

Sexual and gender minority health: a roadmap for developing evidence-based medical school curricula

Santé des minorités sexuelles et de genre : feuille de route pour l'élaboration de programmes d'études médicales fondés sur des données probantes

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Abstract

Background: Educating future physicians about sexual and gender minority (SGM) patients and their health care needs is an important way to mitigate discrimination and health disparities faced by this community. Canada, across its 17 medical schools, lacks a national standard for teaching this essential topic. This paper aims to review the best practices for teaching an SGM curriculum in undergraduate medical education and synthesize this information into actionable propositions for curriculum development.

Methods: A scoping literature review was conducted to identify best practices for SGM teaching. The review elicited peer-reviewed and grey literature on best practices for SGM teaching, policy documents, and opinion pieces from medical education authorities and SGM advocacy groups. Through an iterative process with all authors, the Canadian Queer Medical Students Association (CQMSA), and the Association of Faculties of Medicine of Canada (AFMC), a set of propositions was developed.

Results: The search yielded 1347 papers, of which 89 were kept for data extraction. The main outcomes of these papers were sorted along five repeating themes, which formed the basis for six propositions; two more propositions were then added after discussion with all authors.

Conclusion: We present eight propositions for the development of a national standard for SGM education at the undergraduate medical level. These include standardizing learning objectives across all schools, using established curricular models to guide curriculum development, interweaving concepts across all levels of training, diversifying teaching modalities, providing faculty training, ensuring a safe space for SGM students and faculty, using OSCEs as a teaching tool, and involving the local SGM community in curriculum development and delivery.

Résumé

Introduction: La formation des futurs médecins sur les patients issus des minorités sexuelles et de genre (MSG) et sur leurs besoins en matière de soins de santé est un moyen important d'atténuer la discrimination et les disparités en matière de santé auxquelles est confrontée cette communauté. Le Canada, avec ses 17 écoles de médecine, ne dispose pas d'une norme nationale pour l'enseignement de ce sujet essentiel dans l'ensemble de ses 17 écoles de médecine. Cet article vise à passer en revue les meilleures pratiques pour l'enseignement d'un programme SGM dans la formation médicale de premier cycle et à synthétiser ces informations sous forme de propositions concrètes pour le développement d'un programme d'études.

Méthodes: Un examen de la portée de la littérature a été mené pour identifier les meilleures pratiques en matière d'enseignement en SCMSG. L'étude a permis d'obtenir de la documentation évaluée par des pairs et de la documentation grise, des documents de politique et des articles d'opinion provenant des autorités en matière d'éducation médicale et des groupes de défense de la SCMSG. Un ensemble de lignes directrices a été élaboré dans le cadre d'un processus itératif auquel ont participé tous les auteurs, l'Association des étudiant-es 2ELGBTQ+ en médecine (ACÉQM) et l'Association des facultés de médecine du Canada (AFMC).

Résultats : La recherche a trouvé 1 347 articles, dont 89 ont été retenus pour l'extraction des données. Les principaux résultats des articles ont été classés selon cinq thèmes récurrents, qui ont servi de base à six recommandations ; deux autres recommandations ont ensuite été ajoutées après discussion entre les auteurs.

Conclusion : Nous présentons huit propositions pour le développement d'une norme nationale pour l'enseignement de la SCMSG au sein des programmes de premier cycle de médecine. Il s'agit notamment de normaliser les objectifs d'apprentissage dans toutes les facultés, d'utiliser des modèles établis pour guider l'élaboration des programmes, d'imbriquer les concepts à tous les niveaux de la formation, de diversifier les modalités d'enseignement, d'assurer la formation du corps enseignant, de garantir un espace sûr pour les étudiants et le corps enseignant, d'utiliser les ECOS comme outil d'enseignement et d'impliquer la communauté 2ELGBTQ+ locale dans l'élaboration et la mise en œuvre des programmes d'enseignement.

Introduction

The marginalisation and discrimination faced by sexual and gender minority (SGM) individuals contribute to significant health disparities. The term sexual minority (SM) refers to individuals whose sexual orientation differs from the norm, that is, heterosexuality. This includes people who identify as gay, lesbian, bisexual, pansexual, asexual and many others. Similarly, the term gender minority (GM) refers to individuals whose gender identity or expression is different than the one they were assigned at birth, or people whose gender identity or expression exists outside of a gender binary, such as people who identify as transgender, gender non-binary, gender fluid, agender and many others. The House of Commons Standing Committee on Health released a report in 2019 showing that SGM individuals are four times more likely to attempt suicide and have higher rates of cardiovascular disease, respiratory disease, and arthritis than their heterosexual, cisgender counterparts.¹ A largely accepted way to improve health outcomes for SGM communities is to decrease stigmatization of these communities within medicine, and this should start with educating medical students.¹⁻³ Early and repeated engagement with SGM-related health topics improves retention and reduces stigma and bias towards these groups.^{4,5} Further, medical students desire training that prepares them to care for patients from broad backgrounds.⁶ A 2022 cross-sectional study demonstrated that medical students exhibit a relatively “high degree of personal comfort in caring for transgender patients but lack the knowledge and skills to confidently care for them”². Medical students want to learn more about SGM health than what is offered by current curricula, which seek to teach cultural competence but do not include medical knowledge or concrete skills.

The landscape of SGM education in medical schools in Canada is varied, and no standardised set of competencies exists that medical students should attain to properly address LGBTQ+ health and healthcare disparities.⁶ In a survey of practising physicians in Winnipeg, instances of LGBTQ+ learning encounters varied between none to one day per year throughout their training⁶ Despite the lack of national standardisation in SGM education, ongoing calls for increased SGM education and representation have manifested haphazardly across the country.⁶⁻⁹ In some cases, anti-SGM discrimination and heterosexism have been identified alongside a paucity of SGM education in Canadian medical school.¹⁰

Limitations in Canadian SGM curricula around transgender care are a particular area of concern. A qualitative study of physician knowledge about transgender health in Manitoba found significant disparities, reflecting poor representation of this community in local medical education.⁶ These knowledge deficits included a lack of physician comfort in providing hormone therapy and care for patients who were transitioning, as well as a general lack of knowledge about the health needs of Trans patients. These disparities resulted in unnecessary referrals, increased wait times, decreased access to care, and a lack of appropriate screening for relevant health issues such as gynecologic malignancies and pregnancies for transgender men.⁶ Sexual minority (SM) and gender minority (GM) populations face unique and varied challenges with minimal overlap. These two groups are often conflated due to hetero- and cis-normative medical framing that has historically grouped them together. Teaching medical students about these two distinct communities under one umbrella is a disservice to students and SM and GM patients; however, most medical schools in Canada do not make this distinction in their curriculum.⁷

The current framework for Canadian medical education presents an opportunity to integrate these needs into a competency-based curriculum. Adequate fulfilment of the Medical Expert and Health Advocate CanMEDS roles especially should include SGM-specific requirements. The Medical Council of Canada (MCC) examination objectives state that medical graduates should be able to “provide gender-affirming health care to people of diverse sexual orientations and gender identities” and “create and maintain a welcoming and affirming environment for 2SLGBTQIA+ people.”¹¹ However, these objectives lack specificity and provide little guidance for curricular designers, and often go unmet among physicians who lack training in caring for SGM individuals.¹² A set of specific competencies regarding SGM communities is warranted to highlight the importance of SGM education¹³ and existing discrepancies. This change would align with key concepts of the Health Advocate role, specifically those of health equity and continuous quality improvement.¹⁴

The Canadian Queer Medical Students’ Association (CQMSA) conducted a broad review of the literature as a response to the lack of a national standard for the content and quality of SGM curricula across the country. We aimed to describe best or most effective practices for teaching this content at an undergraduate medical level, and, in consultation with various stakeholders and using our own

lived experience, propose suggestions for implementing these teaching practices in Canada. With consultation from the Association of Faculties of Medicine of Canada (AFMC), and our own lived experience, we created a set of eight propositions for developing curriculum. This paper reports our methodology and lays out these propositions. It is an abridged version of the more complete report the CQMSA developed for future dissemination to various curricular authorities across Canada.

Methods

Literature search and screening

We used a comprehensive search strategy to retrieve journal articles and grey literature. Search terms used are outlined in Table 1. We used the Boolean operators “OR” and “AND” to combine terms as needed to search PubMed, Embase, and Medline. Authors manually searched references of retrieved review articles. We constructed a Google Programmable Search Engine using the filters and URLs in Table 1 to search for grey literature using these same key words; these URLs represent well-known LGBTQ+ advocacy organizations and Canadian medical education organizations who may have released position papers. The electronic search was restricted from August 2011 to March 2024. We excluded duplicate publications. We catalogued all retrieved articles in Zotero (Zotero Citation Software, Corporation for Digital Scholarship, Vienna, VA, USA) and subsequently imported them into COVIDENCE (Covidence systematic review software, Veritas Health Innovation, Melbourne, Australia.) for screening and evaluation. Two authors, SG and CG, systematically applied inclusion and exclusion criteria as outlined in Table 1, first on titles and abstracts, then on full text. NK resolved disagreements between them.

Data extraction

We used Covidence for data extraction employing a previously developed data extraction form (Appendix A). This form was designed through consensus discussion by all authors to include all information pertinent to the development and use of best practices for SGM education which can be found in Appendix A. Two researchers independently completed data extraction on for each article, with adjudication by a third. Given the objective this review was to obtain an overall assessment of current best practices to help inform a set of propositions applicable to a Canadian context, and not the evaluation of these best practices, we did not perform a risk of bias assessment.

Table 1. Search strategy

	Population	Intervention	Outcome
Key concepts	Medical Learners	LGBTQ	Best practices
		Curriculum	
Synonyms/ Abbreviations	Medical students	2SLGBTQ+	Recommendations
	UGME	Content	Standards
	Undergraduate medical education	Lesbian, Gay, Bisexual, Transgender, Queer	Accreditation
	Medical trainees	Two spirit	Curriculum goals
	Pre-clerkship	LGBTQIA	Content recommendations
	Clerkship	Education	Gold standard for education
	Medical school	Teaching	
	Doctor of medicine students	Classes	
		LGBT	
	LGBTQQIA+		
Filters	English, published in the last 10 years		
Databases	PubMed, Embase, Medline		
Programmable Search Engine Included URLs	gladd.co.uk, lgbtiaheatheducation.org, egale.ca, cpath.ca, actioncanadashr.org, fenwayhealth.org, callen-lorde.org, gmhc.org, community.pflag.org, acog.org, aafp.org, plannedparenthood.org, interacadvocates.org, cancer-network.org, aglp.org, rainbow-project.org, lgbtiqhealth.org.au, wpath.org, glma.org, cfms.org, cma.org, amsa.org, aamc.org		
Inclusion Criteria	At least one population included in the paper should be undergraduate medical education Paper should address 2SLGBTQIA+ education Must include best practices pertaining to curriculum development and/or education Papers must be available in English		
Exclusion Criteria	Paper published more than 10 years ago Paper unavailable in English Paper only includes non-medical curriculum (including nursing, dentistry, pharmacy, and physician assistant curriculum) Full text article is not accessible Paper does not meet the inclusion criteria		

Data analysis

We used an iterative process for data analysis performed by all authors. We all have lived experience as SGM medical students and advocates for improved SGM education in undergraduate medicine. NK categorized papers as either curricular examples or position statements plus existing guidelines. We further sub-grouped outcomes, best practices, or recommendations from each paper along common themes, which naturally emerged through an iterative review of data. Each paper could be grouped into more than one theme. We used data from other fields to contextualize these best practices. We also held discussions internally and with the 2SLGBTQ+ sub-committee of the AFMC’s EDI committee, who provided

further insight into curricular design and helped to refine our proposal. The authors are all current or recently graduated queer Canadian medical students who have spent several years involved in 2SLGBTQ+ advocacy. This is a diverse group of individuals representing various sexual and gender identities, who have experienced medical education from multiple different institutions and shared lived experience with these varied curricula throughout the process of developing the below propositions. Similarly, the 2SLGBTQ+ sub-committee of the AFMC's EDI committee are a group of diverse educators who are committed to advocating for 2SLGBTQ+ patients and medical students and have shared their lived experience teaching these topics across the country. Therefore, the results of this review are informed by both literature and our collective lived experience.

Ethics statement

No human participants were used in this study. Ethics approval was not pursued.

Results & Discussion

The search strategy yielded 1667 papers, including 938 duplicates, which we removed. After two rounds of screening for eligibility, we retained a total of 116 papers for data extraction (Figure 1). We grouped these into curricular example papers ($n = 74$), and position papers, reviews, existing guidelines, and policy documents ($n = 42$).

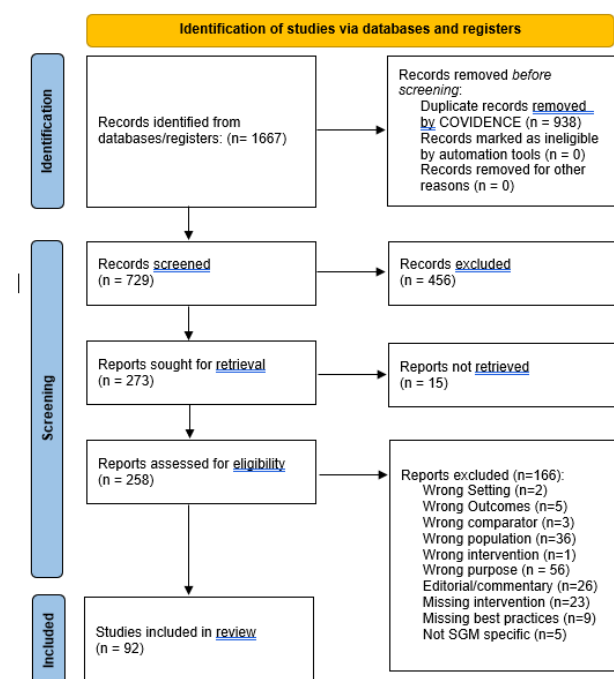


Figure 1. Prisma diagram

We analysed curricular example papers first; we organized the main recommendations, novel contribution to literature, or best practice recommendations from each of these papers into the following themes through iterative discussion: recommendations regarding interwoven learning ($n = 7$), teaching modalities ($n = 70$), faculty training ($n = 8$), student safety ($n = 5$), and SGM involvement in curriculum delivery ($n = 23$). We wrote Proposition 3-8 around these themes. We then examined position statements and existing guidelines to further supplement these findings, and, in doing so, added two new propositions. We wrote Proposition 1 after conversation revealed the need for a set of learning objectives mapped onto CanMEDS roles; these objectives are largely drawn from existing guidelines, while taking Canadian context into account. Finally, we wrote Proposition 2 to reinforce the iterative nature of curricular design, which should constantly evolve as the SGM landscape in Canada changes.

Proposition 1: Standardize learning objectives across the country to empower each medical student to achieve competency in this field.

Through a thorough review of literature, the AAMC guidelines,¹⁵ and our experiences as medical students, physicians, educators, and advocates, we developed a suggested list of competencies and relevant citations (Table 2), guided by existing CanMEDS roles.¹³ It is important to note that, unlike the current curriculum landscape in Canada, these competencies span much more than cultural sensitivity and include elements vital to becoming a medical expert, the CanMEDS Integrating role. These suggested learning objectives are also much more specific and detailed than the current broad MCC objectives (pertaining to provision of gender-affirming care and maintaining a welcoming environment for the SM and GM communities).¹¹ In addition, wherever appropriate, we have included separate and specific learning objectives for the SM and GM communities. The landscape of SGM communities is constantly changing, and competencies should be continuously revised to stay current.

Proposition 2: Use established curricular models to guide the establishment, monitoring and continual improvement of curricula.

We recommend the use of established curricular models for designing and implementing curricular change according to the competencies described in Proposition 1. This facilitates consistent approaches to reform that resist faculty turnover and ensure continued improvement of

new curricula. We include validated models and examples of educators who have used them to develop an SGM curriculum to offer a starting point. Institutions should use the curricular development method they are most comfortable with if it helps ensure consistency and integrates an evaluation and improvement step.

First, the Kern model of curriculum development¹⁶ is a 6-step circular process that has been validated numerous times for developing and monitoring a new curriculum.¹⁷⁻²⁰

The Kern model has been used with success by a group of educators at Rutgers University to develop two curricula, one as an introduction to the SGM community in general¹⁷ and one specific to transgender health.²¹ Both showed an increase in understanding and comfort among first-year students. Their use of the Kern model helped them establish a teaching method (good and bad performance videos) that was novel to their institution.^{17,18}

The Kirkpatrick model to guide curriculum evaluation²² has also been validated for SGM education.^{20,23,24} Roth et al. describe its use in creating a curriculum based on AAMC competencies.²⁵ This model guides the process of evaluation and feedback on a new curriculum, which in turn drives future improvements. Specifically, for the SGM community, Zumwalt et al. have established the SGM-CAT,²⁶ a list of 12 items distilled from AAMC guidelines that serve as curricular teaching goals. This checklist can be used or adapted to individual institutional goals or CanMEDS objectives (see Proposition 1) to help evaluate new Canadian curricula.

Proposition 3: Interweave SGM content into already existing learning events and avoid stand-alone “LGBTQ+ health” lectures. All learning events with SGM health topics should be mandatory where possible.

Interweaving SGM content into pre-existing mandatory learning events normalizes SGM identities and contextualizes health issues from a diverse and more complete perspective.²⁷⁻³⁰ The original, dominant founding narratives of Western medical schools reflect the values and interests of white, wealthy, heterosexual, cisgender men and are inherently oppressive of outside groups such as SGM individuals.¹⁵ As the medical community has begun to challenge these narratives and redefine medical education to include perspectives of outside groups, it is critical to integrate this content within the core curriculum.¹⁵ Separating SGM content into its own section of the curriculum is a form of “structural othering,” implying that LGBTQ+ individuals are a “special

population,” and that their health issues are separate from the general public.¹⁵ Core-curriculum modifications that account for the broad range of SGM identities and their varying needs will equip students with the skills and understanding needed to provide safe, informed care to all patients, regardless of their specialization.²⁹⁻³⁷

The longitudinal integration of SGM concepts in the medical curriculum decreases student bias towards SGM individuals and leads to better knowledge retention.^{27,35,36,38-41} Roth et al. outline a longitudinal SGM curriculum that was successfully implemented in the pediatric post-graduate medical education (PGME) setting over a year, including both faculty and residents.²⁵ Outcomes included improved practitioner comfort in sensitive SGM-related history taking and teaching this material to students. Following curriculum completion, participants also had an increased interest in adapting their practice to be more inclusive of SGM patients and in applying SGM-specific guidelines.²⁵ Another study surveyed students who had received only one or two lectures on treating youth with gender dysphoria and found that general knowledge and precision in use of terminology decreased over time, suggesting that re-teaching material throughout medical school may improve retention.⁴

We have examples of longitudinal curricula from various programs. Pregnall et al. provide a blueprint for interweaving SGM topics into the existing medical curriculum, focusing on PGME.³¹ They outline clinical considerations for SGM individuals in 27 medical specialties (see Pregnall et al., Table 2 for citations and examples relevant for any educator looking to include SGM content in their specific block or area of expertise). An in-depth audit of existing undergraduate medical curricula and subject-specific methods of SGM content integration is beyond the scope of our paper; however, these examples demonstrate the universal relevance of SGM care.

Further, since longitudinal SGM curriculum has been shown to be effective, SGM learning events must be mandatory so that all students benefit from this training. In fact, SGM education literature frequently cites the limitation of optional learning events:^{24,42} often, people with interest in and knowledge of the topic are the ones who come to the sessions, not students with a knowledge gap.⁴²

Proposition 4: Utilize cases, panels, role-playing exercises, guest speakers and other active learning modalities, as they are more effective than lectures.

The selection of appropriate teaching methods is a critical step for integrating teaching on SGM topics into medical education, as the selected method will influence how students engage with and retain material.⁴³ Typically, the preclinical years of medical school are delivered through lectures; however, students learn more effectively with modalities that encourage both interactions between student and teacher and the opportunity to practice or apply knowledge,^{17,35,36,44–50} neither of which a traditional lecture offers.⁵¹ Conversely, case-based learning allows students to apply the knowledge they acquire to real cases, thereby developing their critical thinking skills.^{17,18,29,43,52–58} This allows for a deeper understanding of the issues that SGM populations face regarding gender, equity in healthcare, and the resulting impacts on physical and mental health.²¹

Panel discussions with members of the SGM community are also highly effective.⁴³ The stories shared by panellists allowed students to acquire new knowledge and better understand the value of these perspectives.^{18,39,45,46,59–61} The realism offered by narrative teaching using panels or guest speakers helps students give these topics meaning; they are therefore more likely to apply these concepts to their own conduct beyond the classroom. Furthermore, panels and guest speakers were students' favourite parts of courses and thus promoted more engagement with the material.⁴³ A facilitated question-and-answer period with presenters helped engage learners by providing an immediate response to questions.⁴³

It is important to recognize that not every institution will have the immediate resources to identify and recruit individuals with lived experience as a member of the SGM community; we provide guidance on this topic in Proposition 8. In addition, question-and-answer periods and discussions must be facilitated by someone with experience or training to ensure the safety of both the presenter and any SGM students in attendance and adequately respond to any intentional or unintentional microaggressions from students' questions. The importance of training faculty is further discussed in Proposition 5. Lastly, role-play and practicing interview techniques are integral to the application of knowledge; we discuss the use of OSCEs in Proposition 7.

Proposition 5: Ensure faculty are adequately trained to provide SGM teaching.

Our experience as students, educators, and advocates, as well as our review of literature, have shown us that a significant barrier to establishing adequate SGM education within undergraduate medical education is the scarcity of faculty training to deliver this content.^{21,25,30,43,43,56,62–64} Professional development of all faculty is essential to prevent perpetuation of harmful stereotypes when teaching.^{21,25,43} Examples of faculty training include discussing the differences between sex and gender, pronoun variations, and expressions of gender identity, and teaching on how implicit and explicit anti-SGM bias “adversely impact[s] communication, rapport and decision making in clinical care and education settings.”⁶⁵

Biro et al. conducted qualitative focus groups with medical students who identified that variability in preceptor quality impacted their learning; furthermore, they noted that persistent prejudices held by faculty negatively impacted learning.²¹ There is, however, conclusive evidence showing that faculty respond well to training. Roth et al. piloted a curriculum to address gaps in pediatric PGME regarding SGM topics and noted a significant increase in faculty's comfort in teaching this material afterwards.²⁵ Key skills for faculty to master extend beyond the material itself and include discussion facilitation skills to avoid overwhelming students and help strike a balance between students who may be more well-versed in these topics and those who are seeing it for the first time.^{21,43,56,64} In addition, faculty should be able to sensitively redirect participants who may accidentally perpetuate stereotypes or misgender,⁶⁶ and should engage in continuous and proactive self-reflection to assist in managing implicit bias.⁶⁵

Developing faculty training should follow the same overall approach as the development of student learning materials, including continuous evaluation of the success of this training and ongoing improvements; see Proposition 1.

Table 2. CANMeds roles and suggested competencies

CanMEDS Role	Suggested Competencies - by the end of fourth year medicine, students will...
Medical Expert	<p>Sexual identity:</p> <p>Compare and contrast sex anatomy, sex development, sexual behaviour and sexual orientation.⁴³</p> <p>Recall that sexual identity and sexual behaviour are key components of sexual, physical and mental health and recognize the importance of soliciting this demographic information sensitively for comprehensive medical care⁴³</p> <p>Provide effective primary care, anticipatory guidance and screening tests for patients (ex: intimate partner violence, safe sexual practices, cancer screening)^{31,43}</p> <p>Gender identity:</p> <p>Recognize the difference between sex anatomy, gender identity and gender expression. Define transgender, non-binary, intersex and Two-Spirit⁶⁷</p> <p>Identify atypical sexual development (Congenital Adrenal Hyperplasia, etc), its etiologies and basic management strategies, including counselling parents. Describe the harm done to intersex patients whose anatomy has historically been forcefully corrected by the medical field as infants.^{24,68}</p> <p>Discuss how gender identity impacts both physical and mental health and elicit this demographic information sensitively during patient encounters.⁴³</p> <p>Perform sensitive and trauma-informed physical examinations, and identify when such exams may be inappropriate or unnecessarily traumatizing.²⁴</p> <p>Describe the options available for patients seeking to transition, including medical transitions (i.e. hormone therapy) and surgical options, their indications, benefits, risks and how to prescribe medications.^{12,31}</p> <p>Recognize how patients may choose to affirm their gender identity with non-prescription approaches, including chest binding, tucking, and seeking online hormone therapies, and counsel patients on the risks and safe uses of these options.¹²</p>
Communicator	<p>Sexual identity:</p> <p>Take a comprehensive and sensitive sexual history for patients of any age, race, sexuality and gender identity.²³</p> <p>Gender identity:</p> <p>Discuss the importance of identifying and using the correct pronouns for patients and demonstrate sensitivity when asking for this information.¹²</p> <p>Develop rapport with all individuals involved in the care of a patient regardless of sexual identity or gender expression, including parents, whose concerns and needs may be different than their children.⁴⁹</p> <p>Recognize the sensitivity of some clinical information pertaining to the care of sexual or gender minority patients, including when not to divulge aspects of their identities to family.</p>
Collaborator	<p>Counsel patients and their families about their sexual health and gender identity to empower them toward shared decision-making. Obtain consent from a patient before involving family.¹²</p> <p>Identify the importance of allied health in the care of gender minority patients and involve the entire health team in decision-making for patient care.⁶⁹</p>
Leader	<p>Recognize and develop strategies to mitigate the inherent power imbalance between physician and patient, patient and parent/guardian, and physician and parent/guardian.²³</p> <p>Discuss how implicit and explicit bias about sexuality and gender may adversely affect patient care and engage in constant corrective self-reflective processes to lessen these effects.</p>
Health Advocate	<p>Identify the historical, political, institutional and sociocultural factors implicated in minority stress for both SM and GM groups and how this relates to poor physical and mental health outcomes.⁴³</p> <p>Describe the Canadian legal and cultural context for medical and social transition and how to help transgender patients navigate this process.¹</p> <p>Recall the Canadian legal requirement to refer patients for care related to sexual or gender identity if one is not comfortable providing such care.</p> <p>Engage in continuous self-development throughout one's career surrounding SGM health care topics, as terminology, legal and political landscape, and medical needs are always evolving.²³</p>
Scholar	<p>Provide local, provincial and national resources to both SM and GM patients who seek support beyond the medical office.</p> <p>Identify how SGM topics relate to any subspecialty in medicine.³¹</p>
Professional	<p>Recognize communication patterns in healthcare settings that may prove detrimental for a patient and develop strategies to effectively address these situations to protect patients from the implicit bias of other team members.</p> <p>Recognize that team members may also identify as a sexual or gender minority and provide support when needed to maximize inclusion and minimize the harmful effects of implicit bias on team members.</p>

Proposition 6: Foster a safe space for all students, especially 2SLGBTQ+ students.

A 2019 systematic review of experiences of SGM medical students found that they experience more discrimination than inclusion during training.⁶⁶ All students have the right to a safe and healthy learning environment. Protecting this right includes having a curriculum that adequately covers SGM topics, improving the diversity climate of the institution, and preparing students to care for this population by facilitating positive interactions with SGM individuals.^{5,33} The lack of an adequate curriculum burdens students, particularly SGM students, with organizing extracurricular teaching on fundamental SGM health issues. It not only tells SGM students that their identity and needs are not essential to medical education, but also puts the onus on an already marginalized group to educate their peers and justify the relevance of SGM health.^{70,71} It is the institution's responsibility to foster an inclusive space with faculty who have adequate diversity training.

Providing adequate training can help improve comfort in teaching these topics and in interactions with SGM students, which ultimately creates a safer environment for SGM students. An institution that is welcoming to SGM students and prioritizes faculty awareness and acceptance of the SGM community is more likely to be a positive environment for SGM faculty; this leads to better recruitment and retention of SGM educators.⁷² Representation is important; SGM faculty serve as mentors, role models, and advocates for SGM students and staff. They can positively influence institutional views and policies on the SGM community, promoting a culture of respect and equity.⁷² Institutions with diverse, actively inclusive faculty establish an environment where students can be safely out, which results in improved clinical preparedness for all students.

Increased student contact with SGM peers leads to better preparation in caring for SGM patients. Peer-to-peer teaching by Queer students, who consistently demonstrate greater knowledge in SGM topics than their heterosexual, cisgender counterparts, can help other students better understand SGM communities and cultures.^{42,71} Phelan et al. found that more frequent favourable contact with SGM colleagues and patients, less faculty role modelling of discriminatory behaviour, and less discrimination reported by SGM students were associated with lower bias against SGM individuals and greater perceived skill and preparedness in caring for SGM patients.⁵ Burke et al. found that "more frequent and more positive intergroup

contact predicted more positive attitudes toward gay men and lesbian women."⁶⁷

Proposition 7: Utilize OSCEs as a teaching tool

Simulation and role-playing tools, such as Objective Structured Clinical Exams (OSCEs), have a role in developing cultural competence in a low-stakes environment. This learning environment allows students to make mistakes and ask questions without offending or harming patients.⁷³ Greene et al. propose the Learner Activation Framework to engage students in their own learning about transgender health over four levels that help develop agency and self-direction.⁶⁸ The effective use of OSCEs requires mitigating the sense of judgement that students may feel from their peers. Potter et al. established a set of ground rules for role-playing scenarios and found that faculty enforcement of these rules made students feel safer engaging with the material.⁵⁹

It is important to craft cases that adequately prepare students without contributing to bias. In discussions with students, a prominent critique of current Canadian curricula is that cases reinforce stereotypes by only discussing SGM patients when their sexuality or gender directly contributes to the case, which often carries a negative connotation. A classic example is the patient with HIV who is always a man who has sex with men, or a case in psychiatry where the patient's depression is tied to their gender identity and nothing else. We propose two ways to mitigate this: first, ensuring cases presented in OSCEs are more nuanced and less focused on the gender or sexuality of a patient. Second, and arguably more important, ensure there are cases of SGM patients seeking care for reasons other than their identity, such as a broken arm. This introduces scenarios where a patient's sexual and gender identity is only relevant as demographic information and does not warrant an in-depth discussion about sexual practices.

Furthermore, many students may feel the need for more than one opportunity to acquire skills and confidence for SGM patient encounters.^{55,60,68} See Proposition 3 for more information on the benefit of a longitudinal curriculum. Additionally, OSCEs are a valuable tool for assessment, as demonstrated by DeBrosse et al, who utilized an OSCE to assess whether their novel SGM curriculum had imparted additional knowledge and skills on students.⁷³

Finally, while OSCEs are not always representative of true patient interaction, hiring standardized patients with lived experience of the identity they are portraying can improve

the authenticity of the scenarios.^{46,54,55,74,75} Proposition 8 has information on recruiting members of the SGM community locally to facilitate the delivery of a course, including OSCEs.

Proposition 8: Ensure 2SLGBTQ+ communities are involved in creating new curricula, without over-burdening them or putting the onus entirely on students to be these representatives.

The importance of involving local SGM communities in the planning and execution of a curriculum cannot be understated and is especially important in two different phases of establishing a curriculum. First, a reliable needs assessment requires input from the community the curriculum is designed to assist.^{17,30,46,76,77} Since the political and social landscape varies by region across Canada, consulting with local communities will provide insight and help guide curriculum design. Second, as previously described, most curricula will utilize teaching modalities where an SGM perspective is presented (such as in panel sessions, focus groups, or small group discussions), or where a student can interact with an SGM patient through OSCEs⁷³. Early and transparent communication with local communities will help facilitate the recruitment and retention of SGM individuals who can participate in or help conduct these sessions.^{47,74}

Limitations

The high number of duplicate papers retrieved, and number of papers excluded based on inclusion criteria, points to a robust search strategy with broad catchment. However, our review is limited by the nature of grey literature retrieval, which is not indexed or easily searchable. It is possible that we left out important organizations and thereby missed important position statements or policy documents. Nevertheless, these papers wouldn't likely change our outcomes. Rigorous data collection and repetition of themes has ensured saturation of data. In addition, our iterative, discussion-based process was prone to infusing our work with our own biases; however, as individuals with lived experience in SGM education, we felt these biases are an integral part of ensuring these propositions are practical and rooted in the reality of medical education. Finally, since undertaking this work, Ellaway et al published the results of a robust modified Delphi study resulting in a proposed curriculum that can be implemented in a Canadian context⁷⁸; our core values and specific learning objectives are largely in

alignment with this paper, further supporting our propositions.

Conclusion

This paper describes a broad and thorough review together with an iterative discussion process by which we developed eight propositions we feel, through our experience as educators and students, would benefit any standardized SGM undergraduate medical curriculum in Canada.

Canada must develop a national standard for SGM medical education, as any physician can expect to encounter SGM patients in their practice, no matter the field. SGM medical care is a core component of comprehensive, generalist care; it is therefore critical for curricular development teams to adapt to the needs of students and the changing climate of medicine and evolve to include pertinent training for under-served populations like the SGM community. An adequate SGM medical curriculum that is enforced by national accreditation standards validates Queer and Trans medical students, fosters a more inclusive learning environment, and ensures that all medical students are provided with the tools needed to safely care for a diverse patient population.

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Appendix A. Data extraction form

Field	Definition
Article Characteristics	
Title	Full title of the document
Authors	Complete list of all authors
Country of origin	Country in which the study was conducted
Journal	Full name of the journal in which the article was published. If this is a policy paper, opinion article, etc, please write the full name of the organisation that has released it
Publication date	Year of publication
Study Characteristics	
Paper type	Is this a study with an intervention? If yes, please specify the type of study (RCT, case/control, pilot project, etc). If not, please specify if this is a policy paper or opinion article.
University/medical school	Which school or schools were involved in the study? Please list all
Level of training of participants	What stage of training were participants? Please list all. (For example, first year medical students, all years of medical school, final year medical students and first year residents, etc)
Other involved programs	Were programs other than medicine invited to participate or involved? Please list (For example, nursing students, dentistry students, pharmacy students, etc)
What were the learning objectives of the intervention?	Please list all learning objectives. If this is not an interventional study (opinion article, policy paper), please list all learning objectives the authors are advocating for or discussing
Lead of project	Please specify the level of training of the project leads. Was the intervention led by (or opinion paper/policy document written by) medical students, residents or faculty?
Intervention format	In what format did the teaching intervention take place? (For example, lecture, speaker panel, etc). If this is a policy paper or opinion piece, what teaching modality does the paper discuss?
Total number of participants	How many participants were included in the intervention? If this is a policy paper or opinion piece, write N/A
Comparator characteristics	
Was there a comparison to a previous curriculum?	Indicate whether there was a comparison to a previous curriculum, intervention, or set of learning objectives.
Characteristics of comparator curriculum	What did the previous curriculum look like? What were the learning objectives? Who received this teaching? If no comparator, please indicate N/A.
Conclusions drawn from this comparison	What conclusions do the authors draw from this comparison? Be as descriptive as possible. If no comparator, please indicate N/A.
Post-Session Surveys	
Was a post-session survey done?	Was a survey done after administration of the intervention?
What questions did it include?	What questions were administered in the post-session survey? Please list all if possible; if no list is available, please indicate what information the authors sought. If no post-session survey was done, please indicate N/A.
Main conclusions	What conclusions were drawn from the post-session survey? Please be as descriptive as possible. If there was no post-session survey, please indicate N/A.
Main Outcomes	
Recommendations for future education	What recommendations or best practices do the authors suggest? What do the authors want us to learn from this paper? What should we carry forward into our recommendations?
Follow-up questions	What questions, if any, do the authors indicate need further work, future research, or otherwise more study to answer? What are the next steps?

Appendix B. Summary of included curricular examples and their theme analysis

Title	Author, date	Brief summary of study	Main outcomes and contributions	Themes Present
A Critical Intervention in Lesbian, Gay, Bisexual, and Transgender Health: Knowledge and Attitude Outcomes Among Second-Year Medical Students	Kelley et al, 2008	Students were provided a syllabus, distributed prior to class, which included an introduction emphasizing basic definitions and the health hazards of homophobia; descriptions of specific primary care issues for lesbians and for gay men; and an introduction to transgender terms, health issues, and social context. They then heard stories from patients and physicians surrounding these topics.	Students found that hearing personal stories from patients and physicians was helpful Constructive comments mainly focused on the lack of time for the module and desire for skill exercises such as role-play.	SGM involvement, teaching modalities
Integrating Lesbian, Gay, Bisexual, and Transgender (LGBT) Content into Undergraduate Medical School Curricula: A Qualitative Study	Sequeira et al, 2012	4 educational sessions for preclinical medical students. The first 3 were optional, 1-hour lecture sessions. The last was a standardized patient encounter used by all students that involved taking a sexual history of a lesbian patient.	This content is valuable and meaningful to medical students.	Curricular integration, teaching modalities
Transgender Health Education Impact on Medical Student Knowledge, Skills and Attitudes	Dowshen et al, 2013	A new lecture was given to students, then a knowledge assessment was then given to both the same students and residents who did not receive the lecture. The content of the lecture itself is not described.	The lecture itself did not improve knowledge scores but did improve attitudes and skills for taking a history	Teaching modalities
A simple curriculum content change increased medical student comfort with transgender medicine.	Safer and Pearce, 2013	Curriculum content was added to the endocrinology unit of the second-year pathophysiology course regarding gender identity, hormone replacement therapy agents and monitoring. All medical students received an online, anonymous questionnaire 1 month prior to and 1 month after receiving the transgender teaching, asking about predicted comfort treating transgender individuals with hormone replacement therapy.	Prior to the curriculum, 13 (18%) second-year students reported that they anticipated that they would not be willing to see female-to-male transgender patients and 11 (15%) reported that they would not see male-to-female transgender patients. Following the course, the proportion of students reporting that they would not see patients for both conditions fell to 3%	Teaching modalities
Introductory Learning of Inclusive Sexual History Taking: An E-Lecture, Standardized Patient Case, and Facilitated Debrief.	Bakhai et al, 2016	Online module completed before class asynchronously, then practice interviewing a standardized patient followed by a small group debrief with a facilitator	Students had demonstrated improved perceived comfort and preparedness	Teaching modalities
An Active Learning Module Teaching Advanced Communication Skills to Care for Sexual Minority Youth in Clinical Medical Education.	Bakhai et al, 2016	The session utilized multiple active learning modalities including flipped classroom, small-group learning, and peer-to-peer instruction to teach about adolescents questioning their sexuality and how to provide care for this demographic	Learners demonstrated a significant improvement in self-reported knowledge, comfort, and sense of preparedness on all skill-based objectives and reported growth in their comfort and sense of preparedness for counselling adolescents questioning their sexual orientation after participating in the session	Teaching modalities
Evidence-based Curricular Content Improves Student Knowledge and Changes Attitudes Towards Transgender Medicine	Eriksson and Safer, 2016	One-hour lecture on gender identity and transgender health care, with a pre-and post-survey completed by attendees.	Immediately following completing the content, a significant number of students changed their answer regarding the etiology of gender identity so that the number of correct responses increased from 63% (n = 56) to 93%. For transgender treatment, the number of correct responses increased from 20% (n = 56) before completion to the content to 50% (n = 121) following completion.	Teaching modalities
Complete Androgen Insensitivity Syndrome: A Problem-Based Learning Case.	Neff and Kingery, 2016	Problem based learning where students read a case, formulated their own learning objectives based on their own knowledge	Overall increase in knowledge and comfort in managing CAIS	Teaching modalities

		gaps, and then researched and presented their findings.		
Teaching Medical Students How to Ask Patients Questions About Identity, Intersectionality, and Resilience.	Potter et al, 2016	Pre work handed to students including readings to finish before class. Faculty were specifically trained for delivering this content, although this was voluntary. Students then practiced interviewing each other (students as actors)	Students wanted a prework section defining specific terminology and a patient panel describing diverse identities and experiences to supplement the curriculum described here. Specifically, interviewing each other was seen as less beneficial than potentially interviewing members of the SGM community.	Teaching modalities, SGM involvement, faculty training
Transgender Health: A Standardized Patient Case for Advanced Clerkship Students.	Underman et al, 2017	Trans SP interview practice for 10-minute planned scenario, then feedback from SP and faculty	Students felt it helped them talk to trans patients about pronouns, health, etc. The importance of a trans SP, and a peer they can speak to for safety, was emphasized.	Teaching modalities, student safety, SGM involvement
Introduction to Safe Space Training: Interactive Module for Promoting a Safe Space Learning Environment for LGBT Medical Students.	Gacita et al, 2017	Online, voluntary, 30 minute self-paced module including basic terminology, followed by two online scenarios participants interacted with to create a safe space for patients in a clinic	Increased understanding and ability to create a safe space for queer patients and peers	Student safety
Genetics in LGB Assisted Reproduction: Two Flipped Classroom, Progressive Disclosure Cases.	Jin and Dasgupta, 2017	1.5-hour session with multiple choice questions throughout, taught by third- and fourth-year medical students	Increase in awareness of how genetics can be applied to selecting reproductive choices for both homosexual and heterosexual (not trans) couples	Teaching modalities, curricular inclusion
Interprofessional LGBT Health Equity Education for Early Learners.	Leslie et al, 2017	75-minute session where a group of 20 students from multiple different allied health schools worked together on a case about an SGM person seeking care	Better knowledge of LGBT health issues, but disconnect between knowledge and application of solutions for health issues (participants often elected to refer to someone who specializes in LGBT care)	Teaching modalities
Transgender Medicine Curriculum: Integration Into an Organ System-Based Preclinical Program.	Marshall et al, 2017	Lecture followed by a mock interview done between a trans patient and a faculty member, observed by students who attended the lecture	Preparedness increased except for people who stated they already were knowledgeable at baseline	Teaching modalities
Beyond Men, Women, or Both: A Comprehensive, LGBTQ-Inclusive, Implicit-Bias-Aware, Standardized-Patient-Based Sexual History Taking Curriculum.	Mayfield et al, 2017	Pre-readings followed by a 30-minute lecture on LGBTQ terminology and pronouns, and finally 3 SP cases. One case is presented first as a heterosexual couple then as a homosexual couple immediately after so students can reflect on biases. Students interviewed in pairs both for time and for overall safety of all participants	Significant increase in comfort taking a sexual history overall, and with LGBTQ patients specifically.	SGM involvement, , teaching modalities, student safety
A first step in addressing medical education Curriculum gaps in lesbian-, gay-, bisexual-, and transgender-related content: The University of Louisville Lesbian, Gay, Bisexual, and Transgender Health Certificate Program.	Sawning et al, 2017	Optional certificate program: 11 sessions offered; students had to attend 4 to qualify for a certificate. No faculty involved, hinged entirely on community members for delivery given barriers in faculty training. Program was open to more than just medical students, facilitating interdisciplinary training.	Wanted more opportunities for interprofessional interaction. Students stated this was very useful and should be integrated into medical curriculum officially. Students felt it would be beneficial to practice skills with an SP.	SGM involvement, teaching modalities, faculty training
Enhancing Pediatric Trainees' and Students' Knowledge in Providing Care to Transgender Youth.	Vance et al, 2017	Six online modules completed over 2 hours, then a half day of observation in a trans health care clinic	Increase in perceived knowledge and awareness of issues facing transgender youth, knowledge not objectively assessed.	Teaching modalities
Transgender Health Medical Education Intervention and its Effects on Beliefs, Attitudes, Comfort, and Knowledge.	Cherabie et al, 2018	A lecture on trans health (content is poorly described)	A lecture on transgender health issues can positively change attitudes, comfort levels, and knowledge on transgender health issues significantly with the changes sustaining after 90 days. Beliefs tend to be much harder to change, which may be because beliefs were already favorable.	Teaching modalities
Incorporating LGBT Health in an Undergraduate Medical Education Curriculum Through	Cooper et al, 2018	1-hour lecture on social determinants of health impacting MSM and trans individuals.	Increased knowledge and comfort in students polled (perception only, knowledge not formally tested)	

the Construct of Social Determinants of Health.				
Clinical Exposure to Transgender Medicine Improves Students' Preparedness Above Levels Seen with Didactic Teaching Alone: A Key Addition to the Boston University Model for Teaching Transgender Healthcare.	Park and Safer, 2018	Clinical elective in trans care made available on a voluntary basis for students, pre and post survey administered to those who participated	Encounters with trans people in a clinical setting improved knowledge and comfort but not attitudes because people who picked the elective already had good attitudes about it	SGM involvement, teaching modalities
Let's Talk About Sex: The Social Determinants of Sexual and Reproductive Health for Second-Year Medical Students.	Stumbar et al, 2018	One hour lecture and then one hour patient panel (HIV positive patient, middle aged gay man and young trans woman). Students could ask questions.	Overall outcomes are mixed and difficult to interpret given the lack of standardization across questions asked of students after the session. Anecdotally students felt this was valuable for their learning.	Teaching modalities, SGM involvement
Implementation of teaching on LGBT health care.	Taylor et al, 2018	1-hour lecture on legislation for trans individuals, the importance of chosen pronouns, health care disparities etc, followed by a workshop focusing on consultation skills, considerations of what constitutes homophobic or heterosexist language and awareness of stigma. Students in upper years delivered the workshop for students in lower years.	Comfort increased; students have provided examples of ways they will change their practice to be more inclusive.	Teaching modalities
Teaching paediatric transgender care.	Vance et al, 2018	Administered assessments before and after the completion of six online modules focused on medical and psychosocial considerations for transgender youth	This study suggests that e-learning was an effective stand-alone intervention to enhance transgender-related knowledge and self-efficacy in interdisciplinary learners.	Teaching modalities
Education of the medical profession to facilitate delivery of transgender health care in an Australian health district.	Arora et al, 2019	First surveyed trans people in the area about their thoughts or needs regarding their family doctor and whether their health needs were being met, where gaps were. This was used to develop a course. Pre and post survey for doctors and medical students that participated in the course.	Improved understanding of numerous concepts and comfort in providing medical treatment. Consistent with international literature findings.	SGM involvement, teaching modalities
The Case of Ty Jackson: An Interactive Module on LGBT Health Employing Introspective Techniques and Video-Based Case Discussion.	Gavzy et al, 2019	The course was comprised of teaching about the various dimensions and aspects of human sexuality using the Genderbread Person, administration of a sexuality survey to assist learners in self-reflection and their comfort in discussing sexual health and experience with homophobia and transphobia with peers, a presentation to review unique health issues and disparities for SGM individuals and how to provide affirming care, and finally small group sessions to watch a pair of videos showcasing competent and poor communication between a provider and patient.	Very good outcomes - students especially responded well to the videos that sparked discussion. Paper includes great tips for things that can be improved. However, did not test content on exams, so no objective measure of how students integrate the material.	SGM involvement, teaching modalities, student safety
Promoting Affirmative Transgender Health Care Practice Within Hospitals: An IPE Standardized Patient Simulation for Graduate Health Care Learners.	McCave et al, 2019	First attended a 40-minute panel with trans people sharing their experience in healthcare. Then watched a 10-minute video depicting a patient interaction in the ED, talked about it in small groups, and did a discharge planning exercise. Then met again as a large group to further debrief.	Activities where the transgender voice (panel or SP) was centred were rated higher by students	SGM involvement, teaching modalities
LGBT+ Health Teaching within the Undergraduate Medical Curriculum.	Salkind et al, 2019	A 45-minute lecture to teach background knowledge, terminology, LGBT+ inequality, legal protection for SGM people and professional guidance, followed by a 45-minute session with a patient visitor who identifies as transgender, where students were invited to ask questions about their	There was a significant improvement in confidence in using appropriate terminology to describe people who are LGBT+. Students felt the opportunity to ask questions of a trans patient was the most vital part.	SGM involvement, teaching modalities

		experiences accessing healthcare, and finally a 1.5 hour seminar to work through four clinical scenarios with the objective of making services inclusive.		
Assessment of Internal Medicine Resident Preparedness to Care for Lesbian, Gay, Bisexual, Transgender, and Queer/Questioning Patients.	Streed et al, 2019	1hr online module for residents in PGY 1-3	Demonstrated residents are not prepared to care for queer people prior to receiving this training, and test scores significantly increased post training.	Teaching modalities
The Case of Sean Smith: A Three-Part Interactive Module on Transgender Health for Second-Year Medical Students.	Berenson et al, 2020	Presentation about the unique health issues and disparities faced by transgender patients, followed by a small group session viewing and analysis of a pair of videos showcasing competent and poor communication between a provider and a transgender patient, and finally a large-group patient panel featuring members of the transgender community where students could ask questions about lived experience.	Students responded well to both the content and teaching modalities, and overall seemed to increase in knowledge	Teaching modalities
Education First: Promoting LGBT+ Friendly Healthcare with a Competency-Based Course and Game-Based Teaching.	Yang, 2019	2-hour "gamified" lecture - a "warm up" exercise that was a 3x3 grid of questions students could pick from to answer for their team, and the first team to get a row of 3 correct wins (tic tac toe). Then, a 1hr lecture explaining the answers to these questions, and featuring some SGM patients sharing their lived experience	The game at the beginning helped students be engaged and focus on the lecture throughout the rest of the time, and assessment as learning was favoured by students as it was less pressure than an exam and helped retain information better, but was more taxing on the teachers who felt frustrated when a student said something incorrect that they didn't know how to respond to	Teaching modalities, faculty training
Teaching Intersectionality of Sexual Orientation, Gender Identity, and Race/Ethnicity in a Health Disparities Course.	Bi et al, 2020	First, a lecture reviewed sexual and gender minority (SGM) health disparities, intersectionality, minority stress, and shared decision making (SDM) to establish shared language among 83 first-year medical students. Students then viewed four videos of SGM patients of colour (POC) describing their health care experiences, each followed by moderated discussion about how compounded minority stress affects lived experiences and health and how to improve SDM for SGM POC.	The session was well received, improved student knowledge of intersectionality, and improved confidence in communicating with and caring for SGM patients.	Teaching modalities
Improving Communication with LGBTQ Patients: A Pilot Curriculum During the Psychiatry Clerkship.	Fadus et al, 2020	Students were given two pre-readings then participated in a 90-minute discussion-based seminar consisting of information-giving teaching, multiple choice questions, clinical vignettes from the AAMC and role playing and problem-solving LGBTQ clinical scenarios.	statistical improvement across knowledge and comfort items in pre and post surveys	Curricular integration, teaching modalities
A Novel Curriculum for Medical Student Training in LGBTQ Healthcare: A Regional Pathway Experience.	Gibson et al 2020	Includes some online modules and readings, a course with an evaluation of knowledge, service learning with an LGBTQ organization, 4-week LGBTQ clerkship, and research/QI obligations. Enrolment by application only and only 15 students accepted a year.	Outcomes unclear as only 6 students have completed the entire 4-year program at the time of publication. Overall promising results.	Curricular integration, teaching modalities
Transgender Health Care Curriculum Development: A Dual-Site Medical School Campus Pilot.	Najor et al, 2020	1hr lecture given to first year students with pre and post surveys, and an additional survey 1 year later to assess retention.	Showed a statistical significance in baseline knowledge: students who believe being trans is a choice are less comfortable treating trans patients. Large retention in knowledge at the 1-year mark	Teaching modalities
Rainbows and "Ready for Residency": Integrating LGBTQ Health Into Medical Education.	Roth et al, 2020	Assigned small groups a case to research and questions to answer, and groups then presented findings to the larger group, assisted by a resident facilitator.	Outcomes mainly focused on student enjoyment/perceived value in the session as opposed to knowledge or comfort increase.	Teaching modalities

Student Journal Club to Improve Cultural Humility with LGBTQ Patients.	Thomas et al, 2020	Students were given an article to read and think up questions 2 weeks before the session, then met with a facilitator to discuss the article. One person from the group was assigned to write a reflection.	Helped students learn, but no assessment of knowledge retention or comfort.	Teaching modalities
Evaluation of a gender-affirming healthcare curriculum for second-year medical students.	Thompson et al, 2020	The curriculum included five online modules, a quiz, a 3-hour case-based workshop and a 2-hour interactive patient-provider panel. Included the opportunity to role play the use of pronouns and the case of a non-binary patient.	Skills and knowledge improved, but no significant change in attitudes, likely given favourable attitudes at baseline	Teaching modalities
Comprehensive Curriculum for Internal Medicine Residents on Primary Care of Patients Identifying as Lesbian, Gay, Bisexual, or Transgender.	Ufomata, 2020	The modules contained facilitator and learner guides and addressed four main content areas: understanding gender and sexuality; performing a sensitive history and physical examination; health promotion and disease prevention; and mental health, violence, and reproductive health. Faculty were trained before delivering content to students.	Confidence significantly increased in many areas, including being able to provide resources to patients and to institute gender-affirming practices. Knowledge improved significantly on almost all topics.	Teaching modalities, faculty training
A Pediatric Transgender Medicine Curriculum for Multidisciplinary Trainees.	Vance et al, 2020	6 online modules followed by observation/shadowing in a gender clinic.	Overall improvement in both comfort and knowledge, for both people who went to clinic and people who only did online modules. Observation in clinic did not significantly impact scores but students found it valuable.	Teaching modalities, SGM involvement
Medical students' knowledge of and attitudes towards LGBT people and their health care needs: Impact of a lecture on LGBT health.	Wahlen, 2020	Compulsory 1 hour lecture with pre and post quiz. Content of lecture is not well defined	Baseline favourable attitude and some knowledge, and knowledge increased after the lecture.	Teaching modalities
Interactive Session for Residents and Medical Students on Dermatologic Care for Lesbian, Gay, Bisexual, Transgender, and Queer Patients.	Barrett, 2021	90-minute lecture on LGBTQ health care disparities and dermatologists' roles, how to provide inclusive care, derm-specific health concerns and screening for the LGBTQ population. This was followed by a 30-minute interactive role-playing session where participants acted as either an observer, patient or provider in 3 clinical scenarios.	Participants highlighted five main themes as useful aspects of the session: (1) the overview of how to conduct a comprehensive sexual history, (2) sample questions to use in a sexual history, (3) practicing a sexual history, (4) algorithms for laboratory tests and screenings for patients depending on past medical and sexual history, and (5) information on health disparities in the LGBTQ population	Teaching modalities, curricular integration
HIV Pre-exposure Prophylaxis Education for Clinicians Caring for Spanish-Speaking Men Who Have Sex With Men (MSM)	Alzate-Duque, 2021	Spanish-language PowerPoint slide deck with information about PrEP as well as a Spanish-language videotaped scripted clinical encounter.	Reported increased comfort in discussing and confidence in prescribing PrEP	Teaching modalities
PrEP University: A Multi-Disciplinary University-Based HIV Prevention Education Program	Cannon et al, 2021	This education series was divided into two 60-minute lectures given one week apart by two infectious disease specialists with expertise in LGBTQ health. Topics addressed included HIV epidemiology and testing, sexual history taking, HIV prevention strategies and PrEP education	Increased knowledge after course, students reported being able to prescribe PrEP more comfortably.	Teaching modalities, faculty training, curricular integration
First year medical student experiences with a clinical skills seminar emphasizing sexual and gender minority population complexity.	Biro et al, 2021	4-hour session, which included a lecture and opportunities to practice taking a sexual history from a standardized patient, which the students did in pairs	Post session surveys highlighted SGM bias from multiple sources (faculty, SPs, students, curriculum), and the importance of clinical skills training. Students stated they benefited most from faculty who were themselves SGM-identifying or had been previously trained with this material.	Faculty training, SGM involvement
An LGBTQIA+ Symposium to Improve Care for Sexual and Gender Minority Youth.	Elkin et al, 2021	The symposium included a resource fair, keynote speaker, patient and provider panel, and breakout sessions. The lecture components of the symposium were followed by small-group discussion	Initial improvement in knowledge scores immediately post symposium, but reported decrease in knowledge scores 10 months later when re-tested	Teaching modalities

		breakout sessions that centred around a 3-part interactive case that followed a hypothetical SGM adolescent through several primary care appointments from initial presentation to management options, providing learning around the considerations and challenges involved in providing gender affirming care to SGM youth. A semi-structured discussion guide was provided for facilitators.		
Allyship in Surgical Residents: Evidence for LGBTQ Competency Training in Surgical Education.	Grova et al, 2021	2-h educational training included 5 sections of lecture and then case scenarios.	The provided training significantly improved knowledge and comfort, and participants state it's relevant to their care.	Teaching modalities
Attitudes Toward Transgender People Among Medical Students in South Korea	Lee et al, 2021	The lecture included discussions on the definition and core concepts of gender, gender dysphoria, transgenderism and related epidemiology and biology, psychiatric and social issues, health disparities, general primary care, hormone replacement therapy, and surgical options	The mean score on a validated knowledge assessment tool between the preintervention and postintervention surveys did not represent a significant difference.	Teaching modalities
Early Intervention for LGBTQ Health: A 10-Hour Curriculum for Preclinical Health Professions Students.	Minturn et al, 2021	Developed a 10-hour LGBTQ health curriculum, including lectures and case-based small-group discussions covering LGBTQ terminology, inclusive sexual history taking, primary care and health maintenance, and transition-related care. It also included a panel discussion with LGBTQ community members and a small-group practice session with standardized patients.	During the pre-course survey, students almost exclusively disagreed (a rating of 1 or 2) that they felt capable of meeting any of the seven learning objectives, pertaining to including sexual history taking, LGBTQ terminology, primary care, health maintenance and transition-related care. Following the course, students nearly exclusively agreed (a rating of 3 or 4) that they felt capable of meeting all objectives. The increase in self-reported confidence was statistically significant for all seven objectives	Teaching modalities, SGM involvement
Effectiveness of an Educational Intervention to Improve Medical Student Comfort and Familiarity with Providing Gender-Affirming Hormone Therapy.	Pathoulas et al, 2021	1-hour interactive lecture on gender-affirming hormone therapy	Mean response score about subjective degree of confidence changes increased significantly after the intervention around the use of chosen names, the use of informed consent to initiate GAHT, initiating and managing GAHT in the primary care setting, medications used in GAHT, and dosing.	Teaching modalities, curricular integration
Teaching Sexual Orientation and Gender Identity in Pediatric Clinical Settings: A Training Workshop for Faculty and Residents.	Paul et al, 2021	The workshop started with an introduction of the facilitators, who were then deliberately assigned to tables for facilitated work with the participants. A learner activation component including showing a 7-part patient vignette video was done to engage learners, then a lecture presentation and subsequent small group case-based discussion and role play were done. Finally ended with a debriefing session. The entire workshop took two hours.	Increased knowledge and comfort on post-workshop assessments, but authors did not deliberately assess whether students were more equipped to teach.	Teaching modalities
Bridging the Gap in Graduate Medical Education: A Longitudinal Pediatric LGBTQ Health Curriculum.	Roth et al, 2021	Monthly sessions over a year, with a mix of faculty led and student led talks, as well as small group activities and workshops. Each session had a separate theme and learning objectives.	Mean scores regarding comfort, perceived knowledge was all higher, but actual knowledge testing increased only from 2/8 correct to 3/8 correct on average	Teaching modalities, faculty training
Classroom Instruction: Medical Students' Attitudes Toward LGBTQ+ Patients.	Sanchez et al 2021	Prior to class instruction, class lecturers shared their personal stories and their advocacy work with LGBTQ+ communities (10 min). The presentation was delivered in two parts: a 90-min lecture and a 20-min clinical case study with question prompts designed to promote classroom discussion	Post-instruction, students reported a significant increase in understanding of bisexuality, being transgender, and LGBTQ+ couples' adoption rights.	Teaching modalities

Using Standardized Patients to Augment Communication Skills and Self-Efficacy in Caring for Transgender Youth.	Vance et al, 2021	The curriculum was comprised of 2 components: an independent e-learning activity consisting of 6 online modules and a half-day observership in a multidisciplinary pediatric gender clinic. Students were then observed interacting with standardized patients and scored.	Learners increased median total checklist scores between cases from 22 to 28 of 34. Learners' overall self-efficacy scores improved by 3.4 between Assessments 1 and 2 and by 1.5 from Assessment 2 to 3.	Teaching modalities, SGM involvement
Increasing medical student confidence in gender and sexual health through a student-initiated lecture series	Mahabamunuge et al, 2021	Student-initiated lecture series, voluntary attendance of various lectures over a year. Participants were awarded a certificate of completion if they completed 5 sessions	Student feedback was overall positive, no pre or post studies to confirm any changes.	Teaching modalities
Teaching LGBT+ Health and Gender Education to Future Doctors: Implementation of Case-Based Teaching	Yang, 2021	Two new courses on gender were added to the students' intern training in clinical psychiatric education, called "LGBT+ Health and Medical Care" (LGBT+ HMC) and "Gender Violence and Gender Dysphoria."	Students indicated benefit from: cases that link theory to clinical practice, experience sharing from LBGT+ patients, discussions of cases increase their effectiveness. It was also found that case-based teaching is challenging due to time limitations, multiplexity of cases, and difficulty of multilevel learning (various stages of clinical training in the room)	Teaching modalities, teacher training
Health History Skills for Interprofessional Learners in Transgender and Nonbinary Populations	Nuud, 2021	University faculty and simulation leads, a community clinic providing gender-affirming care and members of the trans community formed a partnership to develop two cases frequently encountered in clinics for simulation. Learners were divided into interprofessional groups of 3 and completed one of the two scenarios, and then debriefed with patient-teachers after the simulation to encourage self-reflection.	Significant differences showing increased comfort and skill post simulation, but no significant difference in attitude (likely because of high initial attitude scores).	Teaching modalities, SGM involvement
Educating for Quality Transgender Health Care: A Survey Study of Medical Students	Dale et al, 2022	Attendance was optional and the medical students ranged from their first to final year. Three 20-min lectures were given, with time for questions.	There was a significant increase in understanding of what transgender means and about the issues faced by transgender people	Teaching modalities
Implementing Medical Student Teaching on Gynaecological Healthcare of Transgender Patients	Lee et al, 2022	A one-hour teaching session on trans health in gynaecology was developed and delivered to final year medical students	Better understanding of health issues faced by trans people in general, and specifically gynaecological issues.	Teaching modalities
Learning with experts: Incorporating community into gender-diverse healthcare education	Norwood et al, 2022	6 trans and gender diverse participants helped to develop clinical cases that align with the AAMC objectives and deliver them to medical students.	There was a statistically significant increase in each AAMC TGD healthcare competency post-intervention, except for discussing sexual health practices. No changes in perceived value or knowledge were noted. Students reported that authentic engagement with TGD patient collaborators during this session was important for their learning.	Teaching modalities, SGM involvement
Integrating LGBTQ+ Health into medical education	Raygani et al, 2022	A Topic Steward was appointed to expand the curriculum to an integrated curriculum that included lectures, small group discussions, and LGBTQ+ clerkship opportunities.	Outcome specifically mentioned is an increase in the number of hours of LGBT teaching	Teaching modalities
Gender-Affirming Care With Transgender and Genderqueer Patients: A Standardized Patient Case	Weingartner et al, 2022	A standardized patient case describing a patient establishing primary care was developed for rising third-year medical students. The case featured multiple patient iterations to portray individuals with the same health history, but a different gender identity and/or sex assigned at birth. Each student was randomly assigned to one patient encounter. Gender-affirming care skills were assessed through standardized patient checklists, post encounter notes, and preventive care recommendations.	Ninety-eight percent of students agreed that the encounter helped them practice important skills for assessing a patient.	Teaching modalities

Teaching Trans-Centric Curricular Content Using Modified Jigsaw	Zheng, 2022	A modified jigsaw exercise was implemented over 2 hours both in person and virtually several times over two years, with medical students in their endocrine/reproduction course. The session featured a knowledge test, then answers and discussion, and finally a clinical correlation, either a case discussion or video.	Participants showed increased knowledge and self-confidence discussing gender identity and providing clinical care. All students expressed interest in further training and felt this session enhanced their knowledge. At one year, scores were lower than immediately post-session, but still higher than pre-session.	Teaching modalities
Care across the gender spectrum: A transgender health curriculum in the Obstetrics and Gynecology clerkship	Schmidt et al, 2022	This took the form of a two-part curriculum on TGD healthcare topics – an online module followed by interactive cases	students reported increased comfort in caring for transgender patients and endorsed improved knowledge in healthcare maintenance and gender affirming medical therapies for trans patients. A statistically significant increase in knowledge scores is also reported.	Teaching modalities
LGBTQ+ curriculum in medical school: Vital first steps	Singh et al, 2022	During orientation week new medical students were given a 1-hour lecture - the delivery of content alternated with actor scenarios specifically scripted to demonstrate inappropriate or insensitive verbal and non-verbal communication by a physician with LGBTQ patients, paired with a follow-up demonstration that showcased a better approach.	Comparison of all five paired question sets showed a statistically significant increase in: self-reflection on ability to identify implicit bias; knowledge of how gender, biologic sex, and sexual orientation are defined; comfort level in asking about gender identification, and sexual orientation; knowledge of pronoun options; and comfort level in asking about preferred pronouns.	Teaching modalities
CME Article: Integration of Sex and Gender Minority Standardized Patients into a Workshop on Gender-Inclusive Patient Care: Exploring Medical Student Perspectives	Stumbar et al, 2022	The workshop starts with 1-hour lecture on sexual history taking and is then followed by a faculty-facilitated small group session during which students interview an SGM patient and debrief about this experience.	Students believe the integration of SGM standardized patients helped improve knowledge, attitudes and skills relating to providing care for this population and noted that their inclusion was the most beneficial part of the session.	Teaching modalities, SGM involvement
A human face and voice': transgender patient-educator and medical student perspectives on gender-diversity teaching	Ruprecht et al, 2023	Started first with an education session, then preceptor-facilitated small group tutorials led by TGD patient educators. These educators used lived experience to explore medical history taking and broader issues related to TGD healthcare. This was a mandatory session.	Students appreciated the session, increased perception of knowledge. Some concern regarding TGD patients reliving their traumatic experiences, highlighting the need for a safe space for SPs.	SGM involvement, teaching modalities, student safety
Integrating LGBTQIA + Community Member Perspectives into Medical Education	Katz-Wise, 2023	LGBTQ+ community member perspectives and lived experience were incorporated into medical education using community advisory groups, community panel events, standardized patient sessions and community member interviews.	Overall students felt this was beneficial. Challenges noted: representation of diverse identities and experiences, meeting and scheduling logistics, structural barriers in institutional processes, and implementation of community member recommendations.	Teaching modalities, SGM involvement
Assessing Patient Goals for Gender-Affirming Hormone Therapy: A Standardized Patient Case for Medical Students	Spigner et al, 2023	An interdisciplinary team, including individuals with lived TGD experience, developed the SP case that was completed by second-year medical students.	Students reported being significantly more prepared to care for TGD patients and to obtain a gender history post session. Both faculty and students believe this content should be kept in the curriculum as it is important for their practice.	teaching modalities, SGM involvement
A Novel Medical Student Elective Course in Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, and Sexually and Gender Diverse Health: Training Tomorrow's Physician-Leaders	Srinivasan et al, 2023	This 4-week elective course included multidisciplinary clinical placements, self-directed learning, and mentored scholarly projects, all specifically relevant to LGBTQIA+ health.	30 students completed the course, and 12 scholarly projects resulted in 1 published peer-reviewed article. Students who completed evaluations rated the course as excellent and reported increased interest and knowledge in the topic.	Teaching Modalities
Early Exposure to Lesbian, Gay, Bisexual, Transgender, Queer (LGBTQ+) Medicine: Assessing Confidence and Comfort in Preclinical Medical Students	Zajac et al, 2023	Hour 1 was a lecture overviewing SGM clinical medicine from a physician specializing in LGBTQ+ care, then a second hour made up of four 15-minute stations. Students rotated through four stations consisting of a one-on-one SP simulation,	After completion of the workshop students demonstrated increased comfort and confidence in their post-session surveys.	Teaching modalities, SGM involvement

		discussion-based case scenarios, an interactive seminar on trans health and a debriefing station. All facilitators and SPs were members of the LGBTQ community.		
Knowledge, Attitudes, and Beliefs of Medical Students Toward Transgender Healthcare: A Community-Driven Initiative	Sengupta et al, 2023	first-year medical students attended a Trans Health Conference, the goal of which was to provide an educational opportunity where trans people could voice their own stories	Most first-year medical students displayed positive attitudes toward trans people pre-intervention, the students also demonstrated increased knowledge, empathy, and understanding of the transgender healthcare narrative post-intervention.	Teaching modalities, SGM involvement
Evaluating Effectiveness of an Online LGBTQIA+ Health Course for Medical Students	Forer et al, 2024	Developed and implemented a novel, self-directed, 2-week online elective for undergraduate medical students	We found statistically significant increases in clinical preparedness, basic knowledge, overall competency, and self-perceived confidence in caring for SGM patients.	Teaching modalities
Evaluating the Impact of an Adolescent Sexuality Education Workshop on Medical Student Communication in an Objective Structured Clinical Examination	DeBrosse et al, 2024	This was a two-hour adolescent sexuality workshop during the Core Clerkship in Pediatrics. Efficacy was evaluated in an objective structured clinical examination (OSCE), where the standardized patient case focused on an adolescent cisgender male with dysuria and in a new, same-sex relationship. All students did the OSCE, and the research team compared scores of people who took the course to those who did not.	Student's t-test comparison of the scores found significantly higher scores for the psychosocial history domain, particularly concerning disclosure of a new boyfriend and recent sexual activity, for students who had the workshop before the OSCE.	Teaching modalities