. Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:

	Strongly agree	Agree	Disagree	Strongly Disagree	Not Sure
a. In their practice with gay/lesbian clients, practitioners should support the diverse makeup of their families.					

b. Practitioners should verbalize respect for the lifestyles of gay/lesbian clients.					
c. Practitioners should make an effort to learn about diversity within the gay/lesbian community.					
d. Practitioners should be knowledgeable about gay/lesbian resources.					
e. Practitioners should educate themselves about gay/lesbian lifestyles.					
f. Practitioners should help gay/lesbian clients develop positive identities as gay/lesbian individuals.					
g. Practitioners should challenge misinformation about gay/lesbian clients.					
h. Practitioners should use professional development opportunities to improve their practice with gay/lesbian clients.					
i. Practitioners should encourage gay/lesbian clients to create networks that support them as gay/lesbian individuals.					
j. Practitioners should be knowledgeable about issues unique to gay/lesbian couples.					
k. Practitioners should acquire knowledge necessary for effective practice with gay/lesbian clients.					
l. Practitioners should work to develop skills necessary for					

effective practice with gay/lesbian clients.					
m. Practitioners should work to develop attitudes necessary for effective practice with gay/lesbian clients.					
n. Practitioners should help clients reduce shame about homosexual feelings.					
o. Discrimination creates problems that gay/lesbian clients may need to address in treatment.					

11. Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:

	Always	Usually	Rarely	Never	Not Sure
a. I help clients reduce shame about homosexual feelings.					
b. I help gay/lesbian clients address problems created by societal prejudice.					
c. I inform clients about gay affirmative resources in the community.					
d. I acknowledge to clients the impact of living in a homophobic society.					
e. I respond to a client's sexual orientation when it is relevant to treatment.					
f. I help gay/lesbian clients overcome religious oppression they have experienced based on their sexual orientation.					

g. I provide interventions that facilitate the safety of gay/lesbian clients.					
h. I verbalize that a sexual orientation for gay, lesbian and bisexual clients is as healthy as a heterosexual orientation.					
i. I demonstrate comfort about gay/lesbian issues to gay/lesbian clients.					
j. I help clients identify their internalized homophobia.					
k. I educate myself about gay/lesbian concerns.					
l. I am open-minded when tailoring treatment for gay/lesbian clients.					
m. I create a climate that allows for voluntary self-identification by gay/lesbian clients.					
n. I discuss sexual orientation in a non-threatening manner with clients.					
o. I facilitate appropriate expression of anger by gay/lesbian clients about oppression they have experienced.					

You are almost done! Some of these questions may feel repetitive, but they are important! Please complete the remainder of the survey.

12. Please indicate the extent to which you agree or disagree with the following statements:

	Strongly agree	Agree	Disagree	Strongly Disagree	Not Sure

a. In their practice with LGBTQI clients, practitioners should support the diverse makeup of their families.					
b. Practitioners should verbalize respect for the lifestyles of gender non-conforming clients.					
c. Practitioners should make an effort to learn about diversity within the LGBTQI community					
d. Practitioners should be knowledgeable about LGBTQI resources.					
e. Practitioners should educate themselves about LGBTQI lifestyles.					
f. Practitioners should help transgender and gender-nonconforming clients develop positive identities as gender non-conforming individuals.					
g. Practitioners should challenge misinformation about transgender clients.					
h. Practitioners should use professional development opportunities to improve their practice with gender non-conforming clients.					
i. Practitioners should encourage LGBTQI clients to create networks that support them as LGBTQI individuals.					
j. Practitioners should be knowledgeable about issues unique to queer couples.					

k. Practitioners should acquire knowledge necessary for effective practice with transgender clients.					
l. Practitioners should work to develop skills necessary for effective practice with transgender clients.					
m. Practitioners should work to develop attitudes necessary for effective practice with transgender clients.					
n. Practitioners should help clients reduce shame about transgender identity.					
o. Practitioners should help clients reduce shame about bisexual feelings.					
p. Discrimination creates problems that transgender clients may need to address in treatment.					

13. Please rate how frequently you engage in each of the behaviors:

	Always	Usually	Rarely	Never	Not Sure
a. I help clients reduce shame about gay/lesbian feelings.					
b. I help clients reduce shame about bisexual feelings.					
c. I help clients reduce shame about transgender or gender non-conforming identity.					
d. I help LGBTQI clients address problems created by societal prejudice.					

e. I inform clients about LGBTQI-affirming resources in the community.					
f. I acknowledge to clients the impact of living in a transphobic society.					
g. I help transgender clients overcome oppression they have experienced based on their gender nonconformity.					
h. I provide interventions that facilitate the safety of transgender clients.					
i. I verbalize that a sexual orientation for bisexual clients is as healthy as a heterosexual / straight orientation.					
j. I verbalize that non-conforming or transgender identity is as healthy as cisgender gender identity.					
k. I demonstrate comfort about transgender issues to transgender clients.					
l. I help clients identify their internalized transphobia.					
m. I educate myself about transgender concerns.					
n. I am open-minded when tailoring treatment for transgender clients.					
o. I create a climate that allows for voluntary self-identification by transgender clients.					
p. I discuss gender identity in anon-threatening manner with clients.					

q. I facilitate appropriate expression of anger by transgender clients about oppression they have experienced.					

14. Please indicate the extent to which you agree or disagree with each of the following statements regarding interprofessional learning:

	Strongly agree	Agree	Disagree	Strongly disagree	Not Sure
a. Shared learning will help me to think positively about other professionals.					
b. Shared learning will help me to understand my own limitations.					
c. Shared learning will help to clarify the nature of patient problems.					
d. Shared learning in training will help me to become a better team worker.					

15. Which categories describe you? *(Select all that apply)*

a. Asian
b. Black or African American
c. Hispanic, Latino, or Spanish origin
d. White
e. Other:_____

f. Prefer not to answer

16. I consider myself to be
    a. Very liberal
    b. Somewhat liberal
    c. Neither liberal or conservative
    d. Somewhat conservative
    e. Very conservative
    f. Apolitical (politics are not important in my life)

17. What is your present religion, if any?
    a. Agnostic
    b. Atheist
    c. Christian: Catholic
    d. Christian: Protestant
    e. Jewish
    f. Muslim
    g. Other:_____
    h. Prefer not to answer

18. I consider myself to be:
    a. Not at all spiritual
    b. Slightly spiritual
    c. Somewhat spiritual
    d. Very spiritual

19. I consider myself to be:
    a. Not at all religious
    b. Slightly religious
    c. Somewhat religious
    d. Very religious

20. Which statement best describes you?
    a. I consider myself part of the LGBTQI community
    b. I have a family member who identifies as LGBTQI
    c. I have a friend who identifies as LGBTQI
    d. I have an acquaintance who identifies as LGBTQI
    e. I do not know anyone who identifies as LGBTQI

21. What sex was listed on your original birth certificate?
    a. Female
    b. Male
    c. Intersex/ X

22. Do you consider yourself
    a. Female
    b. Male
    c. Transgender, non-binary gender or gender nonconforming
    d. Other gender identity (please specify: _____)
    e. Prefer not to answer

23. Do you think of yourself as:
    a. Straight
    b. Bisexual
    c. Lesbian or gay
    d. Other sexual orientation: (please specify:_____)
    e. Prefer not to answer

APPENDIX B: CODEBOOK FOR SECONDARY ANALYSIS

SPSS Name	REDCap Variable	Field Type	Question Text	Response option values	Notes
record_id	record_id	text	Record ID		
Role	Role	radio	What is your primary role at GW?	1, Staff 2, Student - Undergraduate 3, Student of Medicine (Preclinical - M1, M2) 4, Student of Medicine (Clinical - M3, M4) 5, Student - Other graduate health professional 6, Post doc (MD or PhD) 7, Faculty 8, Other	
Role_oth	other_role	text	Other (please specify):		Not used in analysis; just descriptive
Disc	discipline	radio	What is your primary discipline?	1, Medicine 2, Nursing 3, Physical, speech, or occupational therapy 4, Public Health 5, Psychology 6, Other	Not used in analysis
Disc_oth	other_discipline	text	Other (please specify):		Not used in analysis; just descriptive
Age	age	text	What is your age?		
Clinical	screening_patients	radio	Do you see patients	0, No 1, Yes	

Patients	number_of_patients	numeric	In the last six months, roughly how many LGBTQI clients/ patients have you interacted with?		
LGB_Req	lgb_1	numeric	a. Lesbian, gay, and bisexual patient health		Parent Q: "Please indicate how many hours of content has been required as part of your professional trianing regarding:"
Trans_Req	trans_1	numeric	b. Transgender, non-binary gender and/or genderqueer patient health		Parent Q: "Please indicate how many hours of content has been required as part of your professional trianing regarding:"
Inter_Req	intersex_1	numeric	c. Intersex patient health		Parent Q: "Please indicate how many hours of content has been required as part of your professional trianing regarding:"
LGB_Elect	lgb_2	numeric	a. Lesbian, gay, and bisexual patient health		Parent Q: "Please indicate how many hours of content you have sought out independent of your required training regarding: "

Trans_Elect	trans_2	numeric	b. Transgender, non-binary gender and/or genderqueer patient health		Parent Q: "Please indicate how many hours of content you have sought out independent of your required training regarding: "
Inter_Elect	intersex_2	numeric	c. Intersex patient health		Parent Q: "Please indicate how many hours of content you have sought out independent of your required training regarding: "
Asian Black Hispanic White Other Refused	race_eth	Checkbox	Parent Q: Which categories describe you?	1, Asian 2, Black or African American 3, Hispanic, Latino, or Spanish origin 4, White 5, Other 6, Prefer not to answer	Dummy coded for each race/eth for 0, No; 1, Yes
Politics	politics	radio	I consider myself to be:	1, Very liberal 2, Somewhat liberal 3, Neither liberal or conservative 4, Somewhat conservative 5, Very conservative 6, Apolitical (politics are not important in my life)	Dummy Codes 0=1, 2 1=3, 4, 5, 6

Religion	present_religion	radio	What is your present religion, if any?	1, Agnostic 2, Atheist 3, Christian: Catholic 4, Christian: Protestant 5, Jewish 6, Muslim 7, Other 8, Prefer not to answer	Not used in analysis; just descriptive
Rel_Oth	other_religion	text	Other (Please specify):		Not used in analysis; just descriptive
Spirit	spiritual	radio	I consider myself to be:	1, Not at all spiritual 2, Slightly spiritual 3, Somewhat spiritual 4, Very spiritual	Dummy Codes 0=1, 2 1=3, 4
Religiosity	religious	radio	I consider myself to be:	1, Not at all religious 2, Slightly religious 3, Somewhat religious 4, Very religious	Dummy Codes 0=1, 2 1=3, 4
SGMExp	lgbtqi	radio	Which statement best describes you?	1, I consider myself part of the LGBTQI community 2, I have a family member who identifies as LGBTQI 3, I have a friend who identifies as LGBTQI 4, I have an acquaintance who identifies as LGBTQI 5, I do not know anyone who identifies as LGBTQI	Dummy Codes 0=1, 2, 3 1=4,5

Sex	sex	radio	What sex was listed on your original birth certificate?	1, Female 2, Male 3, Intersex/ X	Dummy Codes 0=1 1=2
GI	gender_identity	radio	Do you consider yourself:	1, Female 2, Male 3, Transgender, non-binary gender or gender nonconforming 4, Other gender identity 5, Prefer not to answer	Used to confirm alignment of sex and gender; genderqueer respondent removed for analysis
GI_oth	other_gender_identify	text	Other (please specify):		
SO	sexual_orientation	radio	Do you think of yourself as:	1, Straight 2, Bisexual 3, Lesbian or gay 4, Other sexual orientation 5, Prefer not to answer	Dummy Codes 0=1, 2, 3, 4 1=1
SO_oth	other_sexual_orientation	text	Other (please specify):		
LD1	m2_1	radio	I am aware of institutional barriers that may inhibit transgender people from using health care services.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"

LD2	m2_2	radio	I am aware of institutional barriers that may inhibit LGB people from using health services.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD3	m2_3	radio	I think being transgender is a mental disorder.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD4	m2_4	radio	I would feel unprepared talking with a LGBT client/patient about issues related to their sexual orientation or gender identity.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD5	m2_5	radio	A same sex relationship between two men or two women is not as strong and committed as one between a man and a woman.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"

LD6	m2_6	radio	I am aware of research indicating that LGB individuals experience disproportionate levels of health and mental health problems compared to heterosexual individuals.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD7	m2_7	radio	LGB individuals must be discreet about their sexual orientation around children.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD8	m2_8	radio	I am aware of research indicating that transgender individuals experience disproportionate levels of health and mental health problems compared to cisgender individuals.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD9	m2_9	radio	When it comes to transgender individuals, I believe they are morally deviant.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"

LD10	m2_10	radio	I have received adequate clinical training and supervision to work with transgender clients/patients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD11	m2_11	radio	I have received adequate clinical training and supervision to work with lesbian, gay, bisexual (LGB) clients/patients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD12	m2_12	radio	The lifestyle of a LGB individual is unnatural or immoral.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD13	m2_13	radio	I have experience working with LGB clients/patients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"

LD14	m2_14	radio	I feel competent to assess a person who is LGB in a therapeutic setting.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD15	m2_15	radio	I feel competent to assess a person who is transgender in a therapeutic setting.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD16	m2_16	radio	I have experience working with transgender clients/patients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
LD17	m2_17	radio	People who dress opposite to their biological sex have a perversion.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"

LD18	m2_18	radio	I would be morally uncomfortable working with a LGBT client/patient.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
ATLPS1	m3_1	radio	LGBT patients deserve the same level of quality care from medical institutions as other patients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
ATLPS2	m3_2	radio	LGBT patients should only seek healthcare from gay and lesbian health clinics.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
ATLPS3	m3_3	radio	Healthcare professionals in private practice have a responsibility to treat LGBT patients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"

ATLPS4	m3_4	radio	I would be comfortable if I became known among my professional peers as a health professional that cares for LGBT patients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
ATLPS5	m3_5	radio	I am concerned that if heterosexual patients learned that I was treating LGBT patients, they will no longer seek my care.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
ATLPS6	m3_6	radio	I would be comfortable telling my intimate partner that I cared for LGBT patients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
ATLPS7	m3_7	radio	It would be more challenging to gather a history from an LGBT patient than from a heterosexual patient.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"

ATLPS8	m3_8	radio	It is more challenging to discuss sexual behavior with LGBT patients than with heterosexual patients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
ATLPS9	m3_9	radio	LGBT patients should disclose their LGBT status to their healthcare providers.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
ATLPS10	m3_10	radio	Same-sex sexual attraction is a natural expression of sexuality in humans.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"
ATLPS11	m3_11	radio	Same-sex sexual behavior is a natural expression of sexuality in humans.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each of the following statements:"

GAP1	m4_1	radio	In their practice with gay/lesbian clients, practitioners should support the diverse makeup of their families.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP2	m4_2	radio	Practitioners should verbalize respect for the lifestyles of gay/lesbian clients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP3	m4_3	radio	Practitioners should make an effort to learn about diversity within the gay/lesbian community.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"

GAP4	m4_4	radio	Practitioners should be knowledgeable about gay/lesbian resources.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP5	m4_5	radio	Practitioners should educate themselves about gay/lesbian lifestyles.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP6	m4_6	radio	Practitioners should help gay/lesbian clients develop positive identities as gay/lesbian individuals.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"

GAP7	m4_7	radio	Practitioners should challenge misinformation about gay/lesbian clients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP8	m4_8	radio	Practitioners should use professional development opportunities to improve their practice with gay/lesbian clients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP9	m4_9	radio	Practitioners should encourage gay/lesbian clients to create networks that support them as gay/lesbian individuals.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"

GAP10	m4_10	radio	Practitioners should be knowledgeable about issues unique to gay/lesbian couples.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP11	m4_11	radio	Practitioners should acquire knowledge necessary for effective practice with gay/lesbian clients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP12	m4_12	radio	Practitioners should work to develop skills necessary for effective practice with gay/lesbian clients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"

GAP13	m4_13	radio	Practitioners should work to develop attitudes necessary for effective practice with gay/lesbian clients.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP14	m4_14	radio	Practitioners should help clients reduce shame about homosexual feelings.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"
GAP15	m4_15	radio	Discrimination creates problems that gay/lesbian clients may need to address in treatment.	5, Strongly agree 4, Agree 2, Disagree 1, Strongly disagree 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please indicate the extent to which you agree or disagree with each statement about treatment with gay and lesbian clients on the basis of the following scale:"

GAP16	m5_1	radio	I help clients reduce shame about homosexual feelings.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP17	m5_2	radio	I help gay/lesbian clients address problems created by societal prejudice.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP18	m5_3	radio	I inform clients about gay affirmative resources in the community.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP19	m5_4	radio	I acknowledge to clients the impact of living in a homophobic society.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"

GAP20	m5_5	radio	I respond to a client's sexual orientation when it is relevant to treatment.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP21	m5_6	radio	I help gay/lesbian clients overcome religious oppression they have experienced based on their sexual orientation.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP22	m5_7	radio	I provide interventions that facilitate the safety of gay/lesbian clients.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP23	m5_8	radio	I verbalize that a sexual orientation for gay, lesbian and bisexual clients is as healthy as a heterosexual orientation.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"

GAP24	m5_9	radio	I demonstrate comfort about gay/lesbian issues to gay/lesbian clients.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP25	m5_10	radio	I help clients identify their internalized homophobia.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP26	m5_11	radio	I educate myself about gay/lesbian concerns.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP27	m5_12	radio	I am open-minded when tailoring treatment for gay/lesbian clients.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"

GAP28	m5_13	radio	I create a climate that allows for voluntary self-identification by gay/lesbian clients.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP29	m5_14	radio	I discuss sexual orientation in a non-threatening manner with clients.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"
GAP30	m5_15	radio	I facilitate appropriate expression of anger by gay/lesbian clients about oppression they have experienced.	5, Always 4, Usually 2, Rarely 1, Never 3, Not sure 777, Not applicable 999, Missing	Parent Q: "Please rate how frequently you engage in each of the behaviors with gay and lesbian clients on the basis of the following scale:"

APPENDIX C: PRIOR INTERVENTIONS AND POTENTIAL INTERVIEWEES

Academic setting	Relevant studies	Interviewee	Control/ comparison group?	Validated scale?	Individual or Systems level?	Considerations (i.e., unique design or reason for exclusion)
Boonshoft School of Medicine, Wright State University	Cooper, Chacko, & Christner (2017)	M. Brett Cooper, MD	No	No	Individual	
Boston University School of Medicine	Safer & Pearce (2013); Thomas & Safer (2015); Erikkson and Safer (2016); Park & Safer (2018)	Joshua Safer, MD	No (2013) No (2015) No (2016) No (2018)	No (2013) No (2015) No (2016) No (2018)	Individual	
Case Western University School of Medicine	Mehringer et al. (2013) Grosz et al. (2017)	Todd Fennimore, MPA Kathy Cole-Kelly, MS, MSSW	No (2013) No (2017)	No (2013) No (2017)	Individual	
Columbia University	Grubb et al. (2013)	Jeremy Kidd, MD, MPH	No (2013) No (2016)	No (2013) No (2016)?	Individual	Grubb: Excluded. Results not reported

	Kidd et al. (2016)					Kidd: One of few longitudinal designs; 90-day follow up showed return to baseline scores.
Hunter College of the City University of New York	Bidell (2013)	Markus Bidell, PhD	Yes	Yes	Individual	
Johns Hopkins School of Medicine	Bakhai et al. (2016)	Errol Fields, MD, MPH, PhD	No	No	Individual	
May Medical School, Rochester, MN	Johnson, Rullo, and Faubion (2015)	Stephanie Faubion, MD	No	No	Individual	One of few longitudinal designs; 30-day follow showed retention of knowledge gains posttest.
Northwestern University Feinberg School of Medicine	Gacita, et al. (2018)	Anthony Gacita	No	No	Individual	
San Diego State University	Calzo et al. (2017)	Joel Calzo, PhD	No	No	Individual	
School of Nursing, San Francisco State University	Carabez et al. (2015)	N/A	No	N/A	N/A	Excluded. Focus is on themes from

						practitioners, not student learning.
University of Bristol (United Kingdom)	Taylor, Condry & Cahill (2017)	David Cahill, MD Anna Taylor, MD	No	No	Individual	
University of California Davis School of Medicine	Ton et al. (2016)	Hendry Ton, MS, MD	No	N/A	Systems	
University of California San Diego School of Medicine	Hernandez, et al. (2015)	Nancy Graff, MD Ramon Hernandez, MPH	No	No	Individual	
University of California, San Francisco	Rowniak and Selix (2016)	N/A	No	N/A	Individual	Excluded. No formal assessment conducted.
University of California, San Francisco	Braun et al. (2017b and 2017c) Vance et al. (2017)	Marcus Ferrone, PharmD Hannan Braun, MD	No (Braun) No (Vance)	No (Braun) No (Vance)	Individual (Braun) Individual (Vance)	
University of Connecticut School	Maruca et al. (2018)	Annette Maruca, PhD	No	Yes: Gay Affirming	Individual	

of Nursing & University of Central Florida College of Nursing		Desiree Diaz, PhD		Practice Scale (Crisp, 2006)		
University of Illinois at Chicago, School of Nursing	Yingling, Cotler and Hughes (2017)	N/A	No	No	Individual	Excluded. No formal evaluation conducted.
University of Louisville, Kentucky	Neff & Kingery (2016); Holthouser et al. (2017); Leslie (2017), Leslie (2018), Noonan et al. (2018), Sawning et al. (2018)	Amy Holthouser, MD Katie Leslie, PhD Susan Sawning, MSSW	N/o (2016) N/A (Holthouser, 2017) Yes (Leslie, 2017, 2018) N/A (Noonan, 2018) No (Sawning, 2018)	N/o (2016) N/A (Holthouser, 2017) Yes (Leslie, 2017, 2018, IAT) N/A (Noonan, 2018) No (Sawning, 2018)	Individual and Systems	Holthouser (2017) and Leslie (2018) describe the innovation and outcomes of the innovation. Neff and Kingery (2016) and Sawning (2018) are components of the larger systems-level work. Noonan (2018) is formative work.
University of Pennsylvania Perelman Schools of Medicine, Nursing, and Dentistry	Dowshen et al. (2013) and (2016) Yehia et al. (2015)	Nadia Dowshen, MD	Yes (2013) No (2016) N/A (2015)	No (2013) N/A (2016) N/A (2015)	Individual (2013) Systems (2016?) Systems (2015)	

University of Pittsburg School of Medicine	Gelman et al. (2014)	Carla Spagnoletti, MD	No	No	Individual	
University of Wisconsin-Oshkosh, School of Nursing	McNiel and Elertson (2017)	Paula L. McNiel, DNP, APHN-BC Kathleen M. Elertson, DNP, APNP, CPNP-PC, FNP-BC	No	No	Individual	
Vanderbilt University School of Medicine	Sullivan et al. (2013)	William Sullivan, MD	No	No	Individual	
Wegman's School of Pharmacy, Rochester, New York	Parkhill et al. (2014)	Amy Parkhill, PhD	No	No	Individual	
Wesleyan University	Strong & Folse (2015)	Victoria Folse, PhD, APN Kristy Strong, BSN, RN	No	Yes: Attitudes toward Lesbians and Gay Men Scale	Individual	
Yale University School of Medicine	Solotke et al. (2017)	N/A	N/A	N/A	Systems	Excluded. Not a study. Perspective piece.

APPENDIX D: INFORMATION SHEET FOR INTERVIEWEES

IRB # _____

You are invited to participate in a research study to help advance health professional student preparedness in caring for lesbian, gay, bisexual, transgender, queer, and intersex (LGBTQI) patients. Your participation is greatly appreciated.

Study Title: Implementing Sexual and Gender Minority Health Curricular Changes in Academic Medicine

Principal Investigator: Leslie Davidson, PhD, ldavidson@email.gwu.edu, ph (202) 994-1623

Student Investigator: Mandi Pratt-Chapman, mandi@gwu.edu, 202-994-5502

What is this study about?

- The purposes of the mixed methods study is to 1) identify gaps in preparedness of GW health professional students, 2) identify lessons learned from faculty at other universities who have implemented health curricular changes to improve health profession student preparedness to care for lesbian, gay, bisexual, transgender, queer and intersex (LGBTQI) patients, and 3) use lessons learned from faculty to improve the curriculum at GW health professional schools. The part of the study you are asked to be involved in is the qualitative component (i.e., interviews).

What do I have to do to participate?

- Taking part in this study is completely voluntary.
- You will be asked to participate in an interview that will last about 60 minutes.
- Your willingness to participate is implied if you agree to be interviewed.

Will this study benefit me?

- You will not benefit individually from this research.

How many people will participate?

- Approximately 12 individuals will be interviewed.

What are the risks of participating in this study?

- Risks of research participation are hard to predict.
- You may feel uncomfortable answering certain questions.

- The biggest risk to you is the possibility that someone will connect your responses to you or know you are participating in the study. This is called loss of confidentiality. This is possible, since there are few faculty who have conducted educational interventions to improve health professional student preparedness to care for LGBTQI people. However, the questions you will be asked involve your professional role and organizational context, so the risks of being identified are relatively small.

What can I do to reduce my risks?

- You do not need to sign this information sheet.
- You do not need to answer any questions that make you feel uncomfortable and you may discontinue participation at any time.

What is the research team doing to reduce my risks?

- Your name will be replaced with a description such as "Female respondent, Associate Professor, Nursing School."
- Only the study team will have access to data and files. All data and files will be password protected and stored on a secure server.

Do I have to answer every question?

- You do not have to answer any question that you do not want to answer.

Who will have access to the information I share?

- Themes will be identified from the interviews and shared in a dissertation report, future professional presentations, publications, and to curriculum committees and leaders at GW health professional schools.

What if I change my mind and don't want to participate?

- You do not have to participate.

Who do I contact if I have questions?

The Office of Human Research at the George Washington University can provide more information about your rights as a study participant at (202) 994-2715. If you have any questions or concerns at any time before, during or after the study—including if you feel you have been hurt by the study—contact Mandi Pratt-Chapman at (202) 994-5502. You may also reach out to her after the study to find out about study results.

You may wish to save this form, so you can look back at it in the future.

APPENDIX E: INTERVIEW GUIDE

[OPENING]

Thank you for taking the time to do this interview with me.

I sent you the information sheet about the study prior to our call. You should keep a copy in case you want to refer back to it at any time. I just want to take a moment to remind you of some of the important points from that document to make sure that we only move forward if you understand and still want to participate.

I am going to ask you questions about your experiences in implementing a learning intervention for health professional students to improve their preparedness in caring for lesbian, gay, bisexual, transgender, queer, and intersex patients. I might refer to this population as LGBTQI or as sexual and gender minorities or SGM. The purpose of my study is to understand any organizational factors or external factors that may have influenced your work and to seek your advice for future faculty implementing similar learning interventions based on what you have learned. I'm anticipating this will take about 60 minutes. Your participation is voluntary. If you decide not to participate it will not negatively impact you in any way. You can stop the interview at any point if you do not want to continue. Or, if you do not feel comfortable answering a particular question that I ask, just let me know and we can skip it.

I'll be recording our conversation today. Everything you say today is confidential. This means the recording and transcript are not shared with anyone outside of the research team in a way that identifies you. If I use quotations from this interview in anything public, your name will not be associated with the quotation and the quotation

will not say anything that could help someone know your identity. I do want to mention that there are relatively few studies on this topic, so it is possible that you could be identified by something that you say, but I will not directly identify you and I will share with you my findings after I do all of my interviews. I want to know if I missed something or misunderstood any of your responses. If you are uncomfortable about anything I quote, you have the right to ask me to redact your statement, and I will do so.

Do you have any questions about the information sheet I sent to you or about anything else about the study before we get started?

There are no right or wrong answers in today's interview and I really just want your honest opinion and viewpoints when answering questions.

I will be respectful of your time and be sure to keep our conversation within an hour, since you agreed to a 60-minute interview.

Do you have any questions before I start the recording?

[BEGIN RECORDING]

Do you still agree to participate in this interview?

Do you still agree that it is okay to record this interview?

[ONLY PROCEED WITH INTERVIEW IF INTERVIEWEE ASSENTS]

[INTERVIEW QUESTIONS]

1. How did you begin your work in addressing sexual and gender minority health at your institution?
    a. Did any outside recommendations influence you in addressing sexual and gender minority health at your institution?
    b. Did student interest play any part in addressing sexual and gender minority health gaps at your institution?
2. Can you speak to specifics as to how you decided on the content of your learning intervention?
3. How did the learning intervention you implemented reflect your initial vision?
    a. How did the learning intervention change from what you originally envisioned?
4. What lessons did you learn through implementing your sexual and gender minority health curriculum?
5. Since you wrote your paper in [insert journal/date of publication], tell me what has happened with the program/ learning intervention?
    a. What contributed to its
        i. Success?
        ii. Expansion?
        iii. Shutting down?
6. Can you speak about any external factors, such as policies, incentives or competition that influenced your curricular implementation?

   a. Can you tell me about how these factors specifically influenced your project?

7. Can you tell me about any internal factors that influenced your curriculum implementation?
   a. Can you tell me about how these factors specifically influenced your project?
8. Tell me about the culture at your institution – how does that influence your work?
   a. Was there anything about the culture of the university at the time you implemented your sexual and gender minority health curriculum that influenced your project implementation?
   b. Has the culture changed since you introduced this new content to the curriculum?
9. Do you feel like your organization was ready for incorporating sexual and gender minority health content for health professional students at the time of your learning intervention? Has the readiness changed since you introduced this new content?
10. Is there anything you would like to share that we haven't talked about?
11. Is there anyone else you suggest I interview on this topic?

[CLOSING]

Just a reminder that I will be writing up what we discussed today. I'll replace your name with a number so you are not identified personally.

Do I have permission to contact you after this interview? I would like to share what I write up with you, so you can check and make sure that everything I write up

makes sense and was what you meant to convey. Feel free to reach out if you have questions in the meantime.

Do I have permission to contact you if I have other questions?

If you have any questions later, you can also contact me. My information is on the information sheet you received. Thank you, and have a great day!

APPENDIX F: CODEBOOK FOR QUALITATIVE STRAND

Name	Description	Files	References
1 Foundational context	The landscape within which the SGM curriculum is introduced. Includes both outer setting and inner setting from the CFIR.	16	352
Champions	There are champions for SGM health.	16	114
Empowered	Feels like they are in a position that can impact change in curriculum.	11	22
Motivated	Motivated to action to advance SGM health curricula.	14	66
Addressing learning gap in own professional training	Wants to remedy lack of SGM content they received in their own training.	3	7
Belief that all people deserve access to quality healthcare	Belief that SGM are not getting good health care motivates action.	5	6
Experience of discrimination	Personal experience of discrimination as part of the SGM community motivates action.	2	3
Hearing others' narratives	Sees or learns of discriminatory health care experiences and wants that to change.	4	9

Name	Description	Files	References
Inner setting	One of 5 key domains of the CFIR.	16	136
Culture	Parent node to house more granular cultural characteristics of academic settings.	16	108
Organizational readiness	The degree to which the institution was ready for SGM content to be included in the curriculum.	15	74
Relative priority	The degree to which SGM health is a priority compared to other topics in the curriculum.	6	23
Impacted curriculum	The sense that "we are just trying to cover the basics"--there is no room to do more content.	3	5
Volunteerism	The expectation of volunteers to lead SGM content.	2	5
Worry about backlash	Degree to which institution is worried about community backlash for including SGM curricular content.	1	3
Values	Overarching node for more granular institutional values.	11	28
Serving the underserved	The institution is mission-oriented to serve those who are vulnerable, for religious or other reasons.	3	4
Valuing inclusion	The institution prides itself as valuing diversity.	7	10

Name	Description	Files	References
Institutional commitment	Level of commitment the institution shows to supporting SGM curricula.	9	28
Leadership support	Leaders actively facilitate SGM curricula by providing resources, visibility or other supports.	5	7
Money	Budget is allocated to support SGM health curricula.	3	6
Protected faculty time	Faculty and/or administrative leadership time is protected to advance SGM health curricula.	3	4
Staff support	Staff are hired or designated to support SGM health curricula and/or creation of an inclusive environment for SGM.	4	7
Outer setting	One of 5 key domains of the CFIR.	15	102
Guidance from credible sources	Guidelines, recommendations, or other guidance from professional membership organizations, government, research literature, or other sources.	15	56
Socio-political climate	The social and political environment around introduction of SGM curriculum.	9	46
2 Preparation	Includes preparation, including needs assessment and strategic planning for the SGM curricular change.	16	233

Name	Description	Files	References
Assessing need	Conducting a needs assessment to identify learning gaps and needs.	9	41
Showing the necessity for the content	Use data and/or feedback to show why SGM health content coverage is important.	8	20
Contingencies	Challenges or opportunities experienced when introducing SGM health content into the curriculum.	11	64
Curriculum revision (challenge and opportunity)	The curriculum is already undergoing revision for updates.	6	16
Time constraints (challenge and opportunity)	Limited time in the curriculum, especially for schools that have shortened preclinical hours.	6	10
Plan strategically to reinforce learning	Think systematically and strategically about what, where, and how content should be included to optimize learning.	13	87
Committees	Use of committees to push work forward: curriculum committees, working committees, etc.	4	7
Responding to opposing views	Thinking through how to respond to negative responses after implementing SGM content.	7	38

Name	Description	Files	References
Conservative resistance	Responding to conservative resistance to SGM curricular content.	4	8
Time constraints	Responding to time constraints as a reason not to include SGM content.	3	11
3 Implementation	Includes the factors involved in implementing curricular change, including content of the curriculum and how the content is rolled out. Partially incorporates intervention characteristics and process domains from the CFIR.	16	259
Be intentional about inclusivity	Look for shared values and do it respectfully.	7	19
Content	How content was decided upon and what was included.	16	210
Based on external expertise	Relying on external experts to identify content and format of training.	5	14
Based on faculty expertise	Content based on what faculty felt comfortable and trained to teach.	7	20
Bias training	Implicit bias training.	4	10
Contact with SGM	Interaction with SGM people (e.g. on panels, standardized patients, etc.)	9	38

Name	Description	Files	References
Level of integration	Degree to which curriculum is consider core or fringe.	12	69
Experiential learning	It is not enough to lecture; students need to be apprenticed to learn how to care for SGM appropriately.	4	13
4 Sustainability	Degree to which SGM curriculum will be sustained over time.	16	215
Alignment of hidden and formal curriculum	How culture has changed at the institution since starting to address SGM health in the curriculum.	15	87
Collaboration through multi-level engagement	Inclusion of key people in the process of SGM curricular change.	16	96
Looking ahead	Future directions for the field to enhance SGM curriculum integration in health professional schools.	9	32
Incentivize inclusion of SGM curricula	Provide incentives for inclusion of SGM curricula in medical schools.	6	20
Need for evaluation tools	Need for psychometrically sound evaluation tools to measure learning outcomes.	6	10
Need for SGM research	Need for ongoing research to improve evidence base.	2	2
Need for intersex content	Need for intersex content in health curricula.	8	16