ATHABASCA UNIVERSITY

TRANSGENDER AND GENDER DIVERSE CURRICULUM IN MEDICAL IMAGING PROGRAMS: A CASE STUDY

BY

SIDSEL PEDERSEN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF HEALTH STUDIES

FACULTY OF HEALTH DISCIPLINES

ATHABASCA, ALBERTA

JANUARY, 2023

Approval of Thesis

The undersigned certify that they have read the thesis entitled

TRANSGENDER AND GENDER DIVERSE CURRICULUM IN MEDICAL IMAGING PROGRAMS: A CASE STUDY

Submitted by

Sidsel Pedersen

In partial fulfillment of the requirements for the degree of

Master of Health Studies

The thesis examination committee certifies that the thesis
and the oral examination is approved

Supervisor:
Dr. Lynn Corcoran
Athabasca University

Committee Member:
Dr. Paul Jerry
Athabasca University

External Examiner:
Dr. Melissa Jay
Athabasca University

January 24, 2023

Dedication

Completion of this thesis is the culmination of many years of professional and personal growth. It would not have been possible without the support and encouragement of my family. Thank you to Saul, Simone, Louise, and Oscar – you have all played a crucial role in shaping my perspectives and you allowed me the space and time I needed during the journey.

Acknowledgements

Thank you to my supervisor, Dr. Lynn Corcoran, for countless conversations that have led to the completion of this work. Your guidance, encouragement, and knowledge has been a pillar throughout my graduate studies. Your enthusiasm for my topic was evident from our first meeting and I am grateful to have had this opportunity to learn from you. I would also like to thank my committee member, Dr. Paul Jerry, and external examiner, Dr. Melissa Jay.

To the members of the SAIT community, thank you for always being a sounding board for my ideas and thoughts. Thank you to the faculty members who participated in this research. Your willingness to explore this topic with me is appreciated.

I would also like to acknowledge Virginia Sanders - I could never have imagined what would come from our early conversations and work, and I am grateful that our paths crossed at the exact right time.

Finally, I consider it an honor to have been selected as a recipient of the Athabasca University's Excellence in Research Scholarship award.

Abstract

Transgender and gender diverse (TGD) patients face a multitude of barriers when accessing healthcare. There is limited time spent on TGD specific topics in medical imaging programs, which leads to graduates having limited awareness and knowledge of this marginalized community. There is a need for educational programs and institutions to prioritize inclusive teaching practices as faculty members face the demands of updating course curriculum to meet current profession specific competency profiles. The purpose of this thesis is to gain an understanding of how various influences impact faculty members in creating and delivering TGD content in their courses. While focusing on the impacts on the educator's abilities to create inclusive teaching practices, this thesis explores both the role of the institution and the role of individual faculty members.

Keywords: medical imaging, transgender, gender diverse, curriculum, faculty

Preface

I am able to clearly identify the specific moment that started my journey as a researcher. I don't think everyone has that type of experience, and I feel fortunate that this is the case for me. The clarity of the beginning allows me to continually look back at where things started and ground myself in the reasons why I started on this path, as well, I am able to see the development and growth in my role.

When this all started I was working in an x-ray department, my primary role was as an imaging technologist. I also had a role as an instructor at a polytechnic institute. The two roles suited me well, and allowed me to work in the field I was teaching in. It was during a shift at a clinic that I was involved in a case that changed my path, or pushed me on to a slightly clearer path. A relatively simple patient interaction started a chain reaction in my work and I am grateful for having been able to grow and learn.

The topic of providing healthcare for marginalized communities is complex. Transgender and gender diverse (TGD) individuals deserve access to knowledgeable and competent healthcare workers as well as safer and more inclusive spaces. As a researcher there are many considerations before starting. For me, the most important decision was to understand my position, lens, and status within the study. It was important for me to understand why I felt that I was well-suited to begin speaking about TGD curriculum development. I am a cisgender, heterosexual female. I am a medical imaging technologist, educator, and graduate student. Were those credentials sufficient to take on this project? It became evident that it would be imperative that I understand and clarify the purpose and essence of this study.

As an x-ray technologist, I had firsthand experiences that demonstrated that I was unaware of the challenges and dangers that TGD patients face in medical settings. As an educator, I felt that I lacked the knowledge and expertise to teach and create content that

specifically related to TGD communities. I learned that many words and ideas with good intentions were not always suitable or appropriate. I spent time learning about these challenges. I was privileged to listen to those from the community and humbled by the stories they shared. I also read research from other healthcare disciplines to broaden my viewpoint and knowledge base. I have gained a better understanding of my biases, and continually strive to implement reflective practices during my journey. I am gaining an understanding of the importance of both learning and unlearning as it relates to serving the needs and supporting the TGD community.

The reason I chose to complete a case study was to ensure I was learning more about the specific needs of the educators. I wanted to find out how educational institutions can better support their faculty in ensuring that TGD curriculum and content are created in the programs. As an educator I felt this was the best place to focus my attention, with a goal of ensuring medical imaging programs would be able to have their graduates contribute to the creation of safer and more inclusive spaces in a positive and meaningful way. While I do not identify as part of the TGD community, and this study is not primarily focused on the TGD community as participants, the goal is to lay ground work for future projects that may benefit the TGD community.

Table of Contents

Approval Page ii
Dedication iii
Acknowledgements iv
Abstract v
Preface vi
Table of Contents viii
List of Tables xi
Inclusive Terminology xii
Chapter 1: Integrating Chapter 1
Manuscript Overview 4
Manuscript 1: Implementation of Transgender and Gender Diverse Curriculum in Medical Imaging Programs - A Review of the Literature. 4
Manuscript 2: MakeSpaceForEveryone - A Case Study on the Inclusion of Transgender and Gender Diverse Content and Curriculum in Medical Imaging Programs. 5
Significance of Findings 6
Study Limitations 6
Conclusion 7
Future Research 7
Chapter 2: Manuscript #1: 9
Abstract 9
Introduction 10
Terms and Terminology 12
Methods: Search Terms and Search Strategy 13
Results 13
Discussion 14
Theme 1: Importance and Value of SGM Curriculum in Healthcare Programs 14
Theme 2: Preparedness, Experience, and Knowledge to Teach SGM Content 16
Theme 3: Lack of Institutional Support 18
Strategies to Better Include SGM Content in Healthcare Curriculum 19
Stand-Alone SGM Workshops 19
Integration of SGM Curriculum Across Courses in Healthcare Programs 21

Conclusion 22
References 23
Chapter 3: Manuscript #2 31
Abstract 31
Introduction 33
Background 33
Research Question 34
Method 34
Propositions 36
Case Setting 37
Role of the Researcher 38
Data Collected 39
Data Analysis 41
Results 43
Individual Attributes 44
Collective Influences 47
Revision of the Research Question 50
Themes 51
Familiarity and Comfort of Curriculum and Content Change Processes (IA-2 and CI-2) 53
Collaboration with other Healthcare Programs (IA-4, CI-1 and CI-2) 53
Teaching Expertise (IA-1, IA-2 and CI-2) 54
Connections to the Transgender and Gender Diverse Community (IA-3, IA-4, CI-1 and CI-3) 55
Knowledge of Required TGD Content and Gaps in Existing Curriculum (IA-1, IA-2, IA-3, IA-4, CI-1 and CI-3) 55
Access to Supports (IA-4, CI-1 and CI-2) 57
Management of Course Workload and Related Duties (IA-2, IA-4 and CI-2) 58
Discussion 58
The Role of the Institution 59
The Role of Faculty 61
Study Limitations 63
Future Implications 64
Conclusion 65

References 67
Appendix A AU REB approval 75
Appendix B SAIT REB Approval 76
Appendix C Recruitment Poster 77
Appendix D Participant Consent Form 78
Appendix E Interview Guide 80

List of Tables

Chapter 2

Table 1: Themes Identified in the Literature 29

Table 2: Strategies Identified in the Literature. 30

Chapter 3

Table 1: EDI Initiatives on SAIT Campus..... 48

Table 2: Individual Attributes and Collective Influences Relations To Themes..... 52

Table 3: Topics Related to TGD Inclusive Classroom and Content..... 57

Table 4: Document Review 73

Inclusive Terminology

Language use disclaimer:

The language, terminology and acronyms used within this paper are under constant reevaluation. Inclusive language is continually evolving. This paper strives to use updated and currently accepted terminology, but recognizes that this is not always possible when referring to outside sources.

Definitions

Cisgender: a person whose gender identity matches their sex assigned at birth

Gender identity: a person's internal and individual experience of gender

Gender diverse: an umbrella term that is used to describe gender identities that demonstrate a diversity of expression beyond the binary framework.

Non-binary: a person whose gender identity and/or gender expression falls outside the binary categories of man and woman.

Sex assigned at birth: the sex assigned to a child a birth based on external genitalia

Transgender: a person whose gender identity differs from what is typically associated with their sex assigned at birth

Abbreviations

2SLGBTQIA+: Two-Spirit, Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, Intersex, Asexual and additional sexual orientations and gender identities

SGM: Sexual and Gender Minorities

TGNB: Transgender and Gender Non-binary

TGD: Transgender and Gender Diverse

Chapter 1: Integrating Chapter

"Education is the most powerful weapon we can use to change the world." – Nelson Mandela

I was working in a medical imaging department and preparing to take in my next patient, an 11-year-old who required an x-ray of their wrist to rule out a fracture. I went to the change area of the clinic and called for my patient by their first name "Henry". Immediately a mother popped her head out from behind the change room curtain, she looked at me and said: "This is Harriette" as she glanced towards the child. Harriette had her hair tied back in a ponytail, she was wearing purple shorts with sequins, and her nails were painted a pretty pink color. Harriette followed me down the hall into the x-ray room, where I proceeded to confirm her identity with the date of birth and the history on the requisition. Harriette was an outgoing 11-year old, and she chatted about how she had hurt her wrist while playing with her older brother on the couch. The imaging exam itself was unremarkable but the experience and interactions from the case stuck with me. This was my first known encounter with a patient presenting as transgender. Harriette was remarkable without effort, ordinary and extraordinary at the same time, and meeting her has left me with a profound respect for a community that I knew very little about.

After I completed the exam, I continued to ponder over every aspect of the exam. I replayed every word of the conversation and reflected on my own thoughts. I began talking more about my encounter with Harriette to other colleagues and found that many had stories to share about their experiences with transgender and gender diverse patients. Some of my colleagues described the encounters as difficult and awkward. There were questions as to what should be asked when determining pregnancy status, and how to call a patient from the waiting area without outing or dead naming the patient. Some colleagues expressed a sense of frustration during the interactions because they felt they couldn't find the right words or didn't understand

what issues the community faced. Providing imaging care for transgender or gender diverse patients was becoming more common, and by listening to others share their experiences from a technologist's perspective it became evident that there was a lack of awareness and understanding regarding the specific needs of the community.

Transgender and gender diverse folks are a marginalized community, who face many barriers when seeking healthcare. I had little understanding of these barriers when I met Harriette, but as I listened to my colleagues share their stories of patient encounters I began to understand that not all transgender folks shared Harriette's story of an uneventful imaging experience. Transgender and gender diverse folks are subject to discrimination and harassment based on their gender identity and expression. They are denied medical services if their name in use does not match their legal name, or if their gender expression differs from that on their identification documents. The thought that someone could be denied access to healthcare based on these factors was appalling to me. Medical imaging technologists require more education and training in order to provide transgender and gender diverse patients with the care they require and deserve. Healthcare providers have a responsibility to ensure our patients are safe from verbal and physical harm when they are in our care.

With these thoughts I was launched on a new path, that includes educating myself and making changes to my own practice. I began researching and learning more about the challenges that the TGD community experiences during medical imaging encounters. I started recognizing how my cisgender privilege impacted my learning, and I needed to unlearn many of the implicit biases that I had in regard to TGD populations. I continue to be engaged in the ongoing process of reflecting on my biases. I have been involved in projects, presentations, podcasts, and

interviews that have helped me share my knowledge and experiences. I have provided other MRTs with strategies to facilitate more inclusive and safer exam environments for TGD patients.

As an educator in a medical imaging program, I have a responsibility to the students to ensure they graduate with required competencies and skills so they can create safer spaces when providing patient care. I am acutely aware of the impact I have on graduates, as they begin their chosen career as medical imaging technologists. Medical imaging programs must take the necessary steps to ensure the curriculum and program includes specific content and awareness around transgender and gender diverse topics. The burden of responsibility does not fall solely on an individual instructor, rather it is dispersed amongst the educational institution. This includes all faculty, staff, program partners, the campus environment, and connections with the profession. Educational programs must evolve at pace with professional competencies. As research and technical advancements arise, programs strive to mirror these advances in program content and design. The goal is to ensure students are learning current and relevant skills as they prepare to join the profession.

Harriette presented her authentic self during the x-ray exam that day and because of our encounter my path as a healthcare provider and educator changed trajectory. Completing this research study is not my final chapter, although it has laid a solid foundation from which I will continue to grow.

Manuscript Overview

This thesis consists of two separate manuscripts that both focus on learning more about the current state of transgender and gender diverse curricula and content in medical imaging programs. Manuscript 1 highlights the initiatives and strategies that programs are taking to incorporate more TGD content and curriculum into the courses. The first manuscript also highlights some of the barriers that faculty members face when they are creating TGD content, and the manuscript lays the ground work for the study design of Manuscript 2. Manuscript 2 is a single case study of a diagnostic imaging portfolio at a Western Canadian Polytechnic school.

Manuscript 1: Implementation of Transgender and Gender Diverse Curriculum in Medical Imaging Programs - A Review of the Literature.

Transgender and gender diverse folks face many barriers when accessing healthcare. Healthcare providers are not equipped with the required skills and knowledge to provide safe and inclusive care. The lack of TGD curricula and content across healthcare education precludes students and new graduates from bringing an awareness of this community into their own practice.

This literature review seeks to uncover the ways that healthcare programs are currently incorporating TGD content into curricula. A total of 19 papers were included in the review and three overarching themes regarding creation of TGD curriculum were found: educators' acknowledgement of the importance and value of adding sexual and gender minority content to healthcare curriculum; educators' lack of a sense of preparedness, experience, and knowledge to adequately teach the content; and lack of resources and institutional support to help develop curriculum. This manuscript also serves to highlight further areas of research including learning

more about the factors that contribute to educators lacking a sense of ability to incorporate and develop TGD curriculum into courses. Manuscript 1 set the foundation for Manuscript 2.

Manuscript 1 has been published. Pedersen, S., & Corcoran, L. (2021). Implementation of transgender and gender diverse curriculum in medical imaging programs: A review of the literature. *Journal of Medical Imaging and Radiation Sciences*, 52(4), S110–S116. https://doi.org/10.1016/j.jmir.2021.06.005

Manuscript 2: MakeSpaceForEveryone - A Case Study on the Inclusion of Transgender and Gender Diverse Content and Curriculum in Medical Imaging Programs.

This manuscript is a description of a single case study that further explores the barriers described in Manuscript 1 and provides a voice to the faculty members regarding their experiences with TGD content development. The study found that multiple combinations of individual attributes of the faculty members and collective influences of the institution resulted in barriers to TGD content development. These barriers were explored in more detail to provide a clearer image of how they impacted the faculty members. The role of the faculty and the institution were discussed and strategies to overcome the barriers were uncovered to ultimately ensure that future state of medical imaging programs will be able to include more TGD representation and outcomes in the curriculum.

Significance of Findings

This study was designed to gain a better understanding of the factors that currently preclude faculty from developing TGD curriculum. This understanding can lead to an increased sense of empowerment for educators to create and incorporate TGD curriculum in the future.

Many post-secondary institutions are incorporating an inclusive lens to their strategic plans and this research can be used as a resource for future curriculum design projects. Ensuring that the curricula is updated will not only help meet accreditation requirements with updated national competency profiles, but in turn also promote an inclusive learning environment for students. Including TGD curricula in medical imaging programs will better prepare graduates in creating an inclusive and safer space for TGD patients in medical imaging settings.

Study Limitations

The limitations within this research include the nature of the topic under study and the chosen methodology. Of defining importance in case study methodology is that the chosen case is bounded by well-defined borders Adhering to this principle is crucial in maintaining the integrity of the research study, but it also delimits the scope of this study. For these reasons including the voices or experiences of TGD people was outside these boundaries. The topic of TGD populations in healthcare is constantly being reevaluated as new research emerges. This can lead to the potential of findings becoming seemingly outdated relatively quickly. The two manuscripts in this thesis have been under development over the course of 18 months, and during this time there has been more studies completed that could be included as part of these manuscripts and would further enhance the discussions brought forward to provide new perspectives.

Conclusion

The current lack of TGD curricula and content in medical imaging programs has a direct impact on the ability of Medical Radiation Technologists to provide safe and inclusive imaging care for the TGD community. Educational institutions must work with their faculty and stakeholders to ensure there are supports and resources in place that allow faculty to overcome the barriers they are faced with when developing and delivering TGD content. There is a need for increased awareness and strategic institutional priorities to ensure that faculty members feel supported and empowered to make classrooms and curriculum inclusive.

Future Research

Transgender and gender diverse topics in medical imaging is a very niche area with a limited research focus. This master's thesis contributes to the current body of research and can aide in bringing more awareness around the need of further development of TGD content into medical imaging programs.

From an educational perspective, this study can serve as a guide for increasing awareness of, and overcoming factors that, currently impact faculty members in creating and delivering TGD content in medical imaging programs. There are also many parallels that can be drawn to education in other healthcare disciplines, and there is the ability to transfer the learnings and experiences from this case to other institutions and programs.

This research can also be used as a framework to build quality assurance initiatives in the form of curriculum development review projects with a focus on inclusive teaching practices across healthcare programs. It must be noted that any quality assurance initiatives that are brought forward in regard to TGD content or curriculum developments must include

representation from the TGD community. This will help to ensure that any changes remain reflective of and inclusive to the diversity that is seen across the population.

Chapter 2: Manuscript #1:

Implementation of Transgender and Gender Diverse Curriculum in Medical Imaging Programs - A Review of the Literature

Abstract

Introduction: Sexual and gender minority patients experience significant inequities when accessing health care. Transgender and non-binary patients are at an even greater risk of experiencing health disparities due to their specialized health care needs. In the discipline of medical imaging, limited cultural competence, social stigma, and cis-heteronormative environments are barriers for these patients. There is an urgent need to improve medical imaging care for transgender and non-binary people; inclusion of sexual and gender minority content in medical imaging curriculum is one strategy to begin to address this need.

Method: A review of the literature was undertaken to explore implementation of sexual and gender minority content in the curricula of medical imaging programs.

Results/Discussion: Three main themes were identified: 1) educators' acknowledgement of the importance and value of adding sexual and gender minority content to healthcare curriculum; 2) educators' lack of a sense of preparedness, experience, and knowledge to adequately teach this content: and 3) lack of resources and institutional support to help develop curriculum.

Conclusion: Including content in the curriculum related to the needs of transgender and non-binary patients will help ensure entry-to-practice Medical Radiation Technologists are better prepared to provide inclusive care.

Introduction

Over the past decade, research has identified that sexual and gender minority (SGM) patients are faced with numerous barriers when accessing the healthcare system. These barriers can lead to an increase in health disparities within the population (Casey, 2019). It is important to recognize that within the SGM population, transgender and non-binary (TGNB) patients are at an even greater risk of increased health disparities due to their specific health care needs (Scheim & Bauer, 2015). Currently, there is limited reliable data available to determine the size of the TGNB community but it is estimated that between 0.5% - 1.2% of the adult population have a gender identity that differs from their sex assigned at birth (Scheim & Bauer, 2015; Winter et al., 2016). Starting in 2021, Canadian census data will include questions that better reflect sex and gender data (Statistics Canada, 2020) which will lead to more accurate data regarding the prevalence of the TGNB population in Canada. Transgender and gender non-binary patients are faced with discrimination, stigma, microaggressions, and physical violence when seeking medical care (Stowell, 2019). Almost 50% of TGNB participants in the Trans PULSE Canada survey described having a past-year unmet health care need (The Trans PULSE Canada Team, 2020). Transphobia and biases have been acknowledged as a major barrier for TGNB patients in healthcare (McPhail et al., 2016; Stroumsa et al., 2019). To ensure equitable, fair, and safe treatment, health care providers must demonstrate specific competencies when working with TGNB populations (Dickey, 2017; Winter et al., 2016).

A specific focus on TGNB patient experiences during medical imaging procedures has emerged in recent years. Medical imaging exams include a variety of imaging modalities including x-ray, medical resonance imaging (MRI), nuclear medicine (NM), and ultrasound procedures. Floyd et al. (2020) identified a lack of cultural competence, social stigma, and cis-

heteronormative environments as barriers that TGNB patients are faced within radiology departments. A 2020 study of TGNB patient experiences by Grimstad et al. (2020) found that 257/358 (70.8%) of respondents reported having at least one negative imaging encounter. In the same study, nearly one-third of respondents had to take it upon themselves to educate staff in order to receive appropriate care.

Medical Radiation Technologists (MRTs) are healthcare providers that perform diagnostic and therapeutic imaging. It is often required that the MRTs obtain additional patient history prior to an imaging exam and a patient screening questionnaire may need to be completed. The screening process is required to ensure safe practice and provides the technologist with the relevant history needed for documentation purposes. For example, the screening process for general x-ray procedures includes documentation of pregnancy status for the patient and this type of sensitive questioning requires additional awareness with TGNB patients (Pedersen & Sanders, 2018). Some imaging exams are invasive and may lead to patients feeling exposed and uncomfortable; TGNB patients feel particularly vulnerable. The sensitive nature of diagnostic imaging exams can also lead to TGNB patients being inadvertently outed, for example a transgender male patient with an ultrasound requisition experiencing pelvic pain may require a transvaginal probe during the exam. Medical Radiation Technologists are not specifically trained to provide inclusive care to TGNB patients, and many technologists may be unaware for the need to adapt their standard practice to better ensure TGNB patients feel comfortable and safe during imaging exams. There is an overwhelming consensus for the need to improve medical imaging experiences of TGNB people. Literature has identified that additional TGNB training for imaging staff, the creation of inclusive policies/procedures, and ensuring affirming environments as ways to improve patient experiences and health outcomes for TGNB

patients in imaging departments (Aarne Grossman, 2016; Clark et al., 2018; Floyd et al., 2020; Grimstad et al., 2020; Kirkpatrick et al., 2019; Pedersen & Sanders, 2018; Sonnenblick et al., 2018; Sowinski & Gunderman, 2018; Stowell, 2019; van de Venter & Hodgson, 2020). A closer look at how to ensure that TGNB curriculum is incorporated into MRT education is warranted.

Terms and Terminology

The well-known acronym of LGBTQ+ is an umbrella term for lesbian, gay, bisexual, transgender, queer, and additional marginalized identities. Additional letters are continuously being added to enhance inclusivity and awareness of many marginalized communities. As a result, there is no longer a consistent acronym utilized within the scholarly literature. The term sexual and gender minorities (SGM) provides a more consistent term than LGBTQ+ and remains inclusive and representative of the population. Within the SGM population it is important to differentiate and separate sexual orientation from gender identity as they represent two separate aspects of a person and are unrelated and independent of each other (Killermann, 2017; Winter et al., 2016). Sexual orientation is a term used to describe attraction to other people and includes the terms homosexual, pansexual, bisexual and heterosexual orientations. Gender identity refers to a personal own sense of one's gender. Gender identity may be the same as one's sex assigned at birth or may differ. Gender identity is not binary and includes terms such as transgender, non-binary, gender fluid and cisgender. Gender minorities are described as those who do not identify or express the same as their sex assigned at birth and include those who identify as transgender and gender non-conforming. Much of the literature included in this review used a variation of the LGBT+ acronym and therefore a variety of acronyms will be seen throughout this paper when referring to a specific study. Though the papers included in this review use a variety of acronyms to define the groups, this paper will consistently use the terms SGM and TGNB populations.

Methods: Search Terms and Search Strategy

The terms “transgender”, “curriculum”, and “medical imaging” were used as initial search terms and yielded a limited number of studies related to SGM curriculum content in medical imaging programs (Bolderston et al., 2021; Clark & Vealé, 2018; Custer et al., 2020). While it is recognized that there are specific competencies and skills required for medical imaging personnel, with a limited number of available papers, it was logical and relevant to include studies from other healthcare disciplines and programs. To broaden the search, the term “healthcare” was used to replace “medical imaging”, and this led to over 70 search results. It was important to narrow down the number of studies without limiting the scope of this review. To ensure the most current and up-to-date research was included, literature published after 2015 was excluded from the search. After review of abstracts, a total of 19 papers were selected for inclusion in this literature review.

Results

The literature revealed three overarching themes regarding TGNB content in medical imaging programs 1) educators’ acknowledgement of the importance and value of adding SGM content to healthcare curriculum, 2) educators’ lack of a sense of preparedness, experience, and knowledge to adequately teach the content, and 3) lack of resources and institutional support to help develop curriculum. The literature also identified strategies to help programs overcome the barriers. This paper will focus on reviewing current literature relating to curriculum development of TGNB content in medical imaging programs and provide suggested areas for future research to help create and implement TGNB curriculum in medical imaging programs.

Discussion

There is a lack of SGM focused curriculum across healthcare programs including nursing and medical school programs (Dubin et al., 2018; Korpaisarn & Safer, 2018; Lim et al., 2015; McCann & Brown, 2018; Parameshwaran et al., 2017; Pratt-Chapman, 2020). Time devoted to SGM content was minimal across healthcare programs (Lim et al., 2015). Korpaisarn and Safer (2018) stated that "education among healthcare providers still lags behind and remains the key barrier to care for transgender individuals" (p. 274). A recent study conducted by the University of Alberta Radiation Therapy Program found that three out of ten faculty members included LGBTQ2S+ topics in their courses (Bolderston et al., 2021). Two studies from the United States looked specifically at TGNB content in medical imaging programs (Clark & Vealé, 2018; Custer et al., 2020). The study by Clark and Vealé (2018) assessed transgender-related content in radiography programs using faculty members as participants and Custer et al. (2020) assessed the educational climate by using educational program directors in the study. The studies showed that 32.6% of faculty included considerations related to transgender patients into radiography curriculum (Clark & Vealé, 2018) and 56% of the surveyed programs in the United States did not include TGNB content in their curriculum (Custer et al., 2020) . Both studies highlighted that limited faculty knowledge and limited awareness of transgender populations as barriers to including TGNB curriculum. The studies concluded that further strategies and training may improve educators' abilities to incorporate TGNB content into the program (Clark & Vealé, 2018; Custer et al., 2020).

Theme 1: Importance and Value of SGM Curriculum in Healthcare Programs

The first theme that emerged from the literature was that educators acknowledged the importance and value of adding SGM content to healthcare curriculum. Custer et al., (2020)

stated “Program directors believed in the importance of incorporating imaging content related to transgender patients into their curricula yet lacked knowledge and resources” (p. 541). Clark and Veale (2018) found that 73.5% of participants considered it important to incorporate transgender-related content into the radiography curriculum. The importance of including TGNB curriculum is further substantiated in a recent report from the Standing Committee on Health which put forward a list of recommendations aimed at improving the health outcomes of the Canadian LGBTQIA2 population (Casey, 2019). Recommendation Five in the report stated that provincial health professionals and regulatory bodies should work with the Government of Canada to promote training and education of healthcare professionals regarding the health needs of sexual and gender minorities (Casey, 2019).

In Canada, post-secondary curriculum is developed in accordance with the national competency profile developed by the Canadian Association of Medical radiation technologists (CAMRT). The CAMRT is responsible for developing and updating the National Competency Profile for MRTs in Canada. The competency profile “describes the practice requirements of MRTs at entry-to-practice, to provide safe, effective, compassionate and ethical patient care” (Canadian Association of Medical Radiation Technologists, 2020). An update to the CAMRT National Competency Profile for MRTs will take effect in 2024. It will include competencies with specific outcomes related to patient diversities which aligns with the recommendation from the Standing Committee on Health. Accredited educational programs must adhere to the competency profile and use it to shape curriculum content (Canadian Association of Medical Radiation Technologists, 2020). New objectives must be incorporated into the curriculum to ensure graduates writing the certification exam from May 2024 onward meet the new requirements for entry-to-practice.

The updated CAMRT competency profile, recent release of the report from Standing committee, and evidence of support from educators and program directors all point to the need for an increase to TGNB curriculum in medical imaging programs. It is important to further understand and explore the barriers identified by educators that impact their ability to include TGNB specific outcomes in course content.

Theme 2: Preparedness, Experience, and Knowledge to Teach SGM Content

The first barrier to incorporating TGNB curriculum into medical imaging programs identified in the literature was the educators' lack of a sense of preparedness, experience, and knowledge to adequately teach the content (Clark & Vealé, 2018; Custer et al., 2020; Lim et al., 2015; McPhail et al., 2016; Noonan et al., 2018). Lim et al. (2015) completed a survey assessing faculty knowledge, experience, and readiness to teach LGBT health in nursing; Clark and Veale (2018) created a similar survey to determine radiography educators' knowledge, awareness, and preparedness to teach transgender-related content in imaging programs. The study by Clark and Veale included 325 participants and results demonstrated that approximately 75% of participants were limited in their knowledge, awareness, and preparedness of TGNB content (2018). The results from Lim et al. (2015) showed a slightly higher sense of knowledge and preparedness to teach LGBT curriculum in nursing programs which may be attributed to the fact that the study did not solely focus on transgender content. By combining SGM terms in their study, Lim et al. did not differentiate the variations of attributes as they relate to sexual orientation versus gender identity.

Studies have indicated that the lack of willingness to teach SGM and TGNB content may be attributed to varying thoughts and belief systems of faculty (Clark & Vealé, 2018; Custer et al., 2020; Lim et al., 2015). McPhail et al. (2016) discussed the importance of addressing

systemic transphobia by including anti-transphobia education within medical training. Another study identified that "faculty recognize the gap in their own knowledge and are willing to participate in transgender health education programs" (Noonan et al., 2018, p. 127). Two studies discussed strategies to help faculty overcome barriers to incorporating SGM content into curriculum (Noonan et al., 2018; Ton et al., 2016). Noonan et al. (2018) used a World-Café style forum to facilitate large group discussions and included faculty, staff, medical students as well as community health practitioners and community members. During the forum, curriculum leaders and clinical educators learned from the experiences shared by community members. The community engagement approach was found to be a valuable way to "educate faculty and curricula developers about the lived experiences of the local transgender community" (Noonan et as., 2018, p. 127). The study concluded that healthcare programs can benefit by implementing the community engagement model used in the study to inform curriculum development. The study by Ton et al. (2016) used a one-day curriculum retreat to help faculty members plan sexual orientation and gender identity (SOGI) curriculum across a four-year undergrad medical education. The retreat served as a training platform for participants to learn more about SOGI-themed educational resources and served to motivate participants to support SOGI-themed curricular efforts. Though this study was not specific to TGNB curriculum development it demonstrated a method to help support faculty in overcoming some of the barriers associated with creating and implementing new curriculum. Follow-up data from the retreat showed a 76% implementation rate of the proposed SOGI content into curriculum (Ton et al., 2016). The lack of knowledge and experience with TGNB patients has been identified as a barrier to implementing TGNB content. These two studies provide strategies that can help improve educators' knowledge

and experience with TGNB patients and may lead to increased TGNB curriculum in medical imaging programs.

Theme 3: Lack of Institutional Support

A study by Custer et al. (2020) focused specifically on the opinions of program directors as it related to transgender content in curriculum. The study showed that 67% of program directors reported no discussion of adding transgender content into program curriculum. This finding is consistent with studies that have shown that faculty perceive a lack of institutional supports (Lim et al., 2015; Pratt-Chapman, 2020). In contrast to some studies, Custer et al. (2020) found positive faculty comments regarding "support for content inclusion in the curriculum, and requests for resources or information to enable faculty to begin including these topics in their curriculum" (p. 541). The literature also identified the importance of cultivating institutional champions and involving faculty expertise into the curriculum development process (Holthouser et al., 2017; Pratt-Chapman, 2020; Solotke et al., 2019).

If educational institutions are to rely on faculty champions and utilize the expertise within the faculty, there must be a commitment by leadership to support those faculty members with additional resources. It cannot be an expectation that faculty members with additional expertise and interest in TGNB curriculum are left to create and teach the new curriculum without support from their leaders. A significant level of institutional support is required to create learning opportunities and ensure that faculty can participate in educational offerings. Without broad institutional support it will not only be challenging to create, but also to maintain, a shift in program development as changes in curriculum as it would be dependent on individual faculty members taking it upon themselves to make the required changes (Custer et al., 2020). Support at

the institutional level would provide educators with access to the resources needed to make meaningful and accurate curriculum changes to medical imaging programs (Solotke et al., 2019).

The literature identified that educators do not feel they have the required expertise or knowledge to provide students with TGNB content needed to improve healthcare outcomes for patients (Clark & Vealé, 2018; Holthouser et al., 2017; Solotke et al., 2019). It was also identified that the educators felt a lack of institutional support in developing TGNB curriculum (Custer et al., 2020). These barriers result in the continued lack of TGNB outcomes in curriculum. Acknowledgement of these barriers is a critical step forward in overcoming them.

Strategies to Better Include SGM Content in Healthcare Curriculum

As evidenced by the literature, the barriers to incorporation of TGNB curriculum into medical imaging programs is two-pronged. A closer look at studies that focus on strategies to incorporate SGM in healthcare programs is warranted. Seven studies were identified that discussed methods currently used by healthcare programs to incorporate SGM content into course curriculum (Bolderston et al., 2021; Braun et al., 2017; Grosz et al., 2017; Holthouser et al., 2017; MacKinnon et al., 2021; Pratt-Chapman, 2020; Solotke et al., 2019). Two strategies of SGM teaching emerged from the literature: 1) creation of stand-alone workshops/forums, and 2) integration of outcomes throughout program curriculum, and each will be discussed in more detail below.

Stand-Alone SGM Workshops

Two of the studies created a separate learning opportunity in response to the lack of SGM content in healthcare programs (Braun et al., 2017; Grosz et al., 2017). The study by Braun et al. (2017) described an LGBTQI elective health forum developed at the University of California, San Francisco. The forum's audience was interdisciplinary; it was comprised of medical, dental,

pharmacy, nursing, and physical therapy students. Over time, the forum developed into a 10-hour weekend elective course. Initial data collected from 273 participants in the 2015-16 course showed that 44% of participants identified as part of the LQBTQI community. This rate is far above the national population average of the community, and participants in the elective forum may not reflect the general makeup of the student population in healthcare programs. In the study by Grotz et al., a two-hour mandatory LGBT session was provided to 167 first-year medical students at Case Western Reserve University School of Medicine in Cleveland, Ohio. This was a mandatory course, and the participant group was more reflective of the student body than the study by Braun et al. (2017). Both workshops included involvement with community members in the form of panel discussions and/or keynote speakers. Participants expressed satisfaction with the forums and initial data from both forums demonstrated an increased understanding of LGBT+ terminology by participants as well as an increase in perceived confidence providing care to patients within the community (Braun et al., 2017; Grosz et al., 2017). Participants in the elective course had an over representation of self-identified LGBTQ community members compared to the general student population and barriers to enrollment were identified in the study. The elective course was structured as a weekend commitment and participants perceived minimal value of formal recognition of completion. The advantage of the mandatory course is that all students are required to attend and therefore participation is not impacted by personal beliefs and values. Ensuring that the curriculum is mandatory will address issues related to aversion from students due to transphobia and implicit biases that may otherwise deter students from participating in these learning opportunities.

Integration of SGM Curriculum Across Courses in Healthcare Programs

Five papers were reviewed that discussed the need for embedding SGM topics across courses in healthcare program curriculum (Bolderston et al., 2021; Holthouser et al., 2017; MacKinnon et al., 2021; Pratt-Chapman, 2020; Solotke et al., 2019). Solotke et al. (2019, p. 142) included this guideline: "Distribute SGM health content across the curriculum." A study by Pratt-Chapman (2020) stated the importance of layering teachable moments. All five of the studies agreed that creating a common language for SGM terminology across the program would help establish the foundational knowledge for students when they first begin their education (Bolderston et al., 2021; Holthouser et al., 2017; MacKinnon et al., 2021; Pratt-Chapman, 2020; Solotke et al., 2019). Students may enter post-secondary education with varying levels of awareness and experiences related to SGM populations and it is crucial that students have some foundational knowledge that will be applied throughout the program. It is also important to continually revise and reflect on the terminology being used as it is frequently evolving to better reflect the community. By integrating TGNB curriculum within all courses rather than as a stand-alone course there is an opportunity to address the cis-normativity that is currently embedded in many healthcare programs (MacKinnon et al., 2021). Students will experience an increase in exposure to TGNB populations with the introduction of TGNB content in a variety of courses across a program and this can lead to a better understanding of the specific needs the TGNB population requires from healthcare providers.

The decision as to which of the two methods to use to increase TGNB content in medical imaging programs is dependent on a variety of factors. There is a need to explore the specific programs' available resources in terms of both leadership support and faculty experience prior to determining which direction is most viable.

Conclusion

An increased awareness of the specific healthcare needs that TGNB populations require during medical imaging exams requires specific competencies and knowledge of the MRT. Educators recognize the need to increase and implement TGNB specific content in medical imaging programs, and with the upcoming implementation of the 2024 CAMRT competency profile there will be a requirement for Canadian medical imaging programs to review, revise, and enhance TGNB curriculum across post-secondary MRT programs. Including content related to TGNB in the curriculum will help ensure the entry-to-practice MRT meets the requirements in the CAMRT competency profile and will also better prepare graduates to provide safe and inclusive care to TGNB patients. Educators currently feel that their lack of knowledge and awareness of the TGNB population as a barrier to implement TGNB curriculum. Lack of institutional support was also identified as a hindrance to developing the required curriculum revisions. Including TGNB community members into educational opportunities for faculty members may increase the educators' knowledge and sense of preparedness to teach TGNB content in programs. This literature review has identified the following areas for further research:

1. What factors contribute to the educators' sense of a lack of preparedness, experience, and knowledge related to TGNB populations that has been identified in the literature?
2. How are educators' sense of preparedness, experience, and knowledge related to TGNB populations impacted by attending learning opportunities directly supported by the educational institution?
3. Will an increase in the educators' sense of preparedness, experience, and knowledge related to TGNB populations influence the educators' ability to create and implement TGNB curriculum across medical imaging programs?

References

Aarne Grossman, V. G. (2016). Providing quality care to the transgender patient in the radiology setting. *Journal of Radiology Nursing*, *35*(3), 218–226. https://doi.org/10.1016/j.jradnu.2016.06.002

Bolderston, A., Middleton, J., Palmaria, C., Cauti, S., & Fawcett, S. (2021). Improving Lesbian, Gay, Bisexual, Transgender, Queer and Two-Spirit content in a radiation therapy undergraduate curriculum. *Journal of Medical Imaging and Radiation Sciences*, Advance online publication. https://doi.org/10.1016/j.jmir.2021.01.001

Braun, H. M., Ramirez, D., Zahner, G. J., Gillis-Buck, E. M., Sheriff, H., & Ferrone, M. (2017). The LGBTQI health forum: An innovative interprofessional initiative to support curriculum reform. *Medical Education Online*, *22*(1). https://doi.org/10.1080/10872981.2017.1306419

Canadian Association of Medical Radiation Technologists. (2020). *National Competency Profile for Entry-Level Medical Radiation Technologists*. https://www.camrt.ca/wp-content/uploads/2020/03/RTR-Companion-2019_FINAL.pdf

Casey, B. (2019). *The Health of LGBTQIA2 Communities in Canada: Report of the Standing Committee on Health*. House of Commons Canada. https://www.ourcommons.ca/DocumentViewer/en/42-1/HESA/report-28/

Clark, K. R., & Vealé, B. L. (2018). Assessing transgender-related content in radiography programs in the United States: A survey of educators. *Journal of Medical Imaging and Radiation Sciences*, *49*(4), 414–419. https://doi.org/10.1016/j.jmir.2018.06.050

Clark, K. R., Vealé, B. L., & Zaleski, F. A. (2018). Caring for the transgender patient. *Radiologic Technology*, *90*(1), 7–19. https://doi.org/10.7326/AITC201907020

Custer, T., Sayles, H., & Michael, K. (2020). Assessing the educational climate: Transgender content in medical imaging curricula. *Journal of Diagnostic Medical Sonography*, *36*(6), 536–543. https://doi.org/10.1177/8756479320944930

Dickey, L. M. (2017). Toward developing clinical competence: Improving health care of gender diverse people. *American Journal of Public Health*, *107*(2), 222–223. https://doi.org/10.2105/AJPH.2016.303581

Dubin, S. N., Nolan, I. T., Streed, C. G., Greene, R. E., Radix, A. E., & Morrison, S. D. (2018). Transgender health care: Improving medical students' and residents' training and awareness. *Advances in Medical Education and Practice*, *9*, 377–391. https://doi.org/10.2147/AMEP.S147183

Floyd, M. J., Martin, O., & Eckloff, K. J. (2020). A qualitative study of transgender individuals' experiences of healthcare including radiology. *Radiography*, *26*(2), e38–e44. https://doi.org/10.1016/j.radi.2019.10.008

Grimstad, F. W., Stowell, J. T., & Gaddis, M. (2020). Survey of experiences of transgender and gender nonbinary patients during imaging encounters and opportunities for improvement. *American Journal of Roentgenology*, *215*(5), 1136–1142. https://doi.org/10.2214/AJR.19.22558

Grosz, A. M., Gutierrez, D., Lui, A. A., Chang, J. J., Cole-Kelly, K., & Ng, H. (2017). A student-led introduction to Lesbian, Gay, Bisexual, and Transgender health for first-year medical students. *Family Medicine*, *49*(1), 52–56. https://pubmed.ncbi.nlm.nih.gov/28166581/

Holthouser, A., Sawning, S., Leslie, K. F., Faye Jones, V., Steinbock, S., Noonan, E. J., Martin, L. J., Weingartner, L. A., Potter, J., Davis, J., Eckstrand, K. L., & Ann Shaw, M. (2017). eQuality: A process model to develop an integrated, comprehensive medical education curriculum for LGBT, gender nonconforming, and DSD health. *Medical Science Educator*, *27*(2), 371–383. https://doi.org/10.1007/s40670-017-0393-5

Killermann, S. (2017). *The Genderbread Person version 4*. It's Pronounced Metrosexual. https://www.itspronouncedmetrosexual.com/2018/10/the-genderbread-person-v4/

Kirkpatrick, D. L., Stowell, J., Grimstad, F., Brown, E., Fishback, S., & Lemons, S. (2019). Creating a transgender-inclusive interventional radiology department. *Journal of Vascular and Interventional Radiology*, *30*(6), 928–931. https://doi.org/10.1016/j.jvir.2018.12.033

Korpaisarn, S., & Safer, J. D. (2018). Gaps in transgender medical education among healthcare providers: A major barrier to care for transgender persons. *Reviews in Endocrine and Metabolic Disorders*, *19*(3), 271–275. https://doi.org/10.1007/s11154-018-9452-5

Lim, F., Johnson, M., & Eliason, M. (2015). A national survey of faculty knowledge, experience, and readiness for teaching Lesbian, Gay, Bisexual, and Transgender health in baccalaureate nursing programs. *Nursing Education Perspectives (National League for Nursing)*, *36*(3), 144–152. https://doi.org/10.5480/14-1355

MacKinnon, K. R., Kia, H., Rai, N., Abramovich, A., & Cheung, J. J. H. (2021). Integrating trans health knowledge through instructional design: Preparing learners for a continent – not an island – of primary care with trans people. *Education for Primary Care*, 1–4. https://doi.org/10.1080/14739879.2021.1882885

McCann, E., & Brown, M. (2018). The inclusion of LGBT+ health issues within undergraduate healthcare education and professional training programmes: A systematic review. *Nurse Education Today*, *64*, 204–214. https://doi.org/10.1016/j.nedt.2018.02.028

McPhail, D., Rountree-James, M., & Whetter, I. (2016). Addressing gaps in physician knowledge regarding transgender health and healthcare through medical education. *Canadian Medical Education Journal*, *7*(2), e70–e78.

Noonan, E. J., Sawning, S., Combs, R., Weingartner, L. A., Martin, L. J., Jones, V. F., & Holthouser, A. (2018). Engaging the transgender community to improve medical education and prioritize healthcare initiatives. *Teaching and Learning in Medicine*, *30*(2), 119–132. https://doi.org/10.1080/10401334.2017.1365718

Parameshwaran, V., Cockbain, B. C., Hillyard, M., & Price, J. R. (2017). Is the lack of specific Lesbian, Gay, Bisexual, Transgender and Queer/Questioning (LGBTQ) health care education in medical school a cause for concern? Evidence from a survey of knowledge and practice among UK medical students. *Journal of Homosexuality*, *64*(3), 367–381. https://doi.org/10.1080/00918369.2016.1190218

Pedersen, S., & Sanders, V. (2018). A new and inclusive intake form for diagnostic imaging departments. *Journal of Medical Imaging and Radiation Sciences*, *49*(4), 371–375. https://doi.org/10.1016/j.jmir.2018.10.001

Pratt-Chapman, M. L. (2020). Implementation of sexual and gender minority health curricula in health care professional schools: A qualitative study. *BMC Medical Education*, *20*(1), 138. https://doi.org/10.1186/s12909-020-02045-0

Scheim, A. I., & Bauer, G. R. (2015). Sex and gender diversity among transgender persons in Ontario, Canada: Results from a respondent-driven sampling survey. *The Journal of Sex Research*, *52*(1), 1–14. https://doi.org/10.1080/00224499.2014.893553

Solotke, M., Sitkin, N. A., Schwartz, M. L., & Encandela, J. A. (2019). Twelve tips for incorporating and teaching sexual and gender minority health in medical school curricula. *Medical Teacher*, *41*(2), 141–146. https://doi.org/10.1080/0142159X.2017.1407867

Sonnenblick, E. B., Shah, A. D., Goldstein, Z., & Reisman, T. (2018). Breast imaging of transgender individuals: A review. *Current Radiology Reports*, *6*(1). https://doi.org/10.1007/s40134-018-0260-1

Sowinski, J. S., & Gunderman, R. B. (2018). Transgender patients: What radiologists need to know. *American Journal of Roentgenology*, *210*(5), 1106–1110. https://doi.org/10.2214/AJR.17.18904

Statistics Canada. (2020). *Sex at birth and gender: Technical report on changes for the 2021 Census*. https://www12.statcan.gc.ca/census-recensement/2021/ref/98-20-0002/982000022020002-eng.pdf

Stowell, J. T. (2019). Serving the needs of transgender and gender-diverse persons in radiology. *Journal of the American College of Radiology*, *16*(4), 533–535. https://doi.org/10.1016/j.jacr.2018.12.050

Stroumsa, D., Shires, D. A., Richardson, C. R., Jaffee, K. D., & Woodford, M. R. (2019). Transphobia rather than education predicts provider knowledge of transgender health care. *Medical Education*, *53*(4), 398–407. https://doi.org/10.1111/medu.13796

The Trans PULSE Canada Team. (2020). *QuickStat #2 – Primary care and unmet health care needs*. https://transpulsecanada.ca/research-type/quickstats/

Ton, H., Eidson-Ton, W. S., Iosif, A.-M., Sitkin, N., Henderson, S., & Callahan, E. J. (2016). Using a retreat to develop a 4-year sexual orientation and gender identity curriculum. *Academic Psychiatry*, *40*(5), 796–801. https://doi.org/10.1007/s40596-015-0474-y

van de Venter, R., & Hodgson, H. (2020). Strategies for inclusive medical imaging environments for sexual and gender minority patients and radiographers: An integrative literature review. *Journal of Medical Imaging and Radiation Sciences*. https://doi.org/10.1016/j.jmir.2020.05.009

Winter, S., Diamond, M., Green, J., Karasic, D., Reed, T., Whittle, S., & Wylie, K. (2016). Transgender people: Health at the margins of society. *The Lancet*, *388*(10042), 390–400. https://doi.org/10.1016/S0140-6736(16)00683-8

Table 1

Themes Identified in the Literature

Themes	Authors	Disciplines
Educators' acknowledgement of the importance and value of adding SGM content to healthcare curriculum	• Casey 2019 • Clark & Vealé 2018 • Custer et al 2020	Medical Imaging Technologists Healthcare Professionals • administrative staff, care attendants, nurses, physicians, psychologists, and social workers
Educators' lack of a sense of preparedness, experience, and knowledge to adequately teach the content	• McPhail et al 2016 • Clark & Vealé 2018 • Custer et al 2020 • Lim et al 2015 • Noonan et al 2018	Medical Imaging Technologists Medicine Nursing
Lack of resources and institutional support to help develop curriculum	• Custer et al 2020 • Lim et al 2015 • Pratt-Chapman 2020 • Holthouser et al 2017 • Solotke et al 2019	Medical Imaging Technologists Medicine Nursing Pharmacy

Table 2

Strategies Identified in the Literature

Strategies	Authors	Disciplines
Stand-Alone SGM workshops	• Braun et al 2017 • Grosz et al 2017	Medicine Nursing Dentistry Pharmacy Physical Therapy
Integration of SGM Curriculum Across Courses in Healthcare Programs	• Bolderston et al 2021 • Pratt-Chapman 2020 • Holthouser et al 2017 • Solotke et al 2019 • MacKinnon et al 2021	Radiation Therapy Medicine Nursing Pharmacy

Chapter 3: Manuscript #2

MakeSpaceForEveryone - A case study on the inclusion of transgender and gender diverse content and curriculum in medical imaging programs.

Abstract

Background: Transgender and gender diverse (TGD) individuals face numerous barriers, including harassment and discrimination, when accessing healthcare services. Many medical imaging procedures require personal information to be shared, such as date of last menstrual cycle and/or pregnancy status; some imaging exams are also invasive or intimate in nature. Terminology is based on binary sex creating a inherently cis-normative environment. TGD patients fear being outed and often feel a need to act as educators and advocates for their care. Incorporation of inclusive healthcare curriculum related to TGD populations is an effective means of educating new health providers and promotes safer and more inclusive spaces in healthcare settings. Educators face numerous barriers which hinder the creation and implementation of TGD content.

Research Question: How do individual attributes and collective influences impact educators when they are developing and delivering transgender and gender diverse content in medical imaging programs?

Methodology: An exploratory single case study of medical imaging programs at a Canadian post-secondary institute was undertaken. Semi-structured interviews with faculty members along with institutional documents were analyzed.

Results: The study found seven themes that influence the development of TGD curriculum as follows: familiarity and comfort with curriculum and content change process; collaboration with other healthcare programs; teaching expertise; management of course workload and related

duties; connections to the transgender and gender diverse community; knowledge of required transgender and gender diverse content and existing gaps in curriculum; access to supports. *Implications:* Understanding educators' perspectives can lead to an increased sense of empowerment for them to create and incorporate TGD curriculum in the future. Many post-secondary institutions are incorporating an inclusive lens to educational plans and this research can be used in future curriculum design projects. The ultimate goal is improved medical imaging experiences for the TGD population.

Keywords: medical imaging education, transgender, gender diverse, curriculum, content development

Introduction

There is an overwhelming consensus for the need to improve medical imaging experiences of transgender and gender diverse (TGD) people. Research has shown that TGD curriculum across healthcare programs, including medical imaging programs is inadequate (Bolderston et al., 2021; Clark & Vealé, 2018; Custer et al., 2020; Dubin et al., 2018; Korpaisarn & Safer, 2018; Lim et al., 2015). It is imperative that educational institutions begin to incorporate TGD curriculum into program outcomes. By including TGD curricula into educational programs graduates will be better prepared to provide safer and inclusive environments for this marginalized group which can potentially lead to better health outcomes. A robust understanding of the barriers that faculty face when trying to develop TGD content is needed to ensure that TGD curricula is incorporated into Medical Radiologic Technology (MRT) education.

Background

Transgender and gender diverse patients are often faced with discrimination, stigma, microaggressions, and physical violence when seeking medical care (Stowell, 2019). Almost 50% of TGD participants in the Trans PULSE Canada survey described having an unmet health care need in the past year (The Trans PULSE Canada Team, 2020). Transphobia and biases have been acknowledged as a major barrier for TGD patients in healthcare (McPhail et al., 2016; Stroumsa et al., 2019). To ensure equitable, fair, and safe treatment, health care providers must demonstrate specific competencies when working with TGD populations (Dickey, 2017; Winter et al., 2016). Floyd et al. (2020) identified a lack of cultural competence, social stigma, and cis-heteronormative environments as barriers that TGD patients are faced with in radiology departments. A 2020 study of transgender and gender nonbinary (TGNB) patient experiences by Grimstad et al. (2020) found that 70.8% of respondents reported having at least one negative

imaging encounter. In the same study, nearly one-third of respondents had to take it upon themselves to educate staff in order to receive appropriate care.

A literature review by Pedersen and Corcoran (2021) investigated the current state of implementation of TGD curriculum in medical imaging programs. Three themes emerged from the literature review: educators acknowledge the importance and value of adding sexual and gender minority content to curriculum; educators' lack of a sense of preparedness and knowledge to adequately teach this content; and a lack of resources and institutional support to help develop the curriculum (Pedersen & Corcoran, 2021). Several areas of future research were also highlighted in the same study. Educators currently feel that their lack of knowledge and awareness of the TGD population is a barrier to the implementation of TGD curriculum. Lack of institutional support was also identified as a hindrance to developing the required curriculum revisions.

There is a gap in TGD content and curriculum in medical imaging programs, but there is also lack of focus on why educators are not incorporating this type of content into their courses (Pedersen & Corcoran, 2021). There is a need for further exploration to learn more about these phenomena. This study will lead to a deeper understanding of the issue and is a path to finding solutions to this problem.

Research Question

How do factors impact educators when they are creating and delivering transgender and gender diverse content into medical imaging programs?

Method

The implementation of TGD curriculum development in healthcare education, and specifically in medical imaging programs is understudied. Case study methodology is well suited

for this research as it can be used to develop theory, evaluate programs, and develop interventions (Baxter & Jack, 2008) and it is fitting for early, exploratory research where there is minimal understanding of the variables or phenomena (Ebneyamini & Sadeghi Moghadam, 2018). This research methodology is used to explore a phenomenon to obtain an in-depth appreciation of an issue in its natural real-life context (Crowe et al., 2011). Various scholars have described case study methodology as "… finding a topic that lends itself to in-depth analysis in a natural context using multiple sources of information"(Hancock & Algozzine, 2016, p.16), "an intensive study of a single unit with the purpose of understanding a larger class with (similar) units" (Gerring, 2004, p.342), and also "a study that investigates a contemporary phenomenon in-depth in its real-world context" (Yin, 2014, p.16). Case studies are used in a variety of disciplines, including health sciences, education, and social sciences – with examples in cases looking at an individual, small groups, or institutions. It provides a framework in which individuals, groups, or issues can be explored through various lenses and it results in deep, multi-layered data to explain a phenomenon in real-life context.

The literature review revealed three areas for further exploration. These areas were all broad and generic. In using case study, the research question evolves from a broad and/or vague question to a narrower question with specific theories over time as the researcher gains experience and knowledge with the topic (Swanborn, 2018). For this study, I chose to look closer at the findings from the literature review and focus on how the factors influence educators when they are creating and delivering TGD content in their courses. According to Yin (2014) a case study is well suited to investigate research questions that are focused on "how" and "why". Researchers must look at the overall purpose of their study to determine the specific type of case study best suited for their project.

A crucial step in the design process of a case study is defining and bounding the case (Harrison et al., 2017). The case is the main subject of study – usually a concrete entity and also described as the unit of analysis (Baxter & Jack, 2008; Yin, 2014). Of importance is that the case can be bounded by well-defined borders. These borders can be created by time/space, time/activity or definition/context (Baxter & Jack, 2008). Binding the case will answer the question, "What is this a case of?', and narrows the focus of the case (Mohammed, 2018). Placing boundaries on the case helps avoid answering a research question that is too broad (Baxter & Jack, 2008). The boundaries indicate what will and will not be studied in the scope of the case study. Binding a case can be done by applying concise definitions to the case. This will ensure that the case study remains within a reasonable scope (Baxter & Jack, 2008).

Yin (2014) refers to the three types of case study: explaining, exploring, or describing a specific phenomenon. The purpose of exploratory case studies to explore situations in which there is no clear or defined outcomes (Baxter & Jack, 2008), and can be seen as a type of pilot study to inform subsequent research (Pearson et al., 2015). Case study plays an important role in advancing a field's knowledge base. This research study is an exploratory case study of medical imaging programs bounded in a diagnostic imaging portfolio at one Canadian post-secondary institution.

Propositions

Propositions can be identified by the researcher through the initial literature review or by way of personal and professional experiences (Baxter & Jack, 2008). Propositions increase the likelihood that the researcher will be able to place limits on the scope of the study and increases the study feasibility (Baxter & Jack, 2008). Yin (2014) stated that propositions are necessary elements leading to the development of a conceptual framework that guides the research (Baxter

& Jack, 2008). Propositions are a valuable component of case study research design as they direct attention towards an area that warrants investigation within the scope of study (Yin, 2014). In this case study, I have identified the following propositions regarding the educators under study: lack of knowledge/familiarity with TGD content; lack of institutional support to make changes to content and curriculum; lack of personal connection to the TGD community; lack of perceived value of TGD content

Case Setting

This exploratory single case study was completed at the Southern Alberta Institute of Technology (SAIT). SAIT is a polytechnic institute located in Calgary, Alberta. Established in 1916, SAIT is Canada's first publicly funded technical institute. SAIT offers a total of 54 diploma programs and six degree programs as well as a variety of trades and technical certificates. The diagnostic imaging (DI) portfolio is housed within the School of Health and Public Safety and encompasses three separate programs: Diagnostic Medical Sonography (DMS), Medical Radiologic Technology (MRT), and Nuclear Medicine Technology (NMT). All three programs are accredited under the EQual program (Accreditation Canada, 2022).

The MRT program started in 2003. It is a 22-month diploma program with an intake of 40 students/fall term and seven faculty positions. The DMS program started in 2001, currently it is a 26-month diploma program with an intake of 32 students/fall term and seven faculty positions. The NMT program started in 1990, currently it is a 22-month diploma program with an intake of 22 students/fall term and five faculty positions. Contractor and adjunct faculty positions are utilized in all three programs and the DI Portfolio also has two education technologist positions. The DI portfolio is led by the Academic Chair and has one administrative assistant.

Role of the Researcher

As an imaging technologist, I know that many of my colleagues feel they lack resources and tools when they are providing care for TGD patients. This is similar to the feelings I had during the exam of 11-year-old Harriette. My previous scholarship has focused on creating resources for technologists to help them create safer and a more inclusive environment for TGD patients in the medical imaging setting. In case study research, the researcher is typically immersed fully in the work and must recognize and address any personal biases that may impact the study (Hancock & Algozzine, 2016). I have in-depth understanding of the topic being studied and I am also a faculty member at the institution where the case study is taking place, making me insider researcher in this study. An insider research can be defined as someone is a member of the group that is under study (Dwyer & Buckle, 2009).

The insider position comes with benefits and pitfalls. The pre-established relationships with the participants can lead to a sense of safety for the participants when discussing sensitive topics, but at the same time it can also lead to blurring of the delineation of the researcher's role (Dwyer & Buckle, 2009). The researcher has an ease of access and familiarity to the pool of participants and must therefor be cognizant of potential selection bias (Caruana, 2015). In order to ensure impartiality during the analysis and interpretation stage of the study, the researcher must identify and strive to reduce any impact this position may have (Hancock & Algozzine, 2016). During the data analysis process, it is imperative that the researcher brackets themselves. Bracketing refers to identifying what is expected to be discovered and then intentionally setting those ideas aside to ensure that the data collected is analyzed without pre-assumptions or influences (Tufford & Newman, 2012). To bracket my pre-assumptions as an educator I used various tools including reflective journaling and periodic discussions with my supervisor. This

help to ensure that I was continually checking in with myself, recognizing, and potentially minimizing the influence of my experiences and background.

Data Collected

This study utilized two separate data sources. In case study methodology, the utilization of multiple data sources leads to triangulation of data and enhances the reliability of the study (Hancock & Algozzine, 2016). In this study, the data was collected via institutional documents and semi-structured interviews with faculty members of the DI portfolio at SAIT.

Institutional Documents. Documents provide a deep source of information that may enhance the data collected through interviews (Hancock & Algozzine, 2016). In this study, I reviewed current public institutional and disciplinary documents from the post-secondary institution. Reviewed documents helped me gain insight of the equity, diversity, and inclusion (EDI) strategy from an institutional perspective. Searches were completed on the SAIT website and yielded several documents and resources relating to EDI topics at SAIT. A review of SAIT social media platforms was also undertaken between the period of May 1- June 30, 2022. Program specific documents linked to curriculum development were utilized in this study. This included SAIT specific policies and procedures as well as disciplinary documents from professional associations and accrediting bodies. A full list of the reviewed documents can be found in Table 4.

Semi-Structured Interviews. This study was approved by both the Athabasca University Research Ethics Board and SAIT Research Ethics Board. Certificates of approval for Research Involving Human Subjects were received prior to the start of the recruitment process of participants (see Appendix A and B).

Sampling. Interview participants were selected by criterion sampling. Criterion sampling is a type of purposive sampling where specific criterion are identified to ensure that participants selected have the best information to address the research question (Hancock & Algozzine, 2016). This enables the researcher to study the phenomena in depth and with emphasis. The participant criteria identified in this study is:

- current faculty members of a medical imaging program at SAIT: Diagnostic Medical Sonography (DMS); Nuclear Medicine Technology (NMT); Medical Radiologic Technology (MRT)
- part-time and full-time faculty members were invited to participate as well as those with a focus in didactic and/or practicum courses

Nine interviews were completed. A minimum of two faculty members from each program participated in the interviews. This allowed a breadth of data to be collected from across the programs and ensured representation of the whole DI portfolio in the study.

Recruitment Strategy. Program specific faculty meetings were used to introduce prospective participants to the proposed study. A follow-up email was sent to all faculty members with a recruitment poster containing information on how they could participate and what was expected of them during the study (see Appendix C). I was not in a place of power in relation to the potential participants but rather is seen as having a horizontal collegial relationship thus alleviating any perceived coercion. During recruitment, potential participants were made aware of anonymity, confidentiality, and safe keeping of data.

Interview Procedure. Face to face interviews were scheduled. Seven interviews were completed in-person and two interviews were completed virtually using MS Teams. Informed consent was acquired (see Appendix D), and participants were informed that they would be

provided an opportunity to review the interview transcript prior to the analysis phase. During the review of the transcripts the participants could delete or strike any part of the interview that they did not feel comfortable having included in the study data. Making the participants aware of this option helped to create an environment of trust which allowed participants to speak freely and not worry about the inclusion of potentially sensitive answers during the interview (Rowlands, 2021).

Semi-structured interviews were conducted using an interview guide (see Appendix E). Both in-person and virtual interviews were audio recorded using a digital recording device. Interviews were scheduled for up to 60 minutes in length. All participants completed the interviews and the sessions ranged from 31 to 50 minutes in length. Participants were provided with a $50 gift card as a token of appreciation for the time they gave to this study. All nine interviews were transcribed using Otter AI software, and then reviewed for accuracy. Participants were then invited to review their interview transcript for accuracy. After transcript approval from the participants was achieved, the transcripts were de-identified in order to maintain participant anonymity and confidentiality.

Data Analysis

The Framework analysis approach was utilized for data analysis in this study. This is a practical approach to analysis and provides a way to manage multiple data sets, including interview transcripts and documents (Goldsmith, 2021). The overall objective of Framework analysis is to identify, describe, compare and contrast key patterns and themes within the phenomenon of interest (Goldsmith, 2021). This approach enables the researcher to remain focused on the propositions of the study design while ensuring a meaningful interpretation of the datasets. This aligns with Yin's analytical strategy in case study research whereby the initial

propositions help to shape data collection and analysis strategies (Yin, 2014). The five stages of Framework analysis are familiarisation, identifying a thematic framework, indexing, charting, mapping and interpretation. These stages are described below.

Familiarization. During familiarisation, an in-depth immersion in the raw data was completed. This was an iterative process where I read and re-read the transcripts to become acquainted with the content. Notes were made and documented in my reflective journal. I continued to review the transcripts multiple times and make initial connections of recurrent themes and links to propositions (Pope et al., 2000).

After each interview was completed, notes were made and a list of relevant documents mentioned in each session was maintained. During the initial document collection, a database was created with retrieval dates, and location of the document. The documents were then evaluated to determine credibility and accuracy. During ongoing review, the list grew to include relevant profession specific resources. Each document was first skimmed then read and reviewed in an iterative process, to prepare for inclusion during the interpretation stage (Bowen, 2009).

Identifying a thematic framework. In qualitative research, coding is used as a tool by researchers to break down data and then re-assemble the data in a meaningful way (Elliott, 2018). By coding the raw data the researcher can better identify how the data relates to the research question and correlate back to the propositions (Elliott, 2018). Coding of interview transcripts and the institutional documents allowed me to discover connections and map the data into categories. “The end product of this stage is a detailed index of the data, which labels the data into manageable chunks for subsequent retrieval and exploration” (Pope et al., 2000, p.116).

Indexing. Once the raw data has been appropriately coded, application of the thematic framework includes establishing codes through numerical annotations of applicable data sets

(Pope et al., 2000). During this stage, categories and subcategories were discovered in the data sets and allowed a systematic indexing of the complex data to be completed (Goldsmith, 2021). Themes were reviewed for consistency across the data sets and I continually re-evaluated the emerging themes to ensure quality.

Charting. The charting process involves a considerable amount of abstraction and synthesis and enables a summary of the indexed data (Goldsmith, 2021; Pope et al., 2000). With the formation of charts I categorized the indexed themes to align with propositions as well as enable the discovery of new themes. The charts contained distilled summaries of both data sets and enabled me to connect categories and subcategories to the themes**.**

Mapping and Interpreting. During the final stage of Framework analysis, comparison of potential areas of interest is completed by examining variations within the categories and subcategories while looking for clusters of data (Goldsmith, 2021). The charts from the previous phase enable mapping between themes to show links to findings which then allow for meaningful interpretations (Pope et al., 2000). Interpretations can demonstrate associations and relationships across the data sets in reference to the research question (Goldsmith, 2021).

Results

Following the Framework analysis approach of data analysis two categories were identified; Individual Attributes and Collective Influences. These first emerged during the review of interview transcripts and were explored further with triangulation of institutional documents. I was able to align propositions with the indexed codes from the data and see patterns across data sets. Additionally, sub-categories in each group revealed themselves throughout the continued process of data analysis.

Individual Attributes (IA1-4): Individual attributes are descriptions of qualities that are held by the person and can impact their ability to develop and delivery TGD content.

1. Career choice and educational background
2. Knowledge and comfort of curriculum and content change process at SAIT
3. Awareness of, and personal experiences with the TGD community
4. Inherent inquire mindset

Collective Influences (CI 1-3): The collective influences describe the impact that the environment (SAIT) has on the individual attributes.

1. Visibility of EDI strategies at SAIT
2. Onboarding at SAIT
3. Collaboration with industry partners

Individual Attributes

IA-1: Career choice and educational background. I began each interview by asking the participant why they had chosen medical imaging as a career. I was curious if there were similarities within the group regarding their career choice. There were some consistent themes between the participants. During the interviews many participants mentioned that they found biology and anatomy interesting and explained they had always felt they wanted a career in healthcare – but they did not want to be a doctor or nurse. Medical imaging was suitable for those that desired something with a technical focus, yet still had allowed for direct patient contact. Though the initial rationale for choosing medical imaging as a career may have had some similarities – the pathway was often unique. For seven of the nine interview participants, graduating from a medical imaging program was not their first post-secondary experience.

I also wanted to hear more about what made them switch from working on the floor as a medical imaging technologist to becoming an educator at SAIT. As with the previous question regarding career choice – there were commonalties. Many participants mentioned that they had enjoyed working with students in the clinical setting as a technologist, and often gravitated towards formal preceptor roles in industry. They reflected on their own time as a student, and remembered instructors that they had being positive role-models. Educators enter the classroom setting with various backgrounds – both professionally and personally. They have unique attributes, experiences, passions and comfort zones that are reflected in their teaching.

IA-2: Knowledge and comfort of curriculum and content change process at SAIT. I was especially curious about how instructors are informed about necessary changes to what needs to be included in program curriculum. Then I wanted to learn more about how these changes are actualized, whether that be in the classroom, labs or in practicum. I started the interview by gaining a better understanding of how the participants differentiated curriculum and content, as these terms are used often in the institutional setting. Participants described curriculum as the official learning objectives and outcomes of the course. Curriculum is housed in course outlines which is a type of contract between the students and SAIT. The instructors are responsible for ensuring the outcomes are included in the course material. Participants mentioned "accreditation standard, national competency profiles and legal binding contract" when explaining curriculum in their own words and used descriptors such as "rigid, oversight, onerous, approvals, processes, timelines and slow to change." Content was defined as "how I teach; learning material; instructor twist on curriculum." Adjectives such as "fluid, easy to change, flexible, and adaptable" were used when referencing course content. The term "legacy content" was often brought up, and this was defined as content from previous course deliveries that was

passed down to an instructor. Some participants relied heavily on legacy content for the first delivery of a course offering, but others felt more comfortable creating their own content.

When reviewing SAIT documents there are policies and procedures pertaining to curriculum review and course outlines, which provide some guidance to instructors regarding the process. Some instructors mentioned that they gained experience with these processes as part of program redesigns – but not all participants had been part of that process. Participants mentioned that curriculum changes were supported when necessary but they often felt making content changes could be done with little oversight and as required for course improvement. Overall, the participants understood the importance of curriculum and why the lengthier process to change was required.

IA-3: Awareness of, and personal experiences with the TGD community. Many participants had personal experiences with TGD populations or self-identified as knowing the basics about the community. Participants mentioned that concepts such as use of pronouns, gender neutral washrooms, and inclusive space signage were more visible in public spaces such as bookstores, coffee shops, and restaurants. Participants that had personal relationships with a TGD community member were empathetic of the experiences during encounters with the healthcare system.

Participants also sensed a change in the student body on campus. More students openly identify as being part of the 2SLGBTQ+ community and many participants noted they had students in their classrooms that belonged to the community. The participants reflected on ways that they had begun making their classrooms safer and more inclusive spaces. One participant mentioned asking students to provide preferred names and pronouns during introductions as a way to open the door and lines of communication to any student that may need it.

IA-4: Inherent inquire mindset. A growth mindset describes the desire for continuous learning and professional growth which stood out as an attribute of participants as an inherent inquire mindset. This mindset was one reason for their switch from being a practicing technologist in industry to becoming a faculty member at an educational institution. This desire was evident by statements such as; "I always have desire to learn new things; I need to learn the content more in depth before teaching it in the classroom; I am a lifelong learner, I want to know more about learning theories; when there is a lack of current resources I do further digging to learn more." There was a clear theme that the desire and need for continuous learning was seen as a benefit to the role of being an educator. Many of the participants expressed the need for continuing their professional growth was well suited to work in an educational institution with structure and processes.

Visibility of the inquire mindset theme was also supported in several of the institutional documents. Within the strategic plan there is mention of Commitment to Excellence where recognition and support of employee excellence is highlighted by way of "hire for a growth mindset curiosity and collaboration" (SAIT Strategic Plan, 2022 p.4). The recent job posting within in the DI portfolio also referenced inquire mindset as an attribute for the position "Demonstrates a positive and respectful attitude and has a growth mindset; Committed to quality and engages in continuous improvement; Reflective about personal and professional growth" (SAIT job posting, 2022, p.4).

Collective Influences

CI-1: Visibility of EDI strategies at SAIT. Many participants could provide concrete examples of how Equity, Diversity and Inclusion (EDI) initiatives where seen on SAIT campus. They felt there was an increased visibility of EDI initiatives and attempts were being made to

make SAIT campus a more inclusive space for students and faculty. Across the data sets I was able to find several examples of how SAIT leadership and the SAIT community are prioritizing EDI initiatives.

Table 1

EDI Initiatives on SAIT Campus

Area	Interviews	Documents
SAIT leadership	• encouragement to celebrate on campus • very much a SAIT goal • diversity moments at meetings • pronouns on SAIT e-mail signatures	*SAIT Strategic Plan* • develop and implement a diversity and inclusion strategy to build a supportive community for all students and employees *SAIT Annual Report 2020/21* • mention the release of the EDI strategic plan in February 2021 • support strategies including training and seminars • Pride at SAIT committee events during Pride Week
EDI office	• Awareness that there is an EDI office • Mention as a potential resource for faculty	*EDI Strategic Plan 2020-2025* was released by EDI office in Feb 2021. Describes how SAIT will move forward towards being a more inclusive organization. Outcomes: • Staff, faculty and students have the confidence to practice and promote EDI inside and outside of the classroom. • Curriculum better reflects the diversity of the SAIT campus.
SAIT communications	• Source to find courses, initiatives • Have seen Pride events posted • Rainbow crosswalk on Campus	SAIT updates are emailed weekly as SAITnow Employee Bulletin to all SAIT employees and can also be found on SAIT.ca
SAIT social media platforms	• Follow SAIT social media • An increase in pride posts has been noticed	Instagram, Facebook profile pictures changed to Rainbow logo during Pride month
SAIT Employee Services		EDI statement reflected in job recent job posting

SAIT EDI website	• PERS 148 course	Public facing website with many resources around EDI strategies • Training registration • Understanding pronouns • Inclusion talks • Pride @ SAIT information • Campus map with inclusion of universal washroom
School of HPS/DI portfolio	• Preceptor Education Day keynote speaker • Stakeholder meeting with partners and faculty	EDI statement on webpage

CI-2: Onboarding at SAIT. Each participant reflected on their transition from working in industry to becoming an instructor at SAIT. There was mention of the huge transition and varying supports in place as a new faculty member. Participants mentioned numerous supports that were provided by the institution including a formal buddy system, mandatory training programs, and formal courses to help learn more about teaching in a classroom. Some participants had informal mentors as well that they relied on to help them adjust to the new role. Despite the mention of the formal onboarding process, the reality was that there were challenges with the execution in some the programs. The biggest factor was the timing between the hiring date and consequently the start date of teaching in the classroom for the first time. For some, this was a very short time frame, and there was not enough time to go through the full onboarding schedule and courses ahead of time.

Despite the challenges associated with the transition from technologist to faculty member, the participants have continued their journey as a SAIT instructor. They have adapted to teaching new courses, classroom management skills, and they have learned about academic policies and procedures. Many have transitioned between the different roles within the programs working not only in the classroom setting but also in the SAIT labs and as practicum instructors.

CI-3: Collaboration with industry partners. All three programs within the DI Portfolio at SAIT are accredited by Accreditation Canada. The programs also work closely with the Diagnostic Imaging Advisory Committee to ensure that the curriculum continues to meet or exceed provincial and national accreditation standards. The national competency profiles (NCPs) defines the key learning outcomes that should be the product of accredited education programs. NCPs are managed by professional bodies and in the case of the SAIT medical imaging the NCPs are housed with the Canadian Association of Medical Radiation Technologists (CAMRT) and Sonography Canada. The profiles are intended to set a national standard for each MRT discipline and provide an overview of competencies that is used as a guide for post-secondary institutions to use during curriculum development (Canadian Association of Medical Radiation Technologists, 2020)

During the interviews, the relationship of how changes in industry standards influence program outcomes was also discussed. NCPs are updated based on changes and needs seen in industry and are reviewed a regular basis. NCPs are intentionally left non-prescriptive to ensure that they can be implemented on a national level. NCPs are minimum standards – which means that educational programs can chose to include outcomes above and beyond what is in the NCPs. As NCPs are re-validated and updated approximately every five years to reflect changes in the profession it is imperative that continuous collaboration with program partners is an ongoing part of annual content and curriculum review.

Revision of the Research Question

Case study research involves ongoing examination and interpretation of the data in order to reach tentative conclusions and to refine the research questions (Hancock & Algozzine, 2016). Case study research adheres to several guidelines in which there is simultaneous summarization

and interpretation of information. When reviewing the data there is a constant focus on the research question and propositions. This maintains focus on what data is important and ensure that the analyzed data remains within the scope of the research question (Baxter & Jack, 2008). A Framework approach was applied for data analysis and enhanced interpretation of the results. Ongoing refinement of the study's fundamental research question is undertaken in light of data obtained early in the investigation (Hancock & Algozzine, 2016). After careful review of the initial results from the data analysis, the research question was refined to better reflect the data and interpretation as follows:

How do individual attributes and collective influences impact educators when they are creating and delivering TGD content into medical imaging programs?

Themes

With in-depth analysis of the categories and completion of the charting phase of the framework, seven themes were identified: familiarity and comfort with curriculum and content change process; collaboration with other healthcare programs; teaching expertise; management of course workload and related duties; connections to the transgender and gender diverse community; knowledge of required transgender and gender diverse content and existing gaps in curriculum; access to supports.

The seven themes that were identified through the data analysis relate to the influences that impacted educators when they are creating and delivering TGD content. I was able to connect individual attributes and collective influences that were identified in the results section with each theme (See Table 2). This triangulation of the data allowed me to find a connection between the barriers and the characteristics which provide the foundation of the discussion. This was an iterative process where I continuously went back into the data sets and refined the themes

and categories, allowing me to gain more understanding of the impact that the influences had on the educators, and how the influences were seen from both the individual and collective categories. This process aligns with Yin (2014) use of chain of evidence case study whereby the researcher can show how the findings come from the data, case study design and research questions.

Table 2

Individual Attributes and Collective Influences Relations to Themes

Themes	Individual Attributes	Collective Influences
Familiarity and comfort with curriculum and content change process	• Knowledge and comfort of curriculum and content change process at SAIT (IA-2)	• Onboarding at SAIT (CI-2)
Collaboration with other healthcare programs	• Inherent inquire mindset (IA-4)	• Visibility of EDI strategies at SAIT (CI-1) • Onboarding at SAIT (CI-2)
Teaching expertise	• Career choice and educational background (IA-1) • Knowledge and comfort of curriculum and content change process at SAIT (IA-2)	• Onboarding at SAIT (CI-1)
Connections to the transgender and gender diverse community	• Awareness of, and personal experiences with the TGD community (IA-3) • Inherent inquire mindset (IA-4)	• Visibility of EDI strategies at SAIT (CI-1) • Collaboration with industry partners (CI-3)
Knowledge of required transgender and gender diverse content and existing gaps in curriculum	• Career choice and educational background (IA-1) • Knowledge and comfort of curriculum and content change process at SAIT (IA-2) • Awareness of, and personal experiences with the TGD community (IA-3) • Inherent inquire mindset (IA-4)	• Visibility of EDI strategies at SAIT (CI-1) • Collaboration with industry partners (CI-3)
Access to supports	• Inherent inquire mindset (IA-4)	• Visibility of EDI strategies at SAIT (CI-1) • Onboarding at SAIT (CI-2)
Management of course workload and related duties	• Knowledge and comfort of curriculum and content change process at SAIT (IA-2) • Inherent inquire mindset (IA-4)	• Onboarding at SAIT (CI-2)

Familiarity and Comfort of Curriculum and Content Change Processes (IA-2 and CI-2)

Individually, participants mentioned varying levels of knowledge and comfort with the curriculum change process at the institution. Many described that they aligned the content directly with the formal course outline. Those that had taken part in a formal program re-design had a better understanding of how to complete changes. From the institutional perspective, documents revealed that there is a formal policy and procedure in place, and an annual review of curriculum is expected to be completed by leadership and faculty. The process for changing curriculum can be onerous and follows a rigorous cycle with a strict timeline. The instructors vocalized that more guidance around the process could be helpful when discussing the ability to add TGD related content. "*At times, when I would ask for guidance, or help with certain things [changing content], I felt like I maybe didn't get as much support as I would have liked."* (Participant #2)

Collaboration with other Healthcare Programs (IA-4, CI-1 and CI-2)

Participants had little knowledge of what initiatives in TGD content were being implemented outside of their own course, program, or portfolio. There was reference to subject matter experts from within the institution but they were not specifically used within course content development. Participants alluded to the possibility of having the institution support the creation of a core course within the healthcare programs as many patient centered competencies for the TGD community were transferable among healthcare providers. Having a core course would ensure experts could collaborate together to help create and facilitate common competencies and ensure the terminology and messaging was consistent across the programs. *"I wonder if there is a way to go to an expert, and then continue the conversation in our courses."* (Participant #8).

Teaching Expertise (IA-1, IA-2 and CI-2)

SAIT instructors are hired as subject matter experts in their profession to teach students, and many do not possess any formal type of teaching background. This is evident in the qualifications that are listed on job postings for diagnostic imaging faculty. A recent job posting included the following required qualifications:

"Must have current CAMRT certification and be a registered Medical Radiation Technologist, Nuclear Medicine specialty with the Alberta College of Medical Diagnostic and Therapeutic Technologists (ACMDTT), or eligible for registration, a member of the national professional association, minimum of three years clinical experience, previous teaching experience in adult education an asset" (SAIT job posting, 2022, p.3).

During the SAIT onboarding process, new hires complete a variety of in-house facilitated instructor training programs to prepare them for classroom delivery. Courses focus on teaching strategies and delivery of content, *"The course through SAIT, which deals with lecture creation, content creation as well as grading and feedback"* (Participant # 4). The experiences from these courses varied greatly between the participants. Some participants had challenges attending some of the offerings due to scheduling. There were also a few participants who started teaching a very short time after being hired and were only able to complete the courses after already teaching in the classroom.

When instructors were given new courses to teach, they relied heavily on legacy content and much of their time was spent learning the material in a way that they felt comfortable teaching it in the classroom. The lack of TGD legacy content made it very challenging for faculty members to include TGD outcomes.

Connections to the Transgender and Gender Diverse Community (IA-3, IA-4, CI-1 and CI-3)

All participants were able to define transgender and gender diversity in their own words – but often felt unsure that they were using the correct terminology and questioned their own knowledge around the terms. As individual participants, there was a range with their sense of connectedness to the TGD community; some mentioned having family members, relatives or friends who identify as part of the TGD community, others felt there was an increase in their awareness based on social media influences and mainstream media. Many participants were open in sharing some of the experiences that they have encountered and how those influenced their current practice inside and outside of the classroom. *"I feel free to add it [inclusive teaching practices] because it matters to me, but there has not been a very strong push [from leadership] that you have to add it"* (Participant #4)

There was an expressed interest to learn more about the TGD community and how, as cis-normative faculty members, they could better support and reflect the needs of the TGD community authentically in their courses. During the interviews, participants recognized that an authentic connection to the community was a key factor in learning about the community and their needs in the healthcare setting. *"You can do a lot of work as an ally, but there is nothing like the experience of a person who is living it*" (Participant #4)

Knowledge of Required TGD Content and Gaps in Existing Curriculum (IA-1, IA-2, IA-3, IA-4, CI-1 and CI-3)

During the interviews, there were challenges in defining TGD content. What does it specifically refer to in a medical imaging context? Does it only relate specifically to expertise required in the profession and to treat patients? There was an overwhelming sense that the programs did not currently include specific TGD content. Participants identified courses where

they felt that TGD content could be placed very naturally. Common across the programs was the mention of having the focus of TGD populations in patient care courses as these types of courses already had an outcome relating to other equity seeking groups. Adding TGD topics in professional practice was also suggested as a natural placement by many of the participants.

All programs work very closely with industry stakeholders to ensure that students are well prepared to enter the workforce. Participants want to align program standards with what is being done in industry – but there was minimal direction and resources given by partners on TGD content. Some participants mentioned that they were interested in incorporating TGD content into their courses despite the lack of prompting from industry as they themselves knew it was an important topic in healthcare. This deviated somewhat from the standard that is often seen in programs where incorporating changes to content mimics changes in industry (as seen with technology advancements, protocols, etc). There were concerns expressed that if students were taught new standards in the program that they might experience some pushback from industry when entering practicum.

It was also evident that TGD content could be seen in a multifaceted way. Topics were identified as being healthcare related and specific to medical imaging. There was also expression of interest to create more inclusive classrooms, to better reflect the diversity of the student population. Some examples of inclusive classroom practice and TGD specific content can be found in Table 3.

Table 3

Topics Related to TGD Inclusive Classroom and Content

Inclusive classroom practices	**TGD specific content**
Limiting the use of he/she in class material	Inquiring about last menstrual cycles/pregnancy status
Limiting the use of "guys" when addressing the class	Inquiring about breastfeeding status
Increase awareness around language	Scanning OB simulators
Using pronouns when introducing yourself to the class	Female versus male comparisons for pelvic imaging
Use of gender-neutral names in class material	Patient care – increase awareness about TGD as a marginalized community in the healthcare setting
Adding pronouns to email signature	Shielding practices

Access to Supports (IA-4, CI-1 and CI-2)

Several participants expressed a desire for access to additional resources and supports with TGD content in the classroom, *"You can read and you can read and your can read. It would be nice with a facilitated workshop"* (Participant #7). Many participants mentioned that they had some access to resources to increase their own knowledge about general EDI topics, but limited access to specific resources dedicated to the TGD community. These supports were often through professional bodies and open-education resources through other post-secondary institutions.

There were questions about accuracy of resources, especially in light of the changing terminology. What are considered official/validated resources? Instructors did not feel that they had enough knowledge and expertise to teach this topic in the classroom. There was fear of saying something wrong and unintentionally offending people. The EDI strategic plan at SAIT included assurances that instructors were given resources to update curriculum. During the interviews many participants were unaware of any supports currently in place within the

institution that could help them in their desire to create more TGD content and inclusive classrooms. *"That is why we are in the healthcare field is to make patients feel better in a really difficult time in their lives and you can't really accomplish that task if you are ignorant"* (Participant #10).

Management of Course Workload and Related Duties (IA-2, IA-4 and CI-2)

Participants often mentioned that the biggest barrier to developing and creating new content of any kind was lack of time, *"We are developing on the fly as we are teaching"* (Participant #3). It was evident faculty felt they were stretched thin and that completing major course updates while managing other work-related duties was a challenge. When instructors were given new courses to teach they often mentioned that they spent a large amount of time learning the material prior to course start. Participants mentioned that they understood the importance of adding TGD content into the program, but with additional demands of assignable duties and maintaining a work/life balance many did not feel they had the time required to adequately create new content.

Discussion

The themes discussed in this study are not necessarily considered positive or negative in nature. The described impacts on faculty can be seen as benefitting the educators' abilities to develop and deliver the TGD content and/or hindering the creation of the content. There is an interconnectedness and interdependency of the themes. They are not separate from one another and do not exist individually as separate entities. That is to say that this is a complex issue and the identified themes should not be considered a list that can be resolved one by one.

Transgender and gender diverse communities represent only one of several equity seeking groups in healthcare. Research with a focus on TGD content in health care curriculum is

a novel topic of study. There are relevant studies related to strategies to increased incorporation of other EDI curriculum and content in a variety of health profession such as nursing, medicine, dentistry, pharmacy, and social work (Charania & Patel, 2022; Doria et al., 2021; Muntinga et al., 2016; Naidoo & van Wyk, 2020; Virdun et al., 2013). Drawing parallels from these studies to the findings from this study can provide further insight for institutional curriculum reforms relating to TGD content. This study identified various combinations of individual attributes and collective influences that came together to influence TGD content and curriculum development. These combinations resulted in themes which could be linked to specific roles associated with both the institutional supports and the faculty members. This echoes results from other studies, such as the use of multi-level institutional strategies to engage faculty in the implementation of EDI curriculum in nursing courses (Charania & Patel, 2022) as well as a model described by Holthouser et al.(2017, p. 372) that aimed to "incorporate content throughout required medical curriculum, foster community participation, and engage the healthcare community through multiple parallel initiatives, such as faculty development and institutional climate change."

The Role of the Institution

The significance of institutional support should not be down-played, as without leadership support many initiatives and diversity projects would not be possible (Charania & Patel, 2022; Virdun et al., 2013). One study mentioned a perceived ambivalence from leadership or a lack of institution oversight to include diversity topics, as impeding to faculty members' abilities to effect change (Doria et al., 2021). Ensuring that all faculty members are provided with resources and training to increase their confidence in these topics is imperative as studies show that many faculty members reported feeling unprepared and worried about using incorrect terminology with students (Doria et al., 2021; Virdun et al., 2013). Institutionally led initiatives

including policies and plans are imperative to provide the necessary aide faculty members require to create content (Charania & Patel, 2022). In this study, participants mentioned that there were visible EDI strategies on campus, and they felt that EDI was a topic that was supported by leadership. It is important to prioritize accessibility of resources by providing support for faculty to attend education sessions.

The role the of the institution regarding the curriculum review process is also of significance. The NCPs are currently used as framework for curricula in the accredited programs and institutional support is required to provide faculty members with training and knowledge to ensure curriculum remains aligned with the NCPs to maintain accreditation. Naidoo and van Wyk (2020) proposed that a national standardized curriculum could be seen to improve the inclusion of geriatric content into medical undergraduate programs in South Africa. Developing a national standardized curriculum for medical imaging programs would challenging as there are a variety of program lengths and disciplines across Canada. This includes post-secondary institutions with diploma length programs starting at 22 months up to degree programs of years. All accredited post-secondary programs adhere to the competency profile published by the CAMRT and continued institutional collaboration with educational partners and stakeholders is necessary to inform updates to curriculum. This ongoing collaboration will ensure that competencies relating to cultural sensitivity and diversity are included in future updates to the NCPs.

Collaboration and inclusion of community members is another key responsibility of the institution. Supporting activities that engage patient partners, other healthcare providers, and various community members will provide opportunities for knowledge sharing and building understanding between different stakeholders. In one study, a university hosted a community

forum where 59 participants from across campus and within the community came together to discuss the needs of transgender healthcare and initiate conversations to find themes that could inform future curriculum gaps in the program (Noonan et al., 2018). This type of project would not be possible without the deliberate and sustained support from across the institution.

A robust institutional strategy can ensure that TGD content is integrated across all program courses as part of the instructional design and consistent language is continuously woven throughout course outlines. It is evident that instructors rely heavily on the course outlines when updating their course content and terminology from the outlines can be replicated in the course content.

The Role of Faculty

A significant barrier to incorporating any type of EDI content into healthcare curricula is the faculty members' perceived lack of knowledge and expertise on the topics. This barrier has been highlighted with curriculum development of specific equity seeking groups such as those advocating for Indigenous content (Doria et al., 2021; Virdun et al., 2013), and also broader diversity topics such as increased integration of race and culturally diverse topics (Charania & Patel, 2022; Muntinga et al., 2016). If there is only a single faculty member that has the skill and knowledge they are left isolated and carry a large burden of responsibility similar to that seen in Indigenous faculty members solely teaching Indigenous content (Doria et al., 2021).

Pololi and Evans (2015) showed that faculty group mentoring programs at a medical school resulted in participants experiencing an enhanced, inclusive, and appreciative culture, as well as enhanced appreciation for collaboration. Group mentoring programs were shown to be successful as they "facilitate meaningful relationships among peers and foster an appreciation for diversity, and focus on aligning personal values and professional choice" (Pololi & Evans, 2015,

p. 198). Faculty members in this study mentioned the fact that they often did not feel they had time to participate in additional types of training or faculty development programs.

As many of the healthcare competencies related to TGD individuals are not specific to medical imaging, there is a benefit in having faculty members participate in interprofessional educational opportunities. Collaboration between healthcare programs provides opportunity to share resources and expertise and is a means for a single program to achieve more than it would be able to on its own (World Health Organization, 1988). Multiprofessional education is a well-established tool used in healthcare education where different health professions learn and collaborate together in providing promotive and preventive health-related skills (World Health Organization, 1988). Encouraging collaboration across the healthcare programs in areas of patient care, professionalism and inclusive environments would provide students with not only the required increased competency of working with TGD and other equity seeking communities, but this collaboration would provide the students and faculty with awareness of other healthcare roles.

The sense of connectedness with the TGD community stands out as a factor that has a significant impact on the ability of faculty to feel knowledgeable and comfortable to incorporate TGD content. Inviting members of equity seeking groups to work with post-secondary institutions is considered best-practice and can lead to increased awareness and enhanced collaboration on curriculum development projects (Noonan et al., 2018). In this study, it was evident that the faculty members that had a personal connection to the TGD community took initiatives to implement small changes in their teaching practices. Engaging with community members either in the form of formal conversations, mentoring programs or simulation scenarios can lead to faculty members gaining an improved sense of connectedness to the

community and can expand their knowledge and comfort level (Muckler et al., 2019; Noonan et al., 2018; Pololi & Evans, 2015).

Circling back to the propositions from the onset of this study is important as they have been reflected throughout the research process including the discussion. Of the four initial propositions, only one was not made evident in the results: Educators do not see the value/need of including the TGD content. In this study, there was an overwhelming consensus from the participants that the incorporation of TGD content was needed in their programs. Participants noted that inclusion of TGD content would not only provide students with the required competencies needed to provide inclusive healthcare in practice, but it would also facilitate inclusive spaces and overall improvement of basic knowledge to improve societal understanding and compassion of the TGD community.

Study Limitations

This study is part of a requirement for the completion of a Master's degree and a single researcher was completing the data analysis and discussion. This challenge was mitigated with the use of check-ins with the study supervisor as a way to help guide the analysis and discussions as required. I maintained a journal to establish self-reflective practice throughout all stages of the study. In case study research, there are benefits to additional use of member checking strategies, including allowing interview participants an opportunity to review the researcher's interpretations of the data and provide participants with opportunities to discuss, clarify, contribute additional perspectives (Baxter & Jack, 2008). This type of member checking was not feasible in the scope of a Master's level thesis project.

Future Implications

This study highlights the medical imaging educator's perspective of the influences that currently preclude the development of TGD curriculum development. This understanding can lead to an increased sense of empowerment for educators to create TGD curriculum and content in their courses for future deliveries. Many post-secondary institutions are incorporating an inclusive lens to their strategic plans; this research can be used as a resource for future curriculum design projects. Ensuring that the curriculum is updated will not only help meet accreditation requirements with current national competency profiles but may promote an inclusive learning environment for students. Including this curriculum in medical imaging programs will better prepare graduates in creating an inclusive and safer space for TGD patients in medical imaging settings. From an educational perspective, this study can serve as a guide for increasing awareness of and overcoming factors that currently impact faculty members in creating and delivering TGD content in medical imaging programs. Further commitment and support from leadership will ensure that faculty members feel supported with the increase of TGD content in their courses.

This study also highlights the need for further research in this area. Many of the influences that impacted faculty in this study can be linked directly to SAIT. This includes the onboarding process, policies and procedures as well as institutional strategic plans. To gain a better understanding of barriers at other institutions similar case studies could be completed at other post-secondary intuitions. Completion of a multi-case study could also be warranted to compare results from medical imaging programs nationally.

Conclusion

This research study provided a picture of how faculty members of SAIT's DI portfolio were impacted by certain barriers when developing and delivering TGD content. This case study was completed with the goal of learning more about what impacts an educator is faced with when creating and delivering TGD content in the courses they teach. The focus in this study is specific to TGD content. I wanted to know more about how the instructors are informed about the necessary changes to program curriculum. Then I wanted to learn more about how these changes are incorporated into the content across settings such as classrooms, labs, or in practicum. It was interesting to learn that many of the participants had challenges with defining or giving examples of what TGD content could look like in their program – despite recognizing that there currently is a lack of this content and the additional need for inclusion of TGD content.

Collective institutional supports are key factors for enabling educators to create and deliver the content. These supports begin during the onboarding phase of new faculty, and should include information about curriculum development process, EDI strategies, and additional learning opportunities where faculty members can increase their knowledge and connections with the community.

Faculty members have unique attributes, but despite their uniqueness, commonalities amongst the faculty group must be acknowledged. Their choice to enter a healthcare career and an inherent inquire mindset as educators have a direct impact on their desire to include TGD content. There is awareness that increased TGD content in programs will help ensure graduates possess the skills that are required to support the marginalized TGD community when accessing healthcare and enable the creation of safer and more inclusive medical imaging departments. Though appropriate and sustained leadership support can be seen as a catalyst for change –the execution and work must come from the entire faculty. A holistic approach where all levels of

the institution work together is required to overcome the barriers that currently preclude incorporation of TGD curriculum.

References

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, *13*(4), 544–559. https://doi.org/10.46743/2160-3715/2008.1573

Bolderston, A., Middleton, J., Palmaria, C., Cauti, S., & Fawcett, S. (2021). Improving Lesbian, Gay, Bisexual, Transgender, Queer and Two-Spirit content in a radiation therapy undergraduate curriculum. *Journal of Medical Imaging and Radiation Sciences*, Advance online publication. https://doi.org/10.1016/j.jmir.2021.01.001

Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Canadian Association of Medical Radiation Technologists. (2020). *National Competency Profile for Entry-Level Medical Radiation Technologists*. https://www.camrt.ca/wp-content/uploads/2020/03/RTR-Companion-2019_FINAL.pdf

Caruana, S. (2015). *Ethical Considerations when Carrying Out Research in One's Own Academic Institution*. *10*, 11.

Charania, N. A. M. A., & Patel, R. (2022). Diversity, equity, and inclusion in nursing education: Strategies and processes to support inclusive teaching. *Journal of Professional Nursing*, *42*, 67–72. https://doi.org/10.1016/j.profnurs.2022.05.013

Clark, K. R., & Vealé, B. L. (2018). Assessing transgender-related content in radiography programs in the United States: A survey of educators. *Journal of Medical Imaging and Radiation Sciences*, *49*(4), 414–419. https://doi.org/10.1016/j.jmir.2018.06.050

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry & research design. Choosing among five approaches* (4th ed.). Sage Publications.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). The case study approach. *BMC Medical Research Methodology*, *11*(1). https://doi.org/10.1186/1471-2288-11-100

Custer, T., Sayles, H., & Michael, K. (2020). Assessing the educational climate: Transgender content in medical imaging curricula. *Journal of Diagnostic Medical Sonography*, *36*(6), 536–543. https://doi.org/10.1177/8756479320944930

Dickey, L. M. (2017). Toward developing clinical competence: Improving health care of gender diverse people. *American Journal of Public Health*, *107*(2), 222–223. https://doi.org/10.2105/AJPH.2016.303581

Doria, N., Biderman, M., Sinno, J., Boudreau, J., Mackley, M. P., & Bombay, A. (2021). Barriers to Including Indigenous Content in Canadian Health Professions Curricula. *Canadian Journal of Education*, *44*(3), 648.

Dubin, S. N., Nolan, I. T., Streed, C. G., Greene, R. E., Radix, A. E., & Morrison, S. D. (2018). Transgender health care: Improving medical students' and residents' training and awareness. *Advances in Medical Education and Practice*, *9*, 377–391. https://doi.org/10.2147/AMEP.S147183

Dwyer, S. C., & Buckle, J. L. (2009). The Space Between: On Being an Insider-Outsider in Qualitative Research. *International Journal of Qualitative Methods*, *8*(1), 54–63. https://doi.org/10.1177/160940690900800105

Ebneyamini, S., & Sadeghi Moghadam, M. R. (2018). Toward developing a framework for conducting case study research. *International Journal of Qualitative Methods*, *17*(1), 1609406918817954. https://doi.org/10.1177/1609406918817954

Elliott, V. (2018). Thinking about the coding process in qualitative data analysis. *The Qualitative Report*. https://doi.org/10.46743/2160-3715/2018.3560

Floyd, M. J., Martin, O., & Eckloff, K. J. (2020). A qualitative study of transgender individuals' experiences of healthcare including radiology. *Radiography*, *26*(2), e38–e44. https://doi.org/10.1016/j.radi.2019.10.008

Gerring, J. (2004). What is a case study and what is it good for? *The American Political Science Review*, *98*(2), 341–354. https://www.jstor.org/stable/4145316

Goldsmith, L. (2021). Using Framework Analysis in Applied Qualitative Research. *The Qualitative Report*. https://doi.org/10.46743/2160-3715/2021.5011

Grimstad, F. W., Stowell, J. T., & Gaddis, M. (2020). Survey of experiences of transgender and gender nonbinary patients during imaging encounters and opportunities for improvement. *American Journal of Roentgenology*, *215*(5), 1136–1142. https://doi.org/10.2214/AJR.19.22558

Hancock, D. R., & Algozzine, B. (2016). *Doing Case Study Research: A Practical Guide for Beginning Researchers*. Teachers College Press.

Harrison, H., Birks, M., Franklin, R., & Mills, J. (2017). Case study research: Foundations and methodological orientations. *Forum: Qualitative Social Research*, *18*(1), Article 1. https://doi.org/10.17169/fqs-18.1.2655

Holthouser, A., Sawning, S., Leslie, K. F., Faye Jones, V., Steinbock, S., Noonan, E. J., Martin, L. J., Weingartner, L. A., Potter, J., Davis, J., Eckstrand, K. L., & Ann Shaw, M. (2017). eQuality: A process model to develop an integrated, comprehensive medical education curriculum for LGBT, gender nonconforming, and DSD health. *Medical Science Educator*, *27*(2), 371–383. https://doi.org/10.1007/s40670-017-0393-5

Korpaisarn, S., & Safer, J. D. (2018). Gaps in transgender medical education among healthcare providers: A major barrier to care for transgender persons. *Reviews in Endocrine and Metabolic Disorders*, *19*(3), Article 3. https://doi.org/10.1007/s11154-018-9452-5

Lim, F., Johnson, M., & Eliason, M. (2015). A national survey of faculty knowledge, experience, and readiness for teaching Lesbian, Gay, Bisexual, and Transgender health in baccalaureate nursing programs. *Nursing Education Perspectives (National League for Nursing)*, *36*(3), 144–152. https://doi.org/10.5480/14-1355

McPhail, D., Rountree-James, M., & Whetter, I. (2016b). Addressing gaps in physician knowledge regarding transgender health and healthcare through medical education. *Canadian Medical Education Journal*, *7*(2), e70-78. https://doi.org/10.36834/cmej.36785

Mohammed, S. (Director). (2018, May). *Case study: What makes a case?* Centre for Critical Qualitative Health Research. https://www.youtube.com/watch?v=V7XTVBajjr8

Muckler, V. C., Leonard, R., & Cicero, E. C. (2019). Transgender Simulation Scenario Pilot Project. *Clinical Simulation in Nursing*, *26*, 44–48. https://doi.org/10.1016/j.ecns.2018.10.007

Muntinga, M. E., Krajenbrink, V. Q. E., Peerdeman, S. M., Croiset, G., & Verdonk, P. (2016). Toward diversity-responsive medical education: Taking an intersectionality-based approach to a curriculum evaluation. *Advances in Health Sciences Education*, *21*(3), 541–559. https://doi.org/10.1007/s10459-015-9650-9

Naidoo, K., & van Wyk, J. (2020). Preparing medical graduates to care for geriatric patients: A case study of the undergraduate medical curriculum at a South African university. *South African Family Practice*, *62*(1). https://doi.org/10.4102/safp.v62i1.5081

Noonan, E. J., Sawning, S., Combs, R., Weingartner, L. A., Martin, L. J., Jones, V. F., & Holthouser, A. (2018). Engaging the transgender community to improve medical education and prioritize healthcare initiatives. *Teaching and Learning in Medicine*, *30*(2), 119–132. https://doi.org/10.1080/10401334.2017.1365718

Pearson, M. L., Albon, S. P., & Hubball, H. (2015). Case study methodology: Flexibility, rigour, and ethical considerations for the scholarship of teaching and learning. *The Canadian Journal for the Scholarship of Teaching and Learning*, *6*(3). https://doi.org/10.5206/cjsotl-rcacea.2015.3.12

Pedersen, S., & Corcoran, L. (2021). Implementation of transgender and gender diverse curriculum in medical imaging programs: A review of the literature. *Journal of Medical Imaging and Radiation Sciences*, *52*(4), S110–S116. https://doi.org/10.1016/j.jmir.2021.06.005

Pololi, L. H., & Evans, A. T. (2015). Group Peer Mentoring: An Answer to the Faculty Mentoring Problem? A Successful Program at a Large Academic Department of Medicine. *Journal of Continuing Education in the Health Professions*, *35*(3), 192–200. https://doi.org/10.1002/chp.21296

Pope, C., Ziebland, S., & Mays, N. (2000). Qualitative research in health care: Analysing qualitative data. *BMJ*, *320*(7227), 114–116. https://doi.org/10.1136/bmj.320.7227.114

Rowlands, J. (2021). Interviewee Transcript Review as a Tool to Improve Data Quality and Participant Confidence in Sensitive Research. *International Journal of Qualitative Methods, 20.* https://doi.org/10.1177/16094069211066170

Stowell, J. T. (2019). Serving the needs of transgender and gender-diverse persons in radiology. *Journal of the American College of Radiology*, *16*(4), 533–535. https://doi.org/10.1016/j.jacr.2018.12.050

Stroumsa, D., Shires, D. A., Richardson, C. R., Jaffee, K. D., & Woodford, M. R. (2019). Transphobia rather than education predicts provider knowledge of transgender health care. *Medical Education*, *53*(4), 398–407. https://doi.org/10.1111/medu.13796

Swanborn, P. (2018). What is a case study? In *Case study research: What, why and how?* Sage Publications. https://doi.org/10.4135/9781526485168

The Trans PULSE Canada Team. (2020). *QuickStat #2 – Primary care and unmet health care needs*. https://transpulsecanada.ca/research-type/quickstats/

Tufford, L., & Newman, P. (2012). Bracketing in Qualitative Research. *Qualitative Social Work*, *11*(1), 80–96. https://doi.org/10.1177/1473325010368316

Virdun, C., Gray, J., Sherwood, J., Power, T., Phillips, A., Parker, N., & Jackson, D. (2013). Working together to make Indigenous health care curricula everybody's business: A graduate attribute teaching innovation report. *Contemporary Nurse*, *46*(1), 97–104. https://doi.org/10.5172/conu.2013.46.1.97

Winter, S., Diamond, M., Green, J., Karasic, D., Reed, T., Whittle, S., & Wylie, K. (2016). Transgender people: Health at the margins of society. *The Lancet*, *388*(10042), 390–400. https://doi.org/10.1016/S0140-6736(16)00683-8

World Health Organization. (1988). Learning together to work together for health: Report of a WHO Study Group on Multiprofessional Education of Health Personnel: The Team Approach [meeting held in Geneva from 12 to 16 October 1987]. *Geneva*. https://apps.who.int/iris/handle/10665/37411

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Sage Publications.

Table 4

Document Review

SAIT Documents	
EDI Strategic plan	Equity, Diversity and inclusion (EDI) strategic plan
SAIT Strategic plan	New World, New Thinking 2020 - 2025
SAIT Annual report 20/21	2020/21 Annual Report

SAIT Policies & Procedures	
curriculum review	AC 2.24.1
course outline and maps	AC.2.24.2

SAIT HPS website	https://www.sait.ca/sait-schools/school-of-health-and-public-safety

SAIT EDI website	
landing page	https://www.sait.ca/about-sait/equity-diversity-and-inclusion
Equity, Diversity and Inclusion Training	https://www.sait.ca/about-sait/equity-diversity-and-inclusion/edi-training
EDI Strategy 1st year anniversary	https://youtu.be/sZciPnsjtPU
Inclusion talks	https://www.sait.ca/about-sait/equity-diversity-and-inclusion/inclusion-talks
Understanding pronouns	https://www.sait.ca/about-sait/equity-diversity-and-inclusion/understanding-pronouns
PERS 148: Introduction to Effective Intercultural Communication	https://forms.office.com/Pages/ResponsePage.aspx?id=gyEv9Wef0kq2Vm91T-GWy6VqxMQzm31MmY3nlDDzqihUN09ENkI1MjYwN0k4RVIQVVJOSzc4SkQ3Mi4u

Pride at SAIT	
landing page	https://www.sait.ca/student-life/pride-at-sait
How to be an Ally	https://youtu.be/xS5FMErj0SE
Universal washroom	https://www.sait.ca/assets/images/sait/in-body-and-galleries/student-life/in-pride-campus-map-45x582.jpg

Competency profile	
NEW CAMRT MRT's	https://www.camrt.ca/wp-content/uploads/2021/10/National-Competency-Profile-2019.pdf
Current CAMRT MRT (NM)	https://www.camrt.ca/wp-content/uploads/2018/08/Modified-NM-Profile-Final-.pdf
Current CAMRT MRT (R)	https://www.camrt.ca/wp-content/uploads/2018/08/Modified-Rad-Tech-Profile-Final.pdf
Sonography Canada	https://sonographycanada.ca/app/uploads/2021/10/Sonography-Canada-NCP-6.1-EN-for-website-10.20.2021.pdf

Appendix A AU REB approval

Athabasca University
RESEARCH CENTRE

CERTIFICATION OF ETHICAL APPROVAL

The Athabasca University Research Ethics Board (REB) has reviewed and approved the research project noted below. The REB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2) and Athabasca University Policy and Procedures.

Ethics File No.: **24623**

Principal Investigator:
Ms. Sidsel Pedersen, Graduate Student
Faculty of Health Disciplines\Master of Health Studies

Supervisor:
Dr. Lynn Corcoran (Supervisor)

Project Title:
Understanding of the barriers that influence educators when creating transgender gender diverse content in medical imaging programs.

Effective Date: January 31, 2022 **Expiry Date**: January 30, 2023

Restrictions:

Any modification or amendment to the approved research must be submitted to the AUREB for approval.
Ethical approval is valid *for a period of one year*. An annual request for renewal must be submitted and approved by the above expiry date if a project is ongoing beyond one year.

A Project Completion (Final) Report must be submitted when the research is complete *(i.e. all participant contact and data collection is concluded, no follow-up with participants is anticipated and findings have been made available/provided to participants (if applicable))* or the research is terminated.

Approved by: **Date: January 31, 2022**

Barbara Wilson-Keates, Chair
Faculty of Health Disciplines, Departmental Ethics Review Committee

Athabasca University Research Ethics Board
University Research Services, Research Centre
1 University Drive, Athabasca AB Canada T9S 3A3
E-mail rebsec@athabascau.ca
Telephone: 780.213.2033

Appendix B SAIT REB Approval

REB Certificate of Approval

April 11, 2022

PI: Ms. Sidsel Pedersen

Department: School of Health and Public Safety, Southern Alberta Institute of Technology (SAIT)

Co-Investigators: Ms. Sidsel Pedersen (Principal Investigator) Ms. Jennifer Brown (Supervisor)

Project Title: Understanding of the barriers that influence educators when creating transgender and gender diverse content in medical imaging programs.

Approval Date: February 01, 2022

End Date: July 31, 2022

> The protocol and consent form for the above-named project have been reviewed by the SAIT Research Ethics Board (REB) and were found to be acceptable on ethical grounds for research involving human subjects. Any modifications to the protocol or consent form which are not approved by the REB will render this Certificate of Approval null and void.
>
> Approval of the Research Ethics Board:
>
> Leslie Pidcock, REB Chair

This Certificate of Approval is valid for the above term provided there are no changes in the experimental procedures, protocol or consent form.

Appendix C Recruitment Poster

PARTICIPANTS NEEDED FOR
RESEARCH IN DEVELOPMENT OF TRANSGENDER AND GENDER DIVERSE CURRICULUM IN MEDICAL IMAGING PROGRAMS

We are looking for volunteers to take part in a study that will help gain insight to the factors impacting faculty members in creating and delivering TGD content in medical imaging programs.

As a participant in this study, you would be asked to participate in an interview on SAIT campus.

Your participation is **entirely voluntary** and would take up no more than 1 hour of your time. By participating in this study, you will help us to understand the perceptions of faculty members in creating TGD curriculum.

No risks are anticipated with this study

In appreciation for your time, you will receive *a $50 Amazon gift card*

To learn more about this study, or to participate in this study, please contact:

Principal Investigator:
Sidsel Pedersen MHST student, Athabasca University
spedersen3@athabasca.edu

This study is supervised by: Lynn Corcoran Phd, RN (lynnc@athabascau.ca)

This study has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns about your treatment as a participant, the research, or ethical review processes, contact the Research Ethics Officer at 1.780.213.2033 or by e-mail to rebsec@athabascau.ca

Appendix D Participant Consent Form

Factors influencing creation/delivery of transgender and gender diverse content in medical imaging programs

Principal Researcher:

Sidsel Pedersen

spedersen3@athabasca.edu

Supervisor:

Lynn Corcoran

lynnc@athabascau.ca

You are invited to participate in a research study to help gain an understanding of how various factors effect faculty members' ability to create and deliver transgender and gender diverse (TGD) content. I am conducting this study as a requirement to complete my Master of Health Studies degree through Athabasca University.

As a participant, you are asked to take part in an in-person interview to share experiences with developing TGD curriculum. The interview will take no more than 60 minutes.

The benefits of participating in this study is to bring awareness of the supports needed for faculty to create TGD content. Participants will receive a $50 gift certificate for Amazon.

Involvement in this study is entirely voluntary and you may refuse to answer any questions or to not share information. You may withdraw from the study at any time up to and including the transcript review period. Withdrawal can be done by emailing the PI or supervisor. If you choose to withdraw from the study after the interview data has been transcribed the audio and written transcription will destroyed.

You will be provided transcripts to review after the interview has been completed. Comments or clarifications can be made by emailing the PI within 7 days. If you wish to withdraw any parts of the interview, this must be done within 7 days. Deleted data will not be used in the study. After the transcripts have been approved the data will be fully anonymized prior to analysis, and it will no longer be possible to remove specific participants data.

Participation will remain confidential through all stages if of the study. Faculty and administrators from my campus will neither be present at the interview nor have access to notes or transcripts.

Audio recordings of the interviews will be transcribed using Otter AI and transcriptions will be stored on Microsoft Cloud Services and password protected. All personal identifying information of participants will be removed in transcriptions. After transcription of interviews is complete the audio files will be destroyed.

If you have any questions about this study or require further information, please contact Sidsel Pedersen or Lynn Corcoran using the contact information above.

This project has been reviewed by the Athabasca University and SAIT Research Ethics Board. Should you have any comments or concerns about your treatment as a participant, the research, or ethical review processes, please contact the Research Ethics Officer by e-mail at rebsec@athabascau.ca or research.ethics.board@sait.ca

CONSENT:

I have read the Letter of Information regarding this research study, and all of my questions have been answered to my satisfaction. I will keep a copy of this letter for my records.

My initials and signature below confirm that:

____ I understand the expectations and requirements of my participation in the research;
____ I understand the provisions around confidentiality and anonymity;
____ I understand that my participation is voluntary, and that I am free to withdraw at any time with no negative consequences;
____ I am aware that I may contact the researcher and/or research supervisor, or the Research Ethics Officer if I have any questions, concerns or complaints about the research procedures or ethical approval processes.
____ I understand that the data I provide will be anonymized and that data set (or sets) from this project will be deposited in Microsoft Office 365.

Name: _____

Date: _____

Signature: _____

By initialing the statement(s) below,

_____ I am granting permission for the researcher to use an audio recorder

_____ I acknowledge that the researcher may use specific quotations of mine, without identifying me

_____ I would like to receive a copy of the results of this research study by e-mail

If you are willing to have the researcher contact you at a later time by e-mail or telephone for a brief conversation to confirm that I have accurately understood your comments in the interview, please indicate so below. You will not be contacted more than six months after your interview.

_____ Yes, I would be willing to be contacted.

Appendix E Interview Guide

Demographic questions:

- How many years of experience do you have as a technologist in the medical imaging profession?
- How many years of teaching experience do you have?
- What is your current role? (didactic/clinical/ F/T P/T. in-person/virtual)
- Do you currently practice in a clinical environment in your registered profession?

Topic questions

Introduction

1. Describe your pathway of becoming a medical imaging technologist.
2. Describe your pathway of becoming a faculty member.
3. What drew you toward this profession?

Course Maintenance

4. How long have you been teaching your course(s)?
5. Describe the origin of the content in your course(s). Have you created the content or is it legacy content?
6. What are the current challenges you face when you are creating new content?
7. What are the current challenges you face when updating content in your course(s)?
8. What institutional supports are present for you when you are updating and creating content?
9. What institutional supports are present for you when you are updating curriculum in your course(s)?

Exposure to TGD terminology.

10. In your own words please define transgender and gender diverse content. What types of examples (if any) can you think of? (not necessarily from your courses)
11. To what extent do you feel TGD curriculum is currently presented in program content?
12. What are examples of areas in your course where you feel adding TGD content is appropriate? Are there any areas where it feels inappropriate?
13. What kinds of conversations have you had with colleagues around this? On campus? What's the vibe?

Familiarity/experience with TGD populations questions

14. Describe your exposure with TGD related experiences:
    A. on SAIT campus. *(Prompts: Pride, EDI activities, TGD students/staff policies/procedures, email signature)*
    B. in your personal life *(Prompts: friends, family, other relations)*
    C. (if working in clinical environment)
15. How else are you exposed to TGD community (either on campus, in your personal life or as a technologists)
    A. Informal – *(Prompts) social media, pop culture*
    B. Formal learning – *(Prompts) webinars, courses*

Concluding question

Is there anything else you feel I should ask the next participant?