

The Good Student or the Good Patient? The Barriers Encountered by Undergraduate Medical Students with Disabilities at the Northern Ontario School of Medicine

by

Rachel Belanger

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APPROVED/APPROUVÉ

Thesis Examiners/Examineurs de thèse:

Dr. Elizabeth Levin
(Supervisor/Directeur(trice) de thèse)

Dr. Diana Urajnik
(Committee member/Membre du comité)

Dr. Jason Shack
(Committee member/Membre du comité)

Dr. Allyson Harrison
(External Examiner/Examineur externe)

Approved for the Office of Graduate Studies
Approuvé pour le Bureau des études supérieures
Tammy Eger, PhD
Vice-President Research (Office of Graduate Studies)
Vice-rectrice à la recherche (Bureau des études supérieures)
Laurentian University / Université Laurentienne

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Abstract

The American Association of Medical College's (AAMC) Lived Experience report was released in March 2018 with hopes of broadening the diversity of medical students to include more of those with disabilities (Meeks & Jain, 2018). The authors hoped to generate discussion and study the lived experiences of current medical students, residents and practicing physicians with disabilities to learn about the barriers and supports that they have and continue to encounter along their journeys in medicine. In response to the Meeks & Jain (2018) publication, the purpose of this study was to replicate their study with the research question "What are the barriers encountered by undergraduate medical students with self-identified disabilities at one Northern Ontario medical school?". The Lived Experience Project provides a unique opportunity to learn about, and compare the experiences of, participants in this study to medical students at one medical school in Northern Ontario (Meeks & Jain, 2018). In doing so, the climate and culture of this school and how this affects the treatment and education of students with disabilities, including the barriers they face in the academic accommodation process, in medical environments and throughout medical school as a whole were explored.

A qualitative descriptive study design was used. Data was collected using an initial demographics-based survey followed by a semi-structured interview. Interviews were conducted in person or by telephone. Data was transcribed and analysed using Braun & Clarke Thematic Analysis (2013). It was found that the participants of this study found barriers directly associated with their medical education in addition to barriers indirectly associated with their medical education and finally, barriers outside of medical school. Supports in the lives of participants were also identified as a theme in the current research, suggesting a positive impact in the lives of medical students with disabilities. No barriers specific to being a student in Northern Ontario arose, which may be in part to the nature of the sample and small sample size. Implications for this research include reviews of accommodation policies, revision of technical standards at a national and institutional level as well as strengthened communication between the student, the medical school, faculty, and administration.

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Table of Contents

Abstract.....	iii
Acknowledgements.....	iv
Table of Contents.....	v
List of Appendices.....	ix
Introduction	1
<i>Literature Review</i>	<i>2</i>
Defining Disability and Models of Disability	3
Individuals with Disabilities in Ontario and Canada	6
Disabilities in Post-Secondary Education	6
Disabilities in Medicine	9
Experiences of Individuals with Disabilities in Medicine	12
Performance of Students with Disabilities	16
The Application Process and Technical Standards	18
Academic Accommodation	23
Attitudinal Barriers and Stigma	26
Disability Curriculum	30
The Lived Experience Project	32
<i>Reflexivity</i>	<i>34</i>
<i>Research Question</i>	<i>35</i>
<i>Theoretical Framework</i>	<i>37</i>
Describing the Social Ecological Model	37
Applying the Social Ecological Model	38

Methods.....	40
<i>Participants</i>	40
<i>Study Design</i>	41
<i>Procedure</i>	42
Recruitment	42
Setting	43
Data Collection	44
Data Analysis	45
<i>Limitations and Validations</i>	45
Limitations	45
Validations	46
Results	47
<i>Barriers directly associated with medical education</i>	47
Foreseeing barriers in medicine	47
Barriers to the application and interview process	49
Academic barriers	51
Clinical placement barriers	53
Barriers to the accommodation process	56
A lack of knowledge from professors, disability personnel, and preceptors	61
Social Barriers: Feeling judged, stigmatized and self-stigmatization	64
<i>Barriers indirectly associated with medical education</i>	66
Invisible disabilities	66
Communication barriers	68

<i>Other themes</i>	70
Barriers outside of medical school	70
How their disability has impacted their journey in medicine	72
<i>Summary of results</i>	75
Discussion	77
<i>Barriers directly associated with medical education</i>	77
Foreseeing barriers in medicine	77
Barriers to the admission process	78
Academic barriers	80
Clinical placement barriers	83
Barriers to the accommodation process	84
A lack of knowledge from professors, disability personnel, and preceptors	86
Social Barriers: Feeling judged, stigmatized and self-stigmatization	88
<i>Barriers indirectly associated with medical education</i>	89
Invisible disabilities	89
Communication barriers	90
<i>Other themes</i>	92
Barriers outside of medical school	92
How their disability has impacted their journey in medicine	93
<i>Summary of Key Findings</i>	94
<i>Implications and Recommendation</i>	96
Suggestions for future research	96
Recommendations for NOSM	97

Recommendations for policy change	98
<i>Study Strengths</i>	99
<i>Study Limitations</i>	100
Conclusion	102
References	103
Appendices	116

List of Appendices

Appendix A – A1 - Laurentian University Research Ethics Approval Certificate	117
A2 - Lakehead University Research Ethics Approval Certificate	118
Appendix B – Sample Recruitment Poster	119
Appendix C – Sample Letter of Information and Sample Letter of Consent	120
Appendix D – Initial Survey and Semi-Structured Interview Protocol	123

The Good Student or The Good Patient? The Barriers Encountered by Undergraduate Medical Students

In the words of Desmond Tutu (2010), “inclusive, good-quality education is a foundation for dynamic and equitable societies”. In an age where we place great focus on inclusive education, more research is required on the inclusion of students with disabilities in post-graduate and professional settings, specifically in undergraduate medical education. Achieving diversity in medical schools is a goal that the American Association of Medical Colleges (AAMC, 2014; AAMC, 2015; Meeks & Jain, 2018) has been aiming to achieve for over a decade. While past AAMC reports have targeted the inclusion of gender, race and ethnicity in medicine, recently they have focused on the inclusion of students with disabilities, with the goal of ensuring all those qualified to learn medicine have the opportunity to do so (AAMC, 2014; AAMC, 2015; Meeks & Jain, 2018). In not being inclusive to students with disabilities, injustice is provided to the many patients with disabilities because diversity in health care professionals leads to an improvement in patient outcomes (Cohen, Gabriel & Terrell, 2002). Specifically, Meeks and Jain (2018) found that for all medical students, diversity and inclusion are two factors related to greater self-rated preparedness to care for minority patients, such as those with disabilities. Students and physicians with disabilities often note that their disability is a source of experience that helps them to better understand and care for their patients (VanMatre, Nampiaparampil, Curry & Kirschner, 2004). Additionally, medical students and physicians with disabilities benefit minority patients, and specifically, those with disabilities, because of their shared and similar experiences, which results in greater empathy and improves patient outcomes (McKee et al., 2016).

Considering that the rate of self-reporting of disabilities from 2014-2016 was close to 11.5% for undergraduate students yet fell to an average of 2.5% for medical students, it is necessary to question why this difference occurs (Meeks & Jain, 2016). These numbers are minute when considering that 22.3% of Canadians ages 15 and older were living with a disability in 2017 (StatsCan, 2018). These numbers refer to physical, sensory, learning and psychological disabilities, comprehensively including a wide range of disabilities. Additionally, Ricketts, Brice and Coombes (2010) found that in 2005, the number of students with disabilities increased significantly by graduation from medical school, due to the onset of new disabilities. Upon greater understanding of the definition of disability, the number of medical students that self-identify with a disability more than doubled (Miller, Ross, & Cleland, 2009). A lack of knowledge about disabilities leads to the formation of negative attitudes and stigmatization, potential reasons for why there is underreporting of disabilities from medical students, in addition to the effect that it may have on their self-esteem and the high-stakes environment of medical school.

There is a deficit of literature from Canadian universities about medical students with disabilities, the barriers they encounter, as well as the academic accommodation process, and most of the current literature is based on American and international education. While there are many similarities, Canadian medical schools differ substantially concerning the population of students, educational systems, and the legal systems that implement laws related to disability. Thus, not only is there a need to identify and understand the barriers encountered by medical students with disabilities in Ontario and Canada, but there is a need to examine how we can reduce and eliminate the barriers that these students face in their individual journey, and for medical students with disabilities as a whole. This means considering the global journey of

medical school and the many opportunities for barriers to arise, from the application process and technical standards to the accommodation process and beyond. It is hoped that this research provides a voice to undergraduate medical students with disabilities and to describe the barriers experienced by these students by collecting data and learning about their perspectives as insiders to this experience.

This thesis consists of four sections. The first section includes an introduction and background information relevant to the research topic, a literature review along with reflexivity, details on the theoretical framework and the research question. It begins with a definition of disability and then the second section contains an overview of the methods. The third section consists of the results. The last section consists of the discussion, a summary of the study and literature findings, study strengths and limitations, implications and recommendations for the future, and a conclusion.

Defining Disability and Models of Disability

As defined by the World Health Organization in 2020, a disability is an

...impairment as a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations...Thus disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives.

Other associations present other definitions of disability, although many are similar. The Association of Faculties of Medicine of Canada defines disability as “any restriction or lack

(resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being.” Meanwhile, the Ontario Human Rights

Commission (2005) code broadly defines disability as

1. Any degree of physical disability, infirmity, malformation or disfigurement that is caused by bodily injury, birth defect or illness and, without limiting the generality of the foregoing, includes diabetes mellitus, epilepsy, a brain injury, any degree of paralysis, amputation, lack of physical co-ordination, blindness or visual impediment, deafness or hearing impairment, muteness or speech impairment, or physical reliance on a guide dog or other animal or on a wheelchair or other remedial appliance or device, #
2. A condition of mental impairment or a developmental disability, #
3. A learning disability, or a dysfunction in one or more of the processes involved in understanding or using symbols or spoken language, #
4. A mental disorder, or #
5. An injury or disability for which benefits were claimed or received under the insurance plan established under the *Workplace Safety and Insurance Act, 1997*). #

These complex definitions apply to a wide range of disabilities and do not impose restrictions based on the physiological bases of illness, disease or injury. The definitions also highlight the diverse and complex consequences that arise as a result of a disability. For the purpose of this research, key ideas of the definition of a disability include the fact that a disability is an impairment leading to limitations or restrictions occurring in day-to-day life

and refers to a wide range of impairments that include but are not limited to physical, sensory, motor, neurological, psychological and learning disabilities.

In the past, a biomedical model was applied to individuals living with a disability and this model portrays disability as the physical definition of an individual requiring treatment (Shakespeare, 2013, pg. 215). More recently, individuals and advocates of individuals with disabilities have used the social model of disability in response to the weaknesses of the biomedical model (Shakespeare, 2013). In contrast to the biomedical model, the social model removes focus on the individual and examines ways of removing barriers from society (Llewellyn & Hogan, 2000). As stated by Ware (2010), “disablement within the social model is understood as produced through externally imposed barriers that oppress individuals with disabilities and prevent their access to, and inclusion within, all walks of life” (pg. 251). Instead of being a disabled individual, this model presents the individual as someone living with a disability, eliminating their disability as a defining feature of their being and instead, something that they live with. This is what we call ‘people-first language’ and its use helps to prevent disability as being a political phenomenon (Titchkosky, 2008). This review will focus on disability in medicine and healthcare professions, where the barriers encountered are possibly amplified by the stigma and negative attitudes that exist towards individuals with disabilities (Meeks & Herzer, 2016; Stergiopolous, Fernando & Martimianakis, 2018). Not only can this stigma sometimes be imposed by able-bodied individuals, but there can also be self-stigmatization by health care professionals living with disabilities (Henderson et al., 2012). With the push for diversity in medicine and inclusion of individuals with disabilities (Meeks & Jain, 2018), there is a need to adopt the concepts of the social model of disability in medical education

in order to uncover and understand the ways in which individuals with disabilities may be oppressed in their day-to-day lives (Oliver, 2009).

Individuals with Disabilities in Ontario and Canada

In Canada, there are more than 6.2 million people or 22.3% of the population living with a disability (StatsCan, 2018). Canadian with disabilities face higher rates of unemployment, lower levels of education (Turcotte, 2014) and overall, lower personal income (StatsCan, 2018). The unemployment rate for adults with disabilities is more than double that of their able-bodied peers, where individuals with disabilities face an unemployment rate of 41% compared to about 20% for persons without disabilities (StatsCan, 2018). As the severity of an individual's disability increases, so does the unemployment rate (StatsCan, 2018). Research has found that close to one quarter of the individuals living with disabilities cannot afford the technology, devices and medications needed to care for their disability (StatsCan, 2018). In Ontario, there are policies to support individuals with disabilities such as the Ontario Disability Support Program (ODSP) which was initially established in 1997 (Ontario Disability Support Program Act 1997). The goals of ODSP are to provide income support and programs to support employment of individuals with disabilities, but the program has its own barriers as it can be tricky to navigate the application process and some consider the monthly support incomes to be inadequate (Trick, 2018; Crooks, 2004).

Disabilities in Post-Secondary Education

As of 2013, between 10-15% of college students and 5-7% of university students were living with a disability or using disability services (McCloy & Declou, 2013). Over the past 50 years, there has been continuous growth in the number of individuals with disabilities pursuing

and completing higher education in Ontario and Canada (McCloy and Declou, 2013; Hill, 1992). This has been supported by universities developing policies to accommodate students with disabilities and as time progresses, revision of these policies as new encounters with students with disabilities helps us to clarify, rewrite and adjust these policies. That being said, individuals with disabilities continue to be underrepresented in post-secondary education which in part may be due to barriers faced in their secondary education, issues with accessibility and other social factors (Chatoor, 2021).

One such way that colleges and universities are increasing the accessibility of post-secondary education to all, including individuals with disabilities, is through universal design. As defined by the National Disability Authority and Centre for Excellence in Universal Design (2020), universal design is

the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability. An environment should be designed to meet the needs of all people who wish to use it... By considering the diverse needs and abilities of all throughout the design process, universal design creates products, services and environments that meet peoples' needs.

Universal design does not solely apply to education, but to the many aspects of daily life. In considering this approach with education, not only does it apply to the learning environment, but also to the way that courses are developed and offered and methods of assessment. Universal design has begun to be applied worldwide and used for elementary, secondary and post-secondary education (Government of Ontario, 2013).

In post-secondary education, students must learn to navigate their education, the administration as well as their personal life. For students with disabilities, many must also navigate the accommodation process. In a 2017 American study, Waterfield and Whelan considered the barriers to access for students with learning disabilities and found that socio-economic status is one factor affecting students' access to accommodations. The authors posited that students with lower socio-economic status lack cultural and social capital that help reduce some of the stigma encountered by students with disabilities, adding to the challenge of accessing accommodations (Waterfield & Whelan, 2017). This suggests that at least in the United States, in addition to facing stigma related to their disability, there are other social, economic and personal factors that affect individuals with disabilities in pursuing post-secondary education and in day-to-day life.

The literature provides several examples of the experiences of students with disabilities pursuing post-secondary education in Canada, many of which discuss the challenges faced by these students. Mullins & Preyde (2013) examined the experiences of students with invisible disabilities in Canada. Although they found that having an invisible disability can help students be treated equally to their peers, students faced social and organizational barriers that hindered their university experience. Similarly, in another study considering female students with disabilities pursuing undergraduate and graduate studies at university in Canada, it was found that the attitudes of others, including peers and professors, shaped their university experiences – often for the worse (Erten, 2011). Negative attitudes can add to the stigmatization experienced by students with disabilities, whether it is implicit or explicit. Together, these different experiences and barriers add to the demands of students taking on the challenges of post-secondary education.

Disabilities in Medicine

While the number of medical students and physicians with disabilities is low, those that fall into this group represent a diverse group of people working in various fields of medicine (Wainapei, 1987). In 2017, 22.3% of Canadians ages 15 years and older were living with a disability (StatsCan, 2018). From December 2014 to January 2016, Meeks & Herzer (2016) conducted a study and found that 2.7% of enrolled medical students in the U.S. self-identified as having a disability. This number represented individuals with neurological and developmental disabilities like ADHD, learning disabilities, psychological disabilities as well as physical and sensory disabilities. The Meeks & Herzer (2016) article is one of few that considers medical students with disabilities as a whole and thus, there is little other research verifying this number. Many of the research articles that do exist examine one type or one group of disabilities, resulting in a lack of data about the overall state and numbers of medical students with disabilities (Asghar et al., 2018; Donlan, M., 2016; Moutsiakis & Polisato, 2010).

In a separate study, Moutsiakis and Polisato (2010) found that 0.15% of medical students who graduated between 2002 and 2005 across medical schools in the U.S. lived with a physical disability. A cross-sectional survey at 3 different time points was used to examine medical students with disabilities across 123 medical schools. Not surprisingly, in conducting this research, the response rate was low, where 40/123 schools responded. In part, the response rate was so low because very few people working in student affairs had access to the information needed to complete this survey and it was disability services offices that had the access. Of the 40 schools that did reply, two of the schools accounted for more than half of the students with physical disabilities. This could reflect poor study design and methodology or could be because some schools are more committed to diversity and inclusion of individuals with disabilities, such

as the University of Michigan, which is working toward the development of a centre for disability in medicine (Meeks, 2019). Other schools, such as those identified by Zazove and colleagues (2016), are suggested to systematically exclude students with disabilities from the access and availability of technical standards to the willingness to provide accommodations to students with a range of disabilities. In the United States, accommodations are mandated by law through the Americans with Disabilities Act. While Canada does not have an equivalent to the Americans with Disabilities Act, Ontario has the AODA (Accessibility for Ontarians with Disabilities Act), which was enacted in June 2005. Such laws set the basis for promoting the inclusivity and diversity of individuals with disabilities, ensuring that their disability is not the sole reason for exclusion from any number of activities, and establish a standard for the implementation of accommodation for students and employees throughout Ontario.

One of the surprising findings of Moutsiakis and Polisato's (2010) research was that the number of individuals with a pre-existing disability admitted to medical school actually declined in comparison to research done before the American with Disabilities Act was enacted in 1990. The authors concluded that this may be in part due to admission standards, such as technical standards and the interview process, which act as barriers for students with a disability (McKee et al., 2016; Zazove et al., 2016; Moutsiakis & Polisato, 2010). Other reasons could include changes in the way this information is collected or students choosing not to report a disability.

On the other hand, research by Moreland, Latimore, Sen, Arato and Zazove (2013) considered the population of medical students and physicians who are deaf or hard of hearing (DHoH). This was a national study done to consider the unique barriers, required accommodations and specialties in which these individuals practice. It was found that primary care is the main specialty in which DHoH physicians' practice. Uniquely, DHoH medical

students and physicians are best able to service DHoH patients. For those who are DHoH, they often immerse themselves in the DHoH culture and community and see their deafness or hard of hearing as a personal characteristic rather than a disability. The benefit of DHoH physicians is that they can use American Sign Language and communicate effectively with DHoH patients, and as a result of the corresponding cultures and abilities, it can lead to higher use of appropriate preventative care services for DHoH patients. With regards to the accommodations that are available and accessible to DHoH medical students and physicians, Moreland and colleagues (2013) found that most typically require more than one accommodation. Modified and amplified stethoscopes are commonly used, allowing these individuals to use what residual hearing they may have. Other accommodations include other forms of auditory equipment, computer-assisted real-time captioning, as well as signed interpretation. These individuals often invest much of their own time arranging such accommodations, taking up anywhere from 0-10 hours per week. Additionally, DHoH medical students and physicians face communication barriers that affect their abilities to find jobs, and these individuals feel that people misunderstand how hearing loss affects communication. One of the authors of this paper, Dr. Christopher Moreland, a DHoH physician himself, says that deafness does not impede his medical practice at all, and he has come to realize that it is more important to focus on his patients rather than his own disability (as cited by Henkel, G, 2014). As a result of the diverse population of DHoH medical students and physicians working in different areas of primary care with unique accommodation needs, institutional support is required in order to promote career satisfaction and optimize patient care in this population.

Experiences of Individuals with Disabilities in Medicine

Medical students with disabilities experience the perspective of both the student and the patient (Stergiopoulos, Fernando & Martimianakis, 2018). They encounter the challenges of medical school, their disability, and the combined role (Stergiopoulos et al., 2018). Many of these individuals have had the opportunity to share their experiences, in research articles to journal editorials and even in the news. These stories continue to create hope for young students with disabilities with goals to pursue medicine and for those who continue to encounter barriers in their lives. That being said, these stories are not all positive, and for many, attending medical school with a disability has added further stress and emotional turmoil (Stergiopoulos et al., 2018; Donlan, 2016; Miller et al., 2009).

Stergiopoulos and colleagues' (2018) qualitative research provides an in-depth examination of the experiences of undergraduate medical students with self-identified disabilities at the University of Toronto from July 2016 to March 2017 (Stergiopoulos et al., 2018). Critical discourse analysis was used to learn about the experiences of these individuals and the researchers also conducted text analysis on documents regarding student wellness from all 13 Canadian medical schools. Many participants reported that they felt like they were constantly trying to balance two contradicting roles imposed by the institution as a result of the attitudes held towards student wellness. These roles are that of the “good student”, as medical learners, and that of the “good patient”, as individuals with a disability. Students felt that there were challenges to disclosing a disability to peers and faculty as a result of the existing stigma, vulnerability and fear that others would think them incompetent. While the learning of these students focused on the medical sciences aspect of disease, there was less discussion about the illness experience of individuals with disabilities. As a result, the authors suggested that taking

the experiences of students with disabilities into consideration and listening to their stories and experiences is an opportunity to teach compassion to those involved in a students' education. The authors concluded that institutions should take active measures to provide support to students with disabilities in order to ensure equal opportunities in undergraduate medical education. Suggestions include improvements in accessibility to content and accommodations as well as a need for curriculum to draw on individual experiences of illness and disability.

Henderson and colleagues (2012) used a qualitative descriptive design to explore the experiences of doctors in the United Kingdom who had been away from work for at least 6 months due to illness, injury or permanent disability and to learn about the barriers preventing them from returning to work. Many individuals chose not to participate in this research because of fear of potential breaches of confidentiality and/or anonymity, but of the physicians who did participate, the majority had negative views of themselves and their struggles with their health. They considered their health struggles to be a part of their identity and as a result of extended physical or mental illness, this led to self-stigmatization. Self-stigmatization is a part of the greater phenomenon we know as stigmatization and is defined as the process in which a person with mental illness, physical illness or a disability becomes aware of public stigma or subjective feelings of stigma, agrees with those stereotypes, and internalizes them by applying them to oneself (Corrigan, 1998). Individuals who self-stigmatize have lower self-esteem, decreased self-efficacy and less confidence in their future (Corrigan, 1998). Henderson and colleagues (2012) found that the time away from work led to many doctors questioning their identity as physicians and their commitment to practice. These doctors developed negative and self-destructive self-images and self-reported feelings of failure. During their periods of illness, they had negative experiences with family members as well as colleagues, but many also received words and

gestures of support that counteracted some of the more negative experiences. Sometimes, in an attempt to prevent negativity in close relationships, these doctors attempted to conceal their difficulties in their personal relationships. The authors concluded that there is a lack of resources or strategies and access to the aforementioned that these physicians could use to come to terms with their feelings and in beginning the return-to-work process.

In consideration of the long-term effects of individuals working with a disability, the career trajectories of nurses and physicians across the U.S. who had been diagnosed with a disability before or after their training have been followed (Neal-Boylan et al., 2012). Using a qualitative descriptive method, researchers conducted interviews with 10 nurses and 10 physicians who had disabilities including sensory impairments, neuromuscular conditions, chronic heart conditions or cerebrovascular disease and other pain syndromes. Respondents found that living with and working with a disability narrowed their career choices. This was particularly true for those who had their disability prior to training. While many recognized their limitations and the need to make career choices based on their disability, others felt coerced into making these decisions. Respondents also struggled with decisions as to whether to disclose and discuss their disabilities. As for many who live with a disability, these individuals feared that they would not be hired for certain positions or that they would be treated differently if others knew about their disability. Interpersonal interactions often reflected the institutional climate and set the tone for how welcome nurses and physicians with disabilities felt at work. In particular, supervisors and administrators influenced the climate of the work environments and the attitudes and behaviours of others. While there was great appreciation for colleagues who were supportive and welcoming, most respondents experienced stigma in their workplace. While legally guaranteed, respondents rarely sought workplace accommodations, and instead viewed their

patients' safety as a personal responsibility. Finally, throughout their journeys, respondents experienced a spectrum of emotions from anger and grief to hope and optimism because of the workplace challenges and support they encountered. This study suggests that we need further guidance on how workplaces can best adhere to laws supporting individuals with disabilities and to raise awareness and create a sense of welcoming for these individuals in the workplace.

In addition to research on the experiences of medical students, physicians and other health care professionals living with disabilities, there are many editorials, commentaries and news articles delving into the struggles and successes of various individuals. For example, a newspaper article was written about one physician who had always dreamed of pursuing medicine but was in a skiing accident that led to her becoming quadriplegic, and without the words of support from a professor in university, wouldn't have even applied to medicine (as cited by Templeton, 2013). Another example is that of Dr. Helen Taussig, born in 1898 and the first woman to be president of the American Heart Association in 1965. By the time Dr. Taussig graduated from John Hopkins Medical School in 1927, she had lost almost all of her hearing. However, her hearing loss did not stop her from pursuing a career in cardiology and it was actually her inability to hear that led to innovations in cardiology focusing on distinguishing rhythms of normal and damaged hearts by touch and not sound (NIH, n.d.). For those articles appearing in scientific journals, the authors' list often includes individuals who have the experience of living with a disability, such as in Schwarz and Zetulik's (2019) article. These authors used their personal experiences to expand on some of the obstacles that exist for physicians with disabilities and suggested solutions to better treat and include physicians with disabilities. Suggestions included addressing our personal biases, building networks of future, current and past physicians with disabilities, and advocating for the benefits of having physicians

with disabilities. Emerson (2017) wrote an article about his experiences of being a visually impaired medical student and discussed the struggles and negative encounters with peers and preceptors, but also shared his own role in advocating for himself, addressing the importance of strong communication.

Past physicians with disabilities play a great role in why we have a greater awareness of them today. Dr. Muzumdar founded the Canadian Association of Physicians with Disabilities in 1999 as the sole member, after losing his vision in the late 1980s. After personally living with a disability, he realized that there was no demographic information on this group of people and he made the commitment to bring Canadian physicians with disabilities together and to have an inclusive association (Canadian Association of Physicians with Disabilities, n.d.). The association is now affiliated with the Canadian Medical Association and works to increase awareness and support medical students and physicians with disabilities.

Performance of Students with Disabilities

While success for medical students and aspiring physicians with disabilities is possible, these individuals must overcome many personal, administrative and social hurdles in order to succeed (Stergiopoulos et al., 2018). Students with a wide range of disabilities can be and have been successful in their medical school journeys, but specific disabilities may limit an individual's future specialty choices (Meeks & Jain, 2018).

Success in medical residency with a disability is achievable as demonstrated by the case report of an anesthesiology resident with attention-deficit/hyperactivity disorder (ADHD) (Fitzsimons, Baker, Brookman, Arnholz & Baker, 2016). A male anesthesia resident physician with ADHD in the United States was followed throughout his residency and over the following 5

years of practice. Academic accommodation and support in the academic and clinical settings benefitted this individual during his medical studies and these same tools helped balance his journey through residency. Self-advocacy for students with disabilities was highlighted, such that these students must take responsibility for themselves and know their limits. While this article covered the case of a single male resident physician in-depth for close to 10 years, there is the potential for selection bias. The success of this individual is likely not representative of the experiences of all students with ADHD or other disabilities and many in his position may not have even made it to medical school or chosen to pursue anaesthesiology. The fact that this case report outlined a single individual with a single disability means that the transferability may be limited.

Asghar and colleagues (2018) used a cross-sectional study to examine the performance of candidates disclosing dyslexia in comparison to other students when writing the UK medical licensing exam from 2010-2015. This included 2.6% of 14851 exam writers who wrote the UK medical licensing exam called the Applied Knowledge Test. Those candidates who declared a diagnosis with supportive documentation were offered an accommodation, such as extra time, in hopes of reducing any potential disadvantages. Of the 386 students that declared dyslexia, 320 requested an accommodation. Individuals with dyslexia did not achieve significantly lower pass rates than their peers without a disability. Similarly, Ricketts and colleagues (2010) found that when medical students with learning disabilities were given extra time for multiple-choice exams, there was no significant difference in mean test scores between groups and across years for students with a learning disability compared to those without. Ali, Zahra, Coelho, Jones and Tredwin (2017) found that undergraduate dental students with learning disabilities across four cohorts who used accommodations were neither advantaged nor disadvantaged relative to their

peers without a disability. Instead, the use of accommodation, such as extra time or writing the exam in a separate room, resulted in students at par with their peers.

In addition to considering the performance of students writing a licensing exam, Teherani and Papadakis (2013) also considered the clinical performance of medical students with disabilities in the United States. Their research was performed using a retrospective cohort design with a sample from the University of South Florida between 1987 and 2009. The sample consisted of 59 students with disabilities matched with 171 students without disabilities, where students were matched for age, sex, and year of matriculation. The results suggested that students with disabilities had a lower graduation rate (86.4%) compared to peers without a disability (99.4%) and that students without a disability also outperformed students with a disability on standardized tests. That being said, all students passed clerkship, which is heavily focused on clinical skills and performance. We must be careful when comparing this data to Canadian medical education due to differences in the admissions process, the funding of medical schools as well as the sample of medical students to be considered.

The Application Process and Technical Standards

A critical barrier that can present itself for students with disabilities for entry to medical school is a school's posted technical standards. Technical standards are a set of standards set out by individual medical schools to assess the qualifications of an individual to study medicine (Zazove et al., 2016). In order to successfully matriculate into a medical school, a student must have all the required skills and abilities described in a school's technical standards (Council of Ontario Faculties of Medicine, 2016). In Canada, the Committee on Accreditation of Canadian Medical Schools (CACMS) requires medical schools to develop and publish technical standards

for the application, admission, retention, and graduation of medical students (CACMS, 2018). The AAMC (2019) sets out these standards for U.S. medical schools. While these governing bodies set out the overarching skills to be included in the technical standards, it is up to each school to establish its own standards. Publishing technical standards and having them accessible to students is also a requirement by law, according to the Americans with Disabilities Act (ADA) in the U.S. and by the Accessibility for Ontarians with Disabilities Act (AODA) in Ontario (*Accessibility for Ontarians with Disabilities Act 2005; American with Disabilities Act, 1999*).

For Ontario medical schools, students must meet standards and competencies in areas of observation, communication, motor abilities, intellectual-conceptual, integrative and quantitative abilities as well as behaviour and social attributes (Council of Ontario Faculties of Medicine, 2016). These skills apply not only to the academic portion of learning, but to skills sessions and clinical learning and intend to prepare medical students for residency and eventually independent practice. Ontario is dedicated to inclusive education and the integration of students with disabilities, medical schools' technical standards must also address students with disabilities (Council of Ontario Faculties of Medicine, 2016). This part of their standards must draw attention to the fact that these students have the right to reasonable accommodation in order to meet standards unless the skill in question represents a core competency or essential skill, in which case no accommodation is required by law (Council of Ontario Faculties of Medicine, 2016; Ontario Human Rights Commission, 2002)). Research articles, commentaries, and even court cases continue to address the fact that technical standards need to be better defined (Herzer, 2016; Zazove et al., 2016; VanMatre et al., 2004).

Zazove and colleagues (2016) conducted a national study to document and analyze all of the U.S. Medical Doctor and Doctor of Osteopathic Medicine granting medical schools'

technical standards to identify schools' willingness to accommodate students with disabilities from 2012-2014. Of the 173 medical schools in the United States, only 7% did not have technical standards available. Technical standards are a requirement under the Americans with Disabilities Act, but Zazove and colleagues (2016) found that many schools fail to meet these requirements. In addition to the 7% of schools that did not have technical standards available, another 20% did not have them available online and more than 33% of schools had technical standards that were difficult to locate. Although technical standards are supposed to explicitly state how a school will support students with disabilities, the researchers found that most standards do not. Zazove and Colleagues (2016) suggest that based on their analysis of the contents of technical standards, two-thirds of American medical schools are not willing to or do not provide reasonable accommodation for disabilities affecting vision, hearing or mobility. Overall, the findings suggested the systematic exclusion of students with disabilities by U.S. medical schools. That being said, this statement of systematic exclusion is solely based on the technical standards that were analyzed by the researchers and does not take into consideration the individual experiences of students with disabilities (Zazove et al., 2016). It's important to note only vision, hearing, and mobility disabilities were considered in this work, failing to include other physical disabilities, learning disabilities and psychological disabilities. Additionally, these results do not generalize to Canadian medical education and technical standards and therefore, it would be interesting to analyze the technical standards from Canadian medical schools for comparison.

From a different perspective, VanMatre and colleagues (2004) considered technical standards for entry to medical school and competencies for students to graduate at a school in the U.S. Using a cross-sectional study design, they asked students, residents and faculty members from all specialties at Northwestern University's Feinberg School of Medicine for their opinions

about the importance of these standards and competencies with regards to students with physical and sensory disabilities. While only 5.6% of respondents self-identified as having a physical disability, 70% of respondents across all levels of training disagreed with the fact that a student completing medical school should meet the standards and have the skills to enter any specialty. For example, in certain specialties such as surgical specialties, dexterity, mobility and vision may be more essential than for the specialty of psychiatry, where communication with the patient is crucial. This applies to students with physical disabilities because many of them recognized their own physical limitations and understood that certain specialties, such as surgery, would not be possible with these limitations. Instead, these individuals often enter family medicine or a field that allows them to work to their strengths, rather than their physical limitations. With regard to which competencies were deemed to be most important, responses varied, but most respondents agreed that observation and communication skills top the list, whereas the purely technical skills were of lesser importance. On this note, respondents believed that disabilities that affected motor skills would actually be less of a barrier to the practice of medicine than a disability affecting observation or communication skills. The comments provided by respondents also suggested that there is a need to provide more opportunities for individuals with disabilities to improve the quality of education of future students, to promote acceptance of individuals with disabilities and to provide the highest quality of care to patients. Since this study was performed at a single medical school in the U.S., its generalizability is limited, and further research should be considered. McKee and colleagues (2016) suggest that technical standards need to focus more on students' abilities rather than their limitations. They explain that standards can be categorized as either "organic", focusing on the deficits or limitations of a student, or as "functional", which instead focus on a student's abilities without accommodations. While organic standards require a

student to meet certain criteria and require specific skills, functional standards set a basis of what standards a student meets and then a team including the admissions committee and disability services work to figure out what standards they can help a student meet with accommodation. This philosophy of focusing on what a student can do, rather than what they cannot helps otherwise qualified individuals enter the field of medicine and helps improve patient outcomes by providing compassion and empathy due to their own experiences with a disability (McKee et al., 2016). In order to portray this ability to aid students, a school's website must reflect how they are willing to accommodate students with disabilities so that students with disabilities are not dissuaded from applying to a school and rather, feel encouraged to do so. Thus, by reforming technical standards to promote inclusivity and transparency as well as increasing the knowledge of medical school employees about protecting students with disabilities, students with disabilities can be better prepared for success in medicine (Eickmeyer et al., 2012; Fitzsimons et al., 2016; Stergioupoulos et al., 2018).

Donlan (2016) suggested the interview, another point in the application process, may pose significant barriers for individuals with disabilities. His qualitative research considered the experiences of six physicians living with a physical disability and their journey with their disability, including the coping strategies they employed, upon entering the medical field. As noted by his participants who had their disability prior to applying to medical school, the interview committee acts as gatekeepers to medical school. Based on their personal experiences, individuals with disabilities may be qualified for medical school, be worthy of an interview and do well in said interview but doubt from the committee due to an individual's visible disability can prevent entry into medical school. Some of these students voiced the concern that it was illegal to not accept them on the basis of their physical disability and committee members told

them that they still wouldn't admit them. This negativity in applying to medical school did not just come from the admissions committee, but from academic advisors as well, suggesting applicants aim for different goals and career paths (Donlan, 2016).

Academic Accommodation

While Canada does not have an equivalent to the Americans with Disabilities Act, Ontario has the AODA (*Accessibility for Ontarians with Disabilities Act 2005*), which was enacted in June 2005, albeit inherently silent on the subject of accommodation. Such laws outline the basis for promoting the inclusivity and diversity of individuals with disabilities, ensuring that their disability is not the sole reason for exclusion from any number of activities, and establish a standard for the implementation of accommodation for students and employees throughout Ontario. That being said, there is nothing in the AODA outlining a specific process for post-secondary accommodations and each school is responsible for doing so on its own (Thomson, 2019). Reasonable accommodation for students with disabilities is a legal requirement of post-secondary educational institutes, including medical schools (Ontario Human Rights Commission, 2002). Along with raising questions concerning fairness, stigmatization and accessibility, academic accommodation for students with disabilities is a legal issue in which universities must provide reasonable accommodation and assistance to students with disabilities as noted by the Ontario Human Rights Commission (2002).

Several issues arise as a result of the academic accommodation process for students with disabilities, and overall, these barriers can negatively affect the education, interactions and self-esteem of any student living with a disability. Often, for students with disabilities, accommodations are not only used just throughout medical school but also in the admissions

process, such as for students writing the medical college admissions test (MCAT). The use of accommodations at this point can potentially impact a student's journey through medical school (Searcy, Down, Hughes, Baldwin & Pigg, 2016). Searcy and colleagues (2015) performed a retrospective cohort study on the association of MCAT scores for individuals receiving extra time versus those receiving standard time with admission, performance in medical school and time to graduation. The authors considered admissions to all medical schools in the U.S. between 2011 and 2013 and in considering graduation rates, they looked at classes matriculating from 2000-2004. The authors found that only 0.3% of applicants used extra time to write the MCAT, but the extra time varied from 25% more time to 100% more time, where most individuals received 50% more time. Using regression models, the authors found that students who used extra time on the MCAT had significantly lower performance rates on the United States Medical Licensing Examination (USMLE) as well as significantly lower 4-year graduation rates. The differences between individuals writing the MCAT with extra time versus those who received standard time suggests that there is a need to better understand the potential barriers to medical education for students with disabilities, from the time of application to graduation and beyond. It is important to recognize that this study only considered one type of accommodation and that it may not account for students with sensory and physical disabilities who may require other accommodations such as larger font size, longer break times, writing the test in a separate room or other accommodations that may have helped them complete the MCAT. Instead, the accommodation of extra time focuses on individuals with learning disabilities and other developmental and neurological disabilities such as ADHD, who would most benefit from this type of accommodation.

In another study, Harrison, Lovett, Keiser and Armstrong (2019) considered the administrative aspect of providing accommodations for osteopathic medical students with learning disabilities. These authors analyzed documentation from 103 accommodations requests submitted to the National Board of Osteopathic Medical Examiners based on learning disabilities between 2013 and 2016. Requests for accommodations require a student to fill in an application form, include up to date diagnostic reports from healthcare providers, provide supportive documentation, letters of support from other individuals and to provide any eligibility for accommodations in other settings. In this study, only 38% of the 103 applicants provided evidence of learning disability symptoms before the age of 18 and 55.6% of individuals had received accommodation before post-secondary education, although often for other reasons such as test anxiety or traumatic injuries. This suggests that a large portion of the applicants had not developed symptoms until their post-secondary education, that they had not been diagnosed yet or that they simply did not show evidence of functional impairments relative to other students. Another reason could be that there was a lack of services to assess these students. Further, the majority of individuals applying for accommodation due to a learning disability did not provide any data suggesting impairment in any relevant academic abilities and in part, this could or could not be explained by any treatments they received for their disability. Along with the fact that only 2.9% of the applicants met the criteria for the diagnosis of a learning disability in overall academic skills, the authors raised specific concerns about accepting the face value of supportive data from students with regards to their disability. Findings suggested that many of the students seeking accommodation do not meet the relevant criteria or even legal standards of disability based on the documentation provided. Thus, it is important to follow official guidelines for diagnostic criteria and to ensure that students meet the guidelines to receive accommodation for

their disabilities. While this may suggest that some students are simply seeking extra time or other accommodations on an exam for their benefit and successfully obtain these accommodations or that clinicians fail to use accepted criteria for diagnosis and try to help all students, tightening the rules could pose additional barriers to those students who do require accommodations and have genuine academic struggles due to a learning disability. Conversely, stricter guidelines could mean that there would be better service, and time provided to fewer students with legitimate needs. There are challenges to providing accommodations and ensuring that only those who truly need them are able to access things like extra time or specific writing requirements, but this is muddled by clinicians not following diagnosis criteria, students lying about symptoms and overuse of the accessibility office.

Attitudinal Barriers and Stigma

Social barriers can be one of the greatest obstacles that medical students with disabilities face. These can occur as a result of the stigma that exists for medical students with disabilities and the negative attitudes of professors and peers (Meeks & Jain, 2018; Stergiopoulous et al., 2018). For many, these barriers continue to persist even when these individuals perform at par with peers on evaluations (Ali et al., 2017) and encounter great success in their respective fields of medicine (Fitzimons, Brookmam, Arnholz, & Baker, 2016). Collectively, these barriers negatively affect the education, interactions and self-esteem of students living with a disability.

Miller, Ross and Cleland (2009) conducted a quantitative study to examine the rates of and attitudes towards students with disabilities at the University of Aberdeen, Scotland, using a cross-sectional survey. All medical students enrolled at the university in 2007 were invited to participate, but only 35% of students responded. Of those who responded, 6% had self-identified

as having a disability, but only 4% had disclosed a disability on admission to the medical school. The questionnaire included the definition of a disability. Upon reading this definition, the percentage of those identifying as having a disability more than doubled to 13%. Thus, the researchers concluded that providing the definition of a disability on application forms for all educational endeavours may lead to more accurate representation of applicants with a disability. In addition, respondents reported that medical school staff, professors and students had negative attitudes towards students with psychological and learning disabilities. Students with disabilities are encouraged to reach out to faculty and to disability personnel, but these statistics can help to explain why many students choose to not reach out. Instead of trust, there is often a fear of retribution and being ostracized by their peers (Stergiopoulos et al., 2016).

Churgay, Smith, Woodard and Wallace (2015) considered the opinions of family medicine department chairs about faculty with disabilities. Their goal was to learn more about family medicine faculties across different universities who have faculty with disabilities, the types of disabilities these individuals lived with, as well as the accommodations they required and the limitations they faced. Using a cross-sectional survey, 41.9% of respondents currently had a faculty member with a disability in their department and most commonly, these were mobility, hearing or psychological disabilities. Of those who responded, 7% of department chairs knew about the disability at the time of hire. While a disability cannot legally be the sole exclusion for hiring someone, it would be interesting to see how the number of faculty members with disabilities changed if more departments knew about the disability at time of hire or if a disability was acquired after hire. Additionally, department chairs who have prior knowledge of an individual's disability might be better able to provide them with the accommodations they require and integrate them into the faculty using advanced planning. With regard to the

accommodations provided to faculty with disabilities, the most common were schedule adjustments, additional time to meet tasks and assistive technology for specific disabilities. For these accommodations, more than one-third of chairs reported no cost for accommodation. On the more expensive end, 25% of respondents noted that costs for accommodations were more than \$5,000. Finally, the authors asked department chairs about the job performance of faculty members with disabilities. While 42.2% of responding department chairs reported that job performance was at par with other faculty members, another 40% found that the performance of faculty with a disability was below the level of their peers. Because no formal evaluation was performed, the reasons for lower levels of performance cannot be deduced, whether these subjective opinions are accurate and what other extenuating circumstances may exist.

The results from Donlan's (2016) study reinforced many of these attitudinal barriers. Using a narrative approach, Donlan interviewed seven physicians with disabilities to learn about their experiences of living with a disability before medical school, during medical school, and throughout their careers as physicians. It is important to note that the small sample size could introduce bias into these results. Participants encountered negative attitudes at each stage in their journey, from discouragement from interviewers and academic advisors prior to entry to medical school, to discriminatory attitudes from clinical preceptors and peers during medical school, and stigma that continued in their careers as they were passed up for new positions or academic appointments. Participants particularly felt that others didn't think they belonged, and this was expressed both implicitly and explicitly. For example, more than one of the participants received failing grades from a clinical preceptor because they had a disability, while others were verbally told that their spot in medical school should have been given to someone else. This is in addition to the cruel behaviours they had to face from their peers in medical school. Some students would

blatantly ignore these students or speak down to them, while others would tell them outright that they had stolen the position of a better-suited student. Not only did the participants experience stigma to their being in medicine, but their abilities were often underestimated, and others would often take over a task they were performing or dismiss their attempts. These individuals were often made to feel like the medical community had lower expectations of them overall, stereotyping them because they had a disability. However, these individuals did not only have negative experiences, because many of them also had support from loved ones, and some even sought support from individuals who had gone through similar experiences. They came up with creative strategies to overcome obstacles and to persevere in their goals to be physicians. These individuals all found success in their practice and knew that their personal experience positively affected patient care, but this was not without further negativity from others in the workplace.

Cook, Griffin, Hayden, Hinson and Raven (2012) examined the outcomes of an initiative tested in two medical schools, University College London and The London School of Medicine and Dentistry, in an attempt to support students with disabilities and health issues through empowerment and to obtain the accommodations to support them. Each of these schools introduced the use of a “student support card”, which was provided to students with disabilities or significant health issues and could be requested by students or tutors. These cards were personalized with an individual’s name, their personal needs due to their disability and suggestions for how they could be helped. The contents of this card were agreed upon by the student and a tutor, and any questions about the card went to the dean of students. Use of these cards made students feel like they had credibility when requesting required accommodations, and a majority of students with the card, including those who had not yet used it, reported reduced stress, anxiety and increased confidence. While the card could be used to obtain specific

accommodations, it also held a symbolic value for students and provided validity to their specific needs. The cards were commonly used in OSCE settings and in ward-based teaching, and there was no evidence that students were overusing the card. Rather, students monitored their use and benefitted from some of the psychological aspects of having the card. This study demonstrated that there are ways to counteract the social barriers that exist for students with disabilities, and that we can provide them with tools to support their education, their lives with a disability, and even their mental health.

Disability curriculum

The disability curriculum teaches students to competently care for patients with disabilities (Symons, McGuigan & Akl, 2009). Disability curriculum is an important aspect of medical education that is, for the most part, lacking, and often, not addressed (Meeks & Jain, 2018; Holder, Waldman & Hood, 2009). Not only does a disability curriculum help medical students learn to care for and empathize with patients with disabilities, but it has been found that when the medical school curriculum has a focus on teaching medical students about disability, it leads to a shift in attitudes that medical students have towards individuals with disabilities (Shakespeare & Kleine, 2013). The way the curriculum is taught is also important. In Meeks and Jain's Lived Experience Project (2018), participants reported that many professors teach about disability in a purely clinical fashion and often ignore the fact that students may be living with the disability about which they are teaching. In failing to teach about other aspects of living with a disability and how to communicate effectively and compassionately with individuals with disabilities, medical students often take on the same clinical perception of disability. Crossley (2015) mentioned that the lack of training of health care providers surrounding disability is a major

barrier to accessing quality health care for these individuals, and others draw attention to the need to better train physicians to interact and care for individuals with disabilities (Long-Bellil et al., 2011).

Many schools have little to no focus on disability curriculum and do not make this a priority in undergraduate medical education or during residency (Holder et al., 2009). According to Holder and colleagues (2009), only 1 in 10 primary care residency programs in the United States have clinical training to teach residents to care for patients with disabilities, and 81% of students' report having no clinical training to care for these individuals. On the other hand, there are medical schools who integrate disability curriculum into all years of undergraduate medical education. For example, New York University, Ohio State University and the University of Buffalo's Jacobs School of Medicine and Biomedical sciences all have a longitudinal disability curriculum. These curricula include lectures on disability history, elective placements in primary care with individuals with disabilities as well as rotations through interdisciplinary clinics and rehabilitation services (Crossley, 2015). By integrating disability curriculum early on in medical education, students are better prepared to be aware of the needs of individuals with disabilities and help them to achieve cultural competency and competency in clinical skills related to caring for patients with disabilities.

Seeing the need for cultural competency and a need for doctors to be more educated and greater prepared to care for patients with disabilities, Woodard, Havercamp, Zwycart and Perkins (2012) developed a specific clerkship module at the University of South Florida's Morgana College of Medicine in 2005. This module focused on patients with disabilities and is still in effect today. Collaborating efforts with medical students, the deans' office and faculty members, the third-year curriculum was changed to create interdisciplinary clerkships that put

emphasis on the site of care in inpatient, surgical, ambulatory and primary care as well as in special populations. Specifically, in primary care and special populations, the developers ensured that there was a focus on longitudinal care. Along with changes to the third-year clerkship, the researchers proposed the inclusion of disability modules that were based on some of the clinical and educational deficits related to care for patients with disabilities. These included classroom sessions with lectures from individuals with disabilities, the use of standardized patients, shared discussions, as well as sensitivity sessions and case scenarios where students could participate in activities and simulations that required students to take the perspective of individuals with different types of disabilities. Other components of this curriculum include community site visits to work with individuals with different disabilities, home visits to learn about the specific experiences of individuals with disabilities and working with students from other health care professions. As a result, this curriculum has led to huge improvements in teaching students about treating individuals with disabilities and provides a comprehensive approach to doing so. Specifically, students who have gone through this module reported greater preparedness in the knowledge, attitudes and comfort of caring for and interacting with patients with disabilities (Woodard et al., 2012).

The Lived Experience Project

The American Association of Medical College's (AAMC) Lived Experience report was released in March 2018 with hopes of broadening the diversity of medical students to include more students with disabilities (Meeks & Jain, 2018). While past AAMC reports have targeted the inclusion of gender, race and ethnicity in medicine, this report focused on the inclusion of students with disabilities, with the goal of ensuring that all those qualified to learn medicine have

the opportunity to do so (AAMC, 2014; AAMC, 2015). The authors hoped to generate discussion and study the lived experiences of participants to learn about the barriers and supports that they have and continue to encounter along their journeys in medicine.

The researchers conducted a grounded theory study and interviewed students, residents and practicing physicians with disabilities from 50 medical schools in the United States. They developed an initial demographics-based online questionnaire to gather information about potential interviewees. They also developed a semi structured interview guide with the goals of learning about the experiences of learners and physicians living with disabilities. In doing so, they used existing literature, as well as questions relevant to different phases of training such as pre-clinical years, clinical years and residency. Following recruitment using email lists, through communications from medical disability service provider offices and through direct email with potential participants, individuals who had completed the initial demographics-based questionnaire were asked to participate in an interview done in-person or over Skype.

The researchers elicited the lived experiences of 47 individuals at different phases in their medical career. While many shared stories of their personal challenges, frustration and resilience, they also shared stories of hope and success. The publication included a section on the supports present in the lives of these individuals, although the main focus was the barriers encountered by medical students, residents and practicing physicians with disabilities. The barriers identified in the Lived Experience Project include but are not limited to structural arrangements in medical environments such as technology, the application process, a lack of knowledge from disability personnel, negative attitudes from professors and peers, and a lack of disability curriculum (Meeks & Jain, 2018). Other factors that hindered the experience of the participants was the lack of clear information regarding academic accommodation policies, the lack of clarity of technical

standards provided from different medical schools and communication issues between the medical school and their disability offices. All of the above prevent individuals with disabilities from participating fully in the field of medicine and may prevent some individuals from applying to and entering the field. In a separate paper, Cohen and colleagues (2002) were shocked by the underrepresentation of healthcare workers with disabilities as diversity in health care professionals leads to an improvement in patient outcomes. Similarly, Meeks and Jain (2018) described that by including individuals with disabilities in undergraduate medical education, there is the potential for benefits to the quality of patient care due to the experiences these medical students have encountered throughout their life as a result of having a disability. Meeks and Jain (2018) found that for all medical students, diversity and inclusion are two factors related to greater self-rated preparedness to care for minority patients. Not only did the authors identify the barriers and supports encountered by students, but they also took the input of current students, residents and physicians to come up with potential solutions for a number of barriers for all medical schools.

Reflexivity

Reflecting on my role in this research, I have never experienced the discrimination that occurs as a result of being a part of a marginalized group. I am a white, cis-gendered, middle class, straight, non-disabled female. That being said, because of acute injury, I have encountered the accommodation process and even in my brief experience, it was a taxing process. I had to contact and meet up with multiple individuals to get the required documentation, deal with the frustrations of communicating across different university departments and manage my injury. I cannot imagine the trials of going through the accommodation process repeatedly and the stress

of deciding whether or not to reveal a disability, particularly in the high-stakes, competitive environment of medical school. I looked forward to learning more about students with disabilities who attend the Northern Ontario School of Medicine. By learning more about medical students with disabilities and working with these individuals, I hope to positively impact the lives of these students, whether it be by challenging the stigma that exists, coming up with solutions to better support these students or to simply provide them with a voice. I hope that this research adds to the current field of work and encourages other Canadian researchers and health care professionals to be more inclusive in educational settings and in the workplace.

In order to maintain this reflexive role, there were several steps that I took to recognize my position and any potential biases that I may have. First, I kept a personal journal to reflect on my thoughts, feelings and questions that arose during my research. Additionally, upon completion of data analysis, I wrote a one-page summary report that was disseminated to participants to ensure that the writing captured their experiences appropriately.

Research Question

Individuals with disabilities face a number of barriers, many of which are unique to an individual's specific disability. The barriers experienced by medical students with disabilities are amplified by negative attitudes from peers and professors as well as the personal stigma they impose on themselves (Meeks & Jain, 2018; Stergiopoulos et al., 2018; Henderson et al., 2012). In Ontario, medical schools are dedicated to including and integrating students with disabilities (Council of Ontario Faculties of Medicine, 2016). As we move forward in including individuals with disabilities in medicine, there is a need to examine the ways that students with disabilities may be excluded and the individual barriers they may face in order to remove said barriers and

improve the overall experience of medical students with disabilities. These barriers may occur at many points in an individual's medical school journey and begin as early as the application process and continue well into an individual's career as a physician. The application process can present several obstacles for prospective students who live with disabilities, as technical standards posted by institutions are potentially unclear and difficult to find, and the interview process can be disheartening for students who interact with admissions staff that discriminate against their disability (Zazove et al., 2016; Donlan, 2016). Institutions must take measures to provide support to students with disabilities to provide equal opportunity and participation (Stergiopoulos et al., 2018). Accommodations are not an advantage that students with disabilities receive. Rather, accommodations are intended to provide equal opportunity for students with disabilities to demonstrate their skills and knowledge. As demonstrated, this is the result that we see when accommodations are provided to students with disabilities (Asghar et al., 2018; Teherani & Papadakis, 2013; Ricketts et al., 2010). Unfortunately, even when students with disabilities are performing provided equal opportunity to their peers as a result of accommodations, these students are graduating at lower levels than students without disabilities, at least in the U.S. (Teherani & Papadakis, 2013). Thus, it will be valuable to understand how we can better support students throughout their medical school journey as a whole and not just through individual assessments.

The Lived Experience project presented an opportunity for researchers to better understand the barriers and supports encountered by medical students, residents and physicians living in the U.S. (Meeks & Jain, 2018). The authors examined each step in the medical school journey and through medical practice to examine where and how barriers occur, how individuals with disabilities felt and suggested how things can change to remove these barriers. As predicted,

the authors found that barriers arise throughout the medical school journey and include but are not limited to structural arrangements in medical environments, the application process, a lack of knowledge from disability personnel, negative attitudes from professors and peers, and a lack of disability curriculum. They presented potential solutions to mitigate or eliminate these barriers from the lives of medical students, residents and physicians living with a disability. The Lived Experience Project provides a unique opportunity to learn about, and compare the experiences of, participants in this study to medical students at one medical school in Northern Ontario, the Northern Ontario School of Medicine (Meeks & Jain, 2018).

In response to the Meeks and Jain (2018) publication, the goal of this research was to partially replicate this study with the research question “What are the barriers encountered by undergraduate medical students with self-identified disabilities at the Northern Ontario School of Medicine?” In doing so, this research explored the climate and culture at NOSM and how this affected the treatment and education of students with disabilities, including the barriers they faced in the academic accommodation process, in medical environments and throughout medical school as a whole. The goal was to provide a voice to the participants, medical students with disabilities, and moving forward, to come up with solutions to reduce or remove the barriers they are experiencing.

Theoretical Framework

Describing the Social Ecological Model. The social ecological model assumes that any one level of influence does not account for all of a person’s health or behaviour and highlights the interdependence and interrelationships between individuals and their environments (Bronfenbrenner, 1979). A focus on environmental levels is what distinguishes ecological

models from behaviour models, as ecological models are much broader in their considerations compared to focusing on individual behaviours (Sallis et al., 2008). Levels of influence in the ecological model can be considered like a set of nesting dolls, each level or ecosystem nested inside the next (Bronfenbrenner, 1979). Ecosystems provide the greatest influence in lifestyle and health (Bronfenbrenner, 1979). An individual's environment includes a macrosystem, exosystem, mesosystem and microsystem. From macrosystems to microsystems, the specific levels include policy, organizations, communities, institutions, interpersonal groups and the individual. Application of ecological models allow for the examination of influences at each of these levels. Grzywacz and Fuqua (2000 p.102) state that, "the ecological perspective calls for an interdependent, multidimensional, multilevel, interactional view of the etiology of individual or community health". There is interdependence and reciprocity between different environmental levels when applying ecological perspectives (McLaren & Hawe, 2005). Sallis and colleagues (1998) note that influences at higher levels such as in policy or organizations can provide insight to the influences occurring at interpersonal and intrapersonal levels.

Applying the Social Ecological Model. Understanding the barriers faced by medical students with disabilities is a complex problem and barriers occur at different levels of the environment. Collectively, these barriers negatively affect the education, interactions and self-esteem of students living with a disability. This occurs as a result of the stigma that exists for medical students with disabilities and the negative attitudes of professors and peers that exists in medical school (Meeks & Jain, 2018; Stergiopoulous et al., 2018). Overall, these impede the academic accommodation process, preventing students from receiving the assistance they require to succeed (Fitzimons et al., 2016). Before we can enact change in the lives of individual students

with disabilities, it will be helpful to understand the barriers that they face. For example, the AAMC or the Council of Ontario Faculties of Medicine can set out guidelines that schools must meet to include students with disabilities and facilitate the academic accommodation process. These could include reforming technical standards to promote inclusivity and transparency as well as increasing the knowledge of medical school employees about protecting students with disabilities (Eickmeyer et al., 2012; Fitzsimons et al., 2016; Stergioupoulos et al., 2018).

McLeroy and colleagues (1988) specify the organizational level to be an important level for focus because support from stakeholders must be obtained at this level to further implement different programs at institutions and for individual groups. Barriers at one level may overlap with barriers from another, highlighting the interrelationships and interconnectedness of levels (Keating et al., 2008). The fact that the barriers for medical students with disabilities are systematic and diverse, endorses use of a social ecological model as a framework to identify what these barriers are, what levels of the environment impact students most and how these barriers affect the education and individual lives of students. Use of the social ecological model is further supported by the many applications of ecological models to topics in health and disability (Richard, Gauvin & Rain, 2011; Curry-Sontag, 1996). These applications support use of the model for this research question as they demonstrate favourable and successful use of the model under similar context.

Method

Participants

Participants included in this research were current undergraduate medical students at NOSM during the 2019-2020 school year with a diagnosed and self-identified disability.

Participants were included regardless of whether this disability was disclosed to the medical school. Exclusion criteria were any students without a self-identified disability such as able-bodied individuals, medical residents, and any non-medical learners including nursing students or other university students. Participants of all genders were included in this research.

The participants of this research included three self-identified females and one male. The pseudonyms chosen by the participants to be used for the study were Natalie, Katie, Penelope, and Daniel. None of the participants were born with their disability and the average age of diagnosis was 16.5 years. All of the participants had lived with their disability before beginning medical school.

The disabilities of participants varied. Three of the participants have a sensory disability, a physical disability, and permanent disability, respectively. The fourth participant has a disability that has affected them for over a year and had the potential to be affected permanently.

Natalie, Katie, and Penelope formally disclosed their disability to the medical school, while Daniel informally disclosed their disability to their professors, preceptors, and peers. In discussing accommodations, the three participants who formally disclosed their disability have obtained accommodations during medical school, and Natalie and Katie also used accommodations in high school and during their undergraduate degree. Daniel, who informally disclosed his disability, did not use any formal accommodations during his time in medical school, though he did have some informal accommodations to enhance learning environments,

particularly in clinical settings, where he reached out to preceptors and spoke to them without going through the medical school. Consequently, there is not as much from Daniel in the results and discussion section of the paper, as he often did not have answers to the questions asked or was very brief in providing such answers.

Study Design

Although the study that was being replicated used grounded theory (Meeks & Jain, 2018), the goal of the current study was not to develop theory. Instead, it was hoped that the results of this research would add to the current body of work, to learn more about the lives of medical students with disabilities at the Northern Ontario School of Medicine and compare this to the experiences presented in Meeks and Jain's 2018 Lived Experience Project. Thus, rather than use grounded theory, the chosen study design was a qualitative descriptive design as described by Bradshaw, Atkinson, and Doody (2017). Using a qualitative descriptive design provided the opportunity to understand and learn about the barriers encountered by undergraduate medical students living with disabilities at the Northern Ontario School of Medicine.

Qualitative descriptive study designs are inductive and exploratory (Bradshaw, Atkinson & Doody, 2017). It is a straightforward study design that is used to understand and describe phenomena or events. Its use is especially beneficial for research requiring information from individuals who have experienced the phenomena or events that are being investigated (Neergard, Olesen, Andersen & Sondergaard, 2009). Qualitative descriptive study designs provide an emic stance, where an outsider seeks to learn from insiders—individuals who are part of the group being studied (Bradshaw et al., 2017). The primary researcher in this study was the

outsider seeking to learn from the medical students living with disabilities. This type of study design uses data collection in the natural settings of the individuals being studied and often uses thematic analysis, which will be further described below. The final result of a qualitative descriptive study is a rich description of the events, or the phenomena being studied. The benefits of using this study design include that it is straight-forward with no manipulation of variables and that it is flexible with a variety of techniques that can be used for sampling, data collection, and analysis. While this study design is subjective and a researcher may impose their stance in the research and writing process, the design generally recognizes this subjectivity and attempts to account for it (Bradshaw et al., 2017). Other challenges include the fact that qualitative descriptive research often overlaps or is confused with other study designs such as cross-sectional studies or narratives. Additionally, there are ethical issues concerning the confidentiality and anonymity of participants. In particular, this may be problematic for students with disabilities that are visible to others or may be the only one with a particular disability.

Procedure

Expedited research ethics applications were submitted to the two host universities of the medical school and ethical approval was obtained from both institutions for the research at hand (See Appendix A).

Recruitment. Purposive sampling was used to recruit undergraduate medical students with disabilities at the Northern Ontario School of Medicine (NOSM) as participants for this research. Potential participants were contacted via email, by way of NOSM's Learner Affairs newsletter, to gauge their interest in participating in the project. The Learner Affairs' Newsletter is a letter sent out weekly by NOSM's Learner Affairs Office and the letter of information for this research

project was an item that was included along with a copy of the recruitment poster. This email is one that is sent to all medical students at NOSM. Posters, as seen in Appendix B, included information about the research, the researcher, inclusion criteria, who to contact, and the incentive to be provided. This method of recruitment generated a very small response rate, and a second attempt was made to recruit more students. Students were emailed by Learner Affairs Officers with details of the research. Students were also recruited via posters shared via social media, namely through a Facebook page for NOSM students and through general Facebook posts shared by peers. The Students' Council at NOSM was also consulted to find out the best ways to reach students and hoped that students found out about this research by word of mouth. Students interested in participating in this research then contacted the primary researcher, by e-mail.

Upon recruitment, participants received an information letter (Appendix C) and were asked to sign a consent form highlighting the fact that the information they provided was confidential and their identities would not be revealed. Individual demographic information of participants such as e-mails, birthdays, and ethnicities were carefully protected because the medical school is a small community, and the above information could easily disclose an individual's identity in addition to the possibility that their disability may be linked back to them. After agreeing on a set date and time at the participant's earliest convenience, semi-structured interviews were conducted with participants. Before conducting the interview, verbal consent was obtained from participants to have in addition to the written consent obtained by e-mail. Interviews lasted between 30 minutes and an hour and 30 minutes, with the opportunity to follow up should the participant feel it needed. To maintain credibility and maintain accountability to research participants, member checks were performed following interviews to ensure prolonged engagement, and a summary of results was provided to all participants.

Setting. Qualitative descriptive researchers collect data from participants in the natural setting of the phenomena taking place (Pope et al., 2002). This study took place for participants on their own time during the academic year at the Northern Ontario School of Medicine. Due to NOSM's distributed centered learning model, students are often geographically dispersed with clinical placements, rotations, or clerkship throughout Northern Ontario. Thus, interviews were completed at a distance by phone if chosen by students.

Data Collection. Initial data collection began with an initial survey using Google Forms. This survey was also used to establish whether the interview was done in person, by telephone or via Skype (a video calling service). It was used to ask questions about the participants' demographics, education history, and general questions about their disability (e.g., type, age of onset, use of academic accommodations). Participants were asked for their preferred pseudonym to be used for the semi-structured interview, as well as for the results and discussion. This survey can be found in Appendix D. Upon receiving demographic information, e-mails, birthdays, and ethnicities were de-linked from other demographics by being put into a separate, password-protected file with participants' ID numbers and pseudonyms. A semi-structured interview was then conducted with participants. The interview questions and probes for the semi-structured interview were adapted with permission from the interview used by Meeks and Jain (2018) for the Lived Experience Project via personal communication with the authors. This interview guide included opening questions, questions about life as a medical student, and questions about the medical school experience with a disability. Both the initial survey and the semi-structured interview included sensitive topics and it was necessary to proceed in a compassionate, caring manner to ensure the participant felt comfortable.

Data Analysis. Data were analyzed using Braun and Clarke's (2013) thematic analysis using their six-phase model. Using themes and patterns identified from the coded data, the student researcher made sense of the collective and shared meanings of the experience of being an undergraduate medical student with a disability at NOSM. According to Braun and Clarke (2013), thematic analysis is both flexible and accessible. Its flexibility permits reliance on a variety of theoretical frameworks, and analysis may be conducted in many ways. Thematic analysis is approachable because it teaches the basics of coding and analyzing data, while also making results more accessible to a greater range of readers (Braun & Clarke, 2013).

The interviews were recorded and subsequently transcribed verbatim by a student researcher. Once all of the interviews were transcribed, the data analysis process began using Braun and Clarke's (2013) thematic analysis using the following steps. Initially, the student researcher familiarized herself with the transcripts by reading over them and taking notes about topics of interest. Next, codes were generated from the data to label specific features and to aid in the search and development of themes. Eventually, all coded data was organized under different themes, creating meaningful patterns. These themes were used to write a written report summarizing the findings.

Limitations and Validations

Limitations. There are several potential sources of bias for this research. Selection bias is possible due to the small sample population and challenges throughout the recruitment process. Non-response bias may have also occurred due to the students' fear of revealing undisclosed disabilities and possible consequences that could have arisen as a result or simply because they may have been to feel they could devote the time required. Similarly, membership bias may

prevent the participation of medical students with disabilities as they are a stigmatized minority in medicine (Stergiopolous et al., 2018). Finally, there is the potential for researcher bias and the student researcher's influence on the current study. In part, this was mitigated by maintaining a reflexive process throughout the data collection, writing, and revision stages and also by receiving feedback from committee members.

Validations. To increase dependability and transparency, the research design and methods (including sampling, data collection, and data analysis) were rigorously described to allow for replication of this research. To ensure trustworthiness in the research, a reflexive journal about the research process was kept about expectations, findings, as well as feelings of the researcher. This was done to limit the influence of researcher bias, one of the limitations of qualitative descriptive research. Aims to increase systematicity included incorporating theory into this research and the Social Ecological Model was used (Bronfenbrenner, 1979). Additionally, this research is strengthened by its rationale, namely that there is little research that has been done on the experiences of Canadian medical students with disabilities as well as its connection to the Lived Experience Project (Meeks & Jain, 2018) to inform its methods.

Results

Through semi-structured interviews, participants described their experiences of living with their respective disabilities, their undergraduate medical education, and how the two overlap. The main focus of the interviews was to discuss the barriers encountered by the participants as a result of their disabilities and how these barriers differ between disabilities, learning environments, and as individuals. After transcribing and coding the interview transcripts, several themes emerged. These themes can be grouped into barriers directly associated with medical education, barriers indirectly associated with medical education, and other major themes such as how their disability impacted their journey in medicine and barriers outside of medical school. Barriers directly associated with medical education included foreseeing barriers in the future of their journey in medicine, barriers to the application and interview process, academic barriers, clinical placement barriers, barriers to the accommodation process, communication barriers, and a lack of knowledge from professors, disability personnel and preceptors. Barriers indirectly associated with medical education include invisible disabilities and social barriers. These themes arose following an analysis of interviews using similarities and repetition of ideas found in transcriptions. Consistent with a social ecological approach, barriers were identified in different ecosystems nested within each other. For example, barriers were identified from policy at the national level (dictating who can apply to medical school) to the admissions process, and more intimately, personal and professional relationships with professors and peers; barriers occurred from the outer macrosystems to the microsystems.

Barriers directly associated with medical education

Foreseeing barriers in medicine. From the interview process to clinical placements and working as a physician in the future, the participants foresaw barriers arising before they even experienced them. This created stress and anxiety, but also allowed them to be proactive and think of solutions ahead of time, to communicate with professors and preceptors, and contact Learner Affairs to jumpstart the accommodation process. The Learners Affairs Office is a resource to students that supports student wellness and for students with disabilities, is the first point of contact, as each student is assigned a Learner Affairs Officer.

In addition to reaching out to Learner Affairs during the last year of her bachelor's degree, Natalie knew she was going to encounter barriers as soon as she found out that she had been invited for an interview at NOSM:

January of 2017, that's when I- I got my invitation for an interview. And then...knowing the style of the interview, with the whole MMI and the scenarios on the door, I was like 'Ok, this is... I already like, I was able to foresee that there was going to be barriers there'. So, I reached out to [Learner Affairs] and I said 'listen, I got an interview, Umm, I... Considering my visual disability, I think, I'd like to see if there's a possibility to be accommodated for the interview process?

Ultimately, she also foresaw barriers in the future, after completing medical school, knowing that she would continue to encounter them, saying "... There was also the fact in the back of my mind like how am I going to do my licensing exam. You know, like are they going to accommodate me like this?"

The participants also knew that as a result of their disabilities that they would likely need to consider what specialties would or would not be possible for them in the future. Katie said that she needed to

[Make sure] I choose a specialty or choose uh, ya, I've already started to plan what specialties I can and can't do. I know I can't be a surgeon. I cannot, like, be in a position where I have to be standing for 17-18 hours. I can't do that physically. So, I've already narrowed out different specialties that I'm not able to do based on my physical, um, disability...

For each Participant, this differed as a result of the unique challenges they encountered as a result of their disability as well as their personal interests but allowed them to put their focus into what they were able to do and how they would succeed. Since the participants only covered a small range of disabilities, these cannot be generalized to all disabilities.

Barriers to the application and interview process. The medical school application and subsequently, the admission interview are the first two steps in a prospective medical student's journey. These processes involve a lot of time and preparation and are two of the deciding factors for medical school acceptances. For applicants with disabilities, there may be additional barriers that prevent them from displaying their best selves or from doing so without accommodations. Natalie spoke to this:

I ended up meeting with [Learner Affairs], uhm, during my fourth year of my undergrad, so before I actually submitted my application, just to kind of explain to them my situation, and see... Is this, is medical school something that's actually feasible for me? And the discussion went well, I mean, I left there feeling hopeful.

She went on to explain the benefits of having the application process online because she was able to use assistive technology and made it more manageable to complete the process. That being said, she found that the requirements and accessibility policies by the different governing bodies for medical students, such as the Committee on Accreditation of Canadian Medical Schools (CACMS), “were still kind of vague”, especially when it comes to students with disabilities. As for the interview, she foresaw barriers in the interview process and reached out to the medical school ahead of time, securing accommodations to ensure the process went smoothly. Learner Affairs was supportive of these accommodations and having these in place allowed her to interview to her best abilities.

Many medical schools in Canada have a supplemental application for students to explain why they may not have been as successful in one year of their undergraduate education or if their GPA is lower than expected. The Northern Ontario School of Medicine does not have this. Katie explained that this was a barrier saying:

...One of the barriers I found in terms of the application process, was that when I applied to [another medical school] they had a separate, like, essay or application you could write as a supplemental to attach to explain why at any point in your transcript you have like low grades or like, like you had to take a year off. Or like you could explain that to them in an essay. So, if it was because you got pregnant or like you had to take time off for mental health reasons or because you had a disability. So, for me, I thought that was a barrier to the admissions process because applying to NOSM, I have, I have in my class, one of the lowest GPA's that- for getting in.

Katie also spoke to the fact that the admission requirements for all medical schools may be a barrier for students with disabilities, saying that:

Even in terms of the admission process, to apply to most medical schools in Canada including NOSM, you have to have had full years of study... From my understanding – I couldn't have been like a part-time student, which most of my friends with disabilities are part-time students. It may take them 6 or 7 years to finish an undergrad than four, than an able-bodied person, but I forced myself to do full course load to finish in four years because I knew I wanted to go into medicine.

She wishes that there was a way for students with disabilities to be able to apply to medical school while taking a lightened course load in their four years of undergrad, feeling like this would have helped her to prioritize both her health and her grades.

While Penelope only developed her disability after the application and interview processes, she admitted that the process would have been nearly impossible if she had been experiencing the symptoms of her disability:

If I had had it before, I would not have been able to do the process, like at all... I can just see– like right now, I would not do well. Like I would not have gotten in. Like I don't even think that – like I don't know how they would have accommodated, because the noise, just the people, the reading, the answering, something intellectually. If I'm like speaking intellectually for longer than like 15 minutes, I have a really severe headache, so I wouldn't really be able to do it now. But also, that's - I didn't ask them to do it. So, I'm sure they could do some form of accommodations, but I can't really speak to that aspect of it.

The admissions process can pose several barriers for students with a range of disabilities. These barriers can arise at a number of steps in the process, and the barriers that arise can be

unique to the student's disability or potentially to all students with disabilities, such as the requirements for admission set out by the Committee on Accreditation of Canadian Medical Schools (CACMS). As a result, the admission process can be significantly more challenging for students with disabilities in comparison to their able-bodied peers, potentially preventing the acceptance of some qualified and high-caliber students to medical school because they live with a disability.

Academic Barriers. Academics are a huge component of medical education. This includes academic sessions such as lectures, small group sessions, laboratory sessions, and assessments. Barriers to these aspects of medical education can ultimately delineate an individual's journey in medicine and cause immense amounts of stress. For three of the four participants, they were faced with unique academic challenges as a result of the symptoms and characteristics of their disability.

Medicine is a very competitive and demanding field, and the participants found that this was compounded by the struggles they faced as a result of their disabilities. For example, this could have meant having to learn content in alternative ways or coming up with methods of learning that worked for them and their respective disabilities. As Natalie put it:

Like it or not, medicine is very demanding, and it's very visual. And, you know, especially when you're learning your anatomy and people are like well, just look at this textbook, and I'm like 'Ya I wish I could, but'... You know, but I have to learn it in a different way, and I think that was one thing that was really difficult is that you're sort of expected to l-learn, like... You're sort of expected to learn in a certain way.

For these individuals, there weren't necessarily resources that they could access for the method of learning that worked best for them, which ultimately meant they had to figure out their own

creative ways to learn academic content or they just didn't do as well in certain types of assessments.

Even attendance to academic sessions was a barrier due to the nature of the many mandatory sessions and the fact that they also had to care for themselves and the needs of their disabilities. The participants often had appointments with specialists taking them away from campus or symptoms that were aggravated by the nature of different academic sessions, which led to them to have to make decisions about whether they were going to succeed in medical school or if they were going to take care of their mental and physical wellness. Katie spoke to this, saying:

...We have to be present in class every single day in different sessions, in person, sitting for long periods of time, like hours – 6, 7, 8 hours. Today, I think I sat for like – I had a three-hour lecture in the morning, then we had an hour break, and then we had another four hours. So, I was probably sitting for 7 and a half hours today, not being able to move or leave. So that has a huge barrier to students with disabilities like me who I can't sit still because it aggravates my condition... because of that, it's mandatory attendance, so if I'm not in my classes all the time, I don't get the participation marks, I can get professionalism complaints, or I won't be able to pass the module if I'm not present. Uhm, so that was a huge barrier in first year, going – adjusting to the regimented school schedule.

This not only affects individuals with physical disabilities but those with a neurological or sensory disability, as experienced by Penelope, leading to exhaustion and affecting her ability to function. She mentioned that:

I mean, I didn't go to lectures because I couldn't. Like I tried to the first module and then I stopped because the noise and the people and I couldn't even... Like coming home and being that exhausted, I couldn't even follow my father's conversation of like 'How was your day?' Because I was so drained that I couldn't comprehend what he was saying.

Clinical placement barriers. Clinical placements are another important aspect of the medical school curriculum that begin in the first year and presented barriers for the participants. In their first year, medical students at NOSM complete a 4-week integrated community experience in an Indigenous community, followed by two rural placements in their second year and the 8-month comprehensive community clerkship in third year. The fourth year is composed primarily of rotations through different specialties, taking students to different communities, settings and exposing them to a range of practices.

While Natalie was able to have accommodations in place to have a fellow classmate support her through her placement, Katie faced pushback for asking for the same type of accommodation. This ultimately led to her choosing not to ask for accommodations in future placements for fear of "poking the bear". She said:

I just felt like I was being judged, asking for help... [Learner Affairs] said something along those lines like 'the accommodations committee would like to see some improvements from you, in terms of needing this support moving forward.' And I didn't think much of it. I was like 'Okay.....' AKA, they said, they were like 'You can have your supports for first year, but you better not need a support for the next three placements, including CCC, which is 8 months. So, after I had that conversation with [Learner Affairs], I was so scared to get accommodations moving forward that I, uh, I did

end up submitting for 108 and then I got the same warning and they said ‘ you better not...’ – they agreed to it, mostly just to be near Thunder Bay and nobody had the placement I had in the first option, but then I got warned again saying ‘You better not – or you need to work on doing better’ I guess. ... ‘You gotta get your disability under control moving forward, you don’t need to have your friends around.’ Like Okay? Cause it was along the lines of like I’m gonna be an independent physician soon and I’m not gonna be able to have friends.

Certain learning components of clinical placements led to barriers for the participants and these were most often associated with the characteristics of their respective disabilities. This meant informing preceptors of their disabilities and discussing accommodations for these sessions that would support the student as well as their meeting clinical requirements. Natalie discussed her rural placement, which was relocated to Sudbury in order to troubleshoot any challenges noting that even then, it was:

...The toughest thing I’ve ever done. Um, barrier after barrier after barrier from not being able to read her EMR, um, not being able to do blood pressures, not being able to do proper inspections, and physical examinations, and just always feeling like ... Like... Sort of judged by the patients...

Similarly, Katie encountered physical challenges during her integrated community placement in an Indigenous community. These occurred in part as a result of the changing schedule during the placement and in part because of the lack of communication between her school and the community and she felt like her disability was “a card that had to be played”. She explained:

...One day, my friend and I would go to the woods with an elder, like walking around in

the forest for like 12 hours and then, uhm, you know, someone in an able body, that's fine, but for me, like, if I had known I was gonna walk in a forest for 12 hours, I would have doubled up on my medication or taken medication for my pain, but I didn't... It was very difficult, um, in terms of like that, didn't really feel supported. I remember I reached out, I reached out to the NOSM coordinator about two weeks into my placement about how exhausted I was and how the schedule was really intense, and I needed some days off. I didn't know how to approach it in the Indigenous communities; I didn't want to offend them and was not very well supported. I kind of got the response saying like 'Well you just kind of have to deal with it, that's what they do in Indigenous communities.' But then I ended up, I told her 'like, you know, I have – I have accommodations like I'm a registered SAS student'... And I felt like it was a card I had to play, which I just feel wasn't even needed, but I had to say that because I was in this situation where I felt like I was uncomfortable – like seriously struggling. And like, even after I said that she said 'Oh, I didn't know that! Like I... Someone usually would have told me.' But nothing was done still. Like nothing, like she's like 'We'll see if we can do anything.' And nothing ended up happening. My friend and I ended up trying to, went to try and advocate to our coordinator and still, nothing was happening. We just were judged about like complaining that it was too much work and we were seen as people who just wanted to study all the time, when in reality, I literally just wanted to be able to rest and have a rest day, right?

Barriers to the accommodation process. For the three participants who had sought accommodations, the accommodations process presented several different barriers, some of which were common to all three individuals and some of which were unique to their respective

requested accommodations.

Natalie and Penelope both felt like accommodations and solutions had to come from themselves, without them really knowing what they could obtain or what kind of barriers they would encounter. Natalie described it as:

They didn't know what to do and the thing is, I, I feel like they were expecting a lot of solutions to come from me, and I tried my best... But the thing is, like, this is my first time in a clinical setting. Like. (laughing) Like I said, my vision fluctuates. Like depending on the lighting, like depending even on the weather outside, like... It's hard to...to accommodate when we, when I don't know what I am getting into.

Natalie and Penelope also felt like the school wasn't prepared to deal with the barriers ahead of time and they would just deal with them as they came up. Natalie noted that the school was open about the fact that they weren't sure how they would accommodate certain aspects of a student's medical education. Ultimately, she felt like the school was pressuring her to leave because they didn't know how to accommodate her disability.

On the other hand, Katie felt like she wouldn't have gotten the accommodations or changes to accommodations that she needed if she didn't self-advocate and push for change as much as she had. In exam situations, she explained that:

...I told them, I was like I haven't written even one exam yet, how do I know, like, this is a new exam-taking environment for me. Is it ok if I have a baseline of accommodations for this exam and then after the first one, I come back and debrief with you guys to let

you know what worked, what didn't work, and we can adjust my accommodations as needed...? And they were like shocked. (laughing).

Participants also were not informed of some of the accommodations they could have access to as students with their respective functional limitations, and even when they received these, they continued to face barriers. For Katie, it took almost a year for her to find out about and gain access to recorded lectures, and even then, she said

There's been many, many, many, many tech glitches... But there's always like 6 or 7 or 8 lectures that are not recorded for some reason, but even if I am away- like I had to go away for treatment so I was like trying to watch the lectures and all of a sudden, they are not there. And I contacted IT and I'm like 'Hi like I'm a registered SAS student with NOSM, I'm trying to access these lectures...' and I get an email and I go ping-pong back and forth with IT for like 3 days and then they say, 'oh sorry there was a glitch, and the lecture wasn't recorded.' That's happened multiple, multiple times and I know that's not just affecting me but affecting other students.

When it came to writing exams, Natalie explained the different types of accommodations she had had in place to support her and the fact that nothing ever really worked. She said, "I swear, every exam I did in my first year was done a different way because it was just troubleshooting." This was frustrating and ultimately prevented her from being as successful as she could have been. Accommodations for her Objective Structured Clinical Examination's (OSCE's) were also treated differently. She had asked to have accommodations similar to those she received for the interview process to be accepted to NOSM, and these were rejected. Instead, they printed the sheets with questions in bigger font and she was told this was the best they could

do because anything else would not be fair to other students. As a result, her OSCE did not go well and she explained:

So, when it was my turn like I couldn't even read the page. And I was like 'what am I gonna do'. Like I was panicking. And then one—one of my like colleagues in my group, was like 'Are you ok?' I was like 'I can't read the page'. So, she briefly rhymed off some words so that I had an idea of what I had to go in there and do. But like leaving that situation made me feel so defeated.

To her, it wasn't a matter of the situation being fair to all students, but as a student with a disability, she said that:

I'll never be at everyone else's level, so this isn't about equality, it's about equity and it, just, that made me so frustrated. And I even like threw out different like – I was like why can't we do an audio recording and I can like listen to it briefly before going in or the iPad inversion and it seemed like there was issues on like 'well you can't go in there with an iPad' and I was like, 'Listen, when I did my interview circuit, it was said 'you're gonna have an interview in your circuit that comes in with an iPad'. Like what's the big deal? Like really, if people have an issue with that, that's discrimination...

Speaking of fairness, participants felt that accommodations for students with disabilities weren't necessarily fair. Penelope knew someone who was struggling with the same disability and symptoms as she was and was frustrated by the fact that she wasn't offered some of the same accommodations. She recognized that every person in a different situation has different struggles and limitations, but she didn't understand why the accommodation committee pushed back on accommodation requests that she asked about when another student was already receiving it. She

explained:

– Another person [with the same disability] in my class, that had one a little sooner through the school year than mine, [student accessibility services] like offered her like, did you want a paper copy, did you want this, did you want that? And I didn't really get that... But then – I had to fight for a paper copy because my note specifically said, 'This person cannot be on a computer for longer than 20 minutes.' But my exam was three hours. So.... but they still wouldn't give it to me, but I was like I CAN'T be on a computer. Like I can't do that, and so I had to fight, fight, fight. And finally, they gave me a paper copy, but I had to transfer my answers from my paper to my computer... But my biggest problem is my eye tracking, so 50-70% of all my pain is from my eye movement, and like my eye sensitivity, so it took me forty minutes to transfer... Like that's forty minutes that I could have been reviewing my answers, that's forty minutes that I could have made a mistake transferring the answers to the computer because I was so tired, that I just wanted to get out of there, right?

Even once she received the paper copy of the exam, she didn't feel like she was fully accommodated because her accommodated exam was written with all other students from Laurentian University who were writing exams with accommodations. Again, the classmate that had the same disability was not in this same room and received different accommodations. She showed up to her exam and said:

People that have accommodations can be people that have the same disability as me or it could be people with anxiety, with depression, with you name it. But typically, people with anxiety, they're moving their legs or like, like moving around, they're making noise,

so you know what I mean? Like if I'm, like the whole point of why I wanted accommodations is because I can't deal with visual stimuli and auditory stimuli.

In this situation, it is important to note that accommodations are proposed by the assessing health care professional. Thus, two individuals may visit two different health care professionals that suggest different accommodations for the same disability. On that same note, one person may visit two different health care professionals that suggest vastly different accommodations. This may be affected by the attitude of the health care professional, their experience with the disability and even their knowledge of what accommodations may be available. As such, how do we ensure that there is equity in the accommodations being accessed by different students visiting different health care professionals?

How accommodating is NOSM? Daniel and Penelope acknowledged that NOSM does its best to accommodate students with disabilities. Natalie had a different perspective and she feels like she could have been better accommodated in several ways, including lab sessions and her clinical placements. After doing her own research on how students with disabilities similar to hers were being accommodated in the U.S. and internationally, she felt like there wasn't enough being done to try and accommodate her. She said that "the thing that frustrates me is that I know, in the states, there are physicians who are visually impaired... some that are born blind and enter the profession". She mentioned that she thought "the school had good intentions, but they didn't really wrap their minds around what it would mean for a student with a visual disability to go through their program." While the school may have been prepared to have a student with a physical disability or had had a student who was in a wheelchair, she felt like they were not necessarily prepared to take someone with her disability. This could also be affected by Canadian policies on academic accommodations. In follow up, she said that

Maybe Canada needs to reflect on what they're doing if it's being done elsewhere. So obviously they don't have that sort of visual test like fine... If that's not the route you want to go in Canada, then be prepared to help the students who get in who are visually impaired.

A lack of knowledge from professors, disability personnel, and preceptors. One of the struggles for participants was that they felt that staff at the medical school including preceptors, disability personnel, and professors, didn't necessarily understand the extent of a student's disability or even know about that disability. This was an isolating experience for the participants as entering the field of medicine can be quite intimidating, compounded by the fact that medical instructors may not know specifics about a certain condition or its severity. Part of this had to do with the fact that faculty and staff were not always made aware of the student's disability if not needed due to privacy and confidentiality. It also had to do with the fact that although being taught by medical professionals, if they had not been trained in the specific area of the disability, knowledge on specific, rare disabilities were not necessarily known to them. This came up for Natalie when she would try and share her information about her rare condition with others:

And then even sometimes, like, when I would tell people about my, my condition, like especially like my preceptors, and stuff, they're like 'oh, I've never heard of that'. So it kind of like (laughing), it also makes you worried in that sense where like, ok.... Like, I know my condition is rare... and when it's like the medical profession isn't really aware of it, it's harder to find your place in it...

Similarly, Penelope encountered situations like this as well and especially felt like her disability wasn't understood because it was invisible:

... I think it's the nature of my disability that, that you can't physically put a number on, like you can't visually see it. And so, even like health care professionals that are trained and have a specialty in brain injuries. They have a difficult time figuring out what's wrong with you, and so I don't blame them for not knowing, but it's also – if you don't know something, you should like learn it, because it could help your students in the long run, if that makes any sense.

She thinks that this can be improved in the future by teaching medical students about disabilities and welcoming people from the community to share their experiences with disabilities that are not well understood. She notes that something that would have positively impacted her medical education is:

If my disability would have been explained, or would have been taught in the curriculum, um, because it's not... And so like, I really do see the benefit of actually learning about concussions and learning about, how it's so vast and how it's different for everybody. And I understand that it's really hard to like to teach someone when it's not really understood from the professionals themselves... But if you can- but I think that NOSM should bring in those people with said disabilities, that is difficult to understand and maybe just talk to someone about it. Like even ask people within the class if they have it, if they would like to talk about it. And kind of like try to understand because there's no way that they understand what I'm going through because I'm not going to tell people if they don't ask.

One of the participants was also presented with financial barriers as a result of a lack of knowledge from administrative personnel. As medical students, the participants had already taken on the fact that they would be taking on some amount of debt, but this was heightened for

Penelope because she missed out on the opportunities for scholarships and grants because she deferred her year one day too early and the individual, she was working with didn't know about this or provide her with the details:

So, because I deferred a day early, I [lost out on] like all the financial support that I could have had. Whereas my medical bill, I think I've already spent like five to seven thousand – like I think in total, I'll spend seven thousand dollars in medical stuff alone. It's really expensive and so, I know that other people really deserve stuff as well. Like I don't know their situation and I know that they deserve bursaries and finances as well, it's just sad that because I'm a student with a disability and because I deferred a day early, I didn't – didn't get that support that I kind of need. And some of that was a little- I took that quite hard actually. Um, again like, the person that helped me go through the process of deferring, she didn't know and um, and so I don't blame her in that aspect, it just, it would have been nice if I had a heads up. And I'm sure now she knows, she will advise people differently in the future, so maybe that was a stepping stone for that, so that's nice, but ya... I mean the financial aspect is a little – well not a little, it's very stressful.

Social Barriers: Feeling judged, stigmatized, and self-stigmatization. Experiencing stigma, judgement and discrimination are common to individuals living with a disability. For the participants in this research, stigma in their day-to-day life added to the stigma that presented itself in their experiences as medical students. Each of the participants had unique experiences, but stigmatizing moments stuck with them.

Oftentimes, people were not purposefully judgmental, or discriminatory but stigmatizing attitudes were reflected in their actions. Natalie felt that certain situations were isolating and a result of systemic discrimination. In part, she felt like this was because “the system isn't made

for someone like me because it's created by people who don't have disabilities". She went on to describe the isolation and stigma she would feel during lectures:

...Even sometimes just in class, like I would sit in the front and... Like I would be by myself, like 2 seats empty, whereas everyone else was like crammed and I'm like I would see that as a little bit isolating. And I can't assume that it was because of my disability, but it's kind of a thought in the back of my head in my mind.

For Katie, the social stigma and judgement she experienced affected her willingness to disclose her disability, both to peers as well as to the accommodations committee. She felt like people's stigma arose and discrimination occurred when she revealed her disability saying: "...It's this card I need to play to help get things moving but even then, I don't feel like I'm heard from." She felt exhausted from constantly advocating for herself and not getting the support she needed. She said:

My perception is that when I try to advocate on behalf of myself or my disability and advocate on behalf of myself, it is seen as it's not common in medical school culture – to advocate for yourself. It's more or less you take what you're getting, and you walk away with it, even though that's not right.

Penelope felt that the stigma and discrimination she experienced came from a lack of understanding and the fact that her disability was invisible, explaining that "It's not, like, conscious discrimination or conscious, like, being rude or mean, it's just a lack of understanding if that makes sense." As a result, she said that "People don't really take me seriously when I say something, I look very healthy and so when I tell people I have problems, um I face a lot of hurdles because they don't believe me."

As mentioned, the stigma, judgement, and discrimination experienced by the participants was often an isolating experience, ultimately feeling like they were alone in their journey.

Natalie felt like she was abandoned by the school and that said that they:

Have just swept me under the rug. No one has checked in with me, like I've never heard from this physician person who's supposed to help me... And they're like 'Oh, sorry, like we reached out and there wasn't anyone and I guess that message never got to you'.

Barriers indirectly associated with medical education

Invisible disabilities. All of the participants spoke to the challenges of having an invisible disability and the fact that just looking at them, you wouldn't know that they had a disability. This is specific to this group of participants and would not necessarily be the case with a different group of participants living with other types of disabilities. One of the disadvantages of having an invisible disability is that others didn't understand the experiences of an individual with an invisible disability because you can't visually see what they're going through. Penelope said:

I mean, with an invisible disability, no one ever really truly understands. Like if I was – like if it was something they could see, they could see the gravity and the severity of it, it would have been a little bit different. Um, so, but I mean, everybody was trying to understand, which is nice.

This applied not only to students but to instructors and clinical preceptors as well. Part of the challenge of others not understanding the severity of an invisible disability is often a result of a general lack of understanding about certain types of disabilities. Penelope explained that:

I think it's the nature of my disability that, that you can't physically put a number on, like you can't visually see it. And so, even like health care professionals that are trained and have a specialty in brain injuries. They have a difficult time figuring out what's wrong with you, and so I don't blame them for not knowing, but it's also – if you don't know something, you should like learn it, because it could help your students in the long run, if that makes any sense.

Ultimately, this led to her questioning her own experience and her symptoms, leading her to feel silent in her journey and preventing her from sharing her struggles with others.

I feel like when you have [an invisible disability] ... you almost second guess how severe it is because again, you can't measure it and like – and so, I was quite silent in it, to be quite frankly. Not a lot of people, like, knew the severity of it. So, I didn't really have a lot of instances, where someone COULD be negative.

For Natalie, the fact that her disability was somewhat invisible was a challenge from the beginning of her medical school education because she knew she was different from her peers. She wasn't sure to whom or how she should disclose her disability and was unsure of how this would affect her relationships:

...We start with orientation and obviously, I was really nervous coming in knowing that I'm different from (laughing) than everyone else. And so... my disability isn't really visible. Like if you look at me, I look like any other student and sometimes I see that as an advantage, but sometimes it's a disadvantage. So, going in, it's always the aspect of like, how am I going to disclose, to who am I going to disclose this, should I disclose this? Like all these questions are always – like in terms of my peers.

On the other hand, Katie chose to not disclose her disability to many of her peers because

of the pushback she received from classmates in high school after disclosing her invisible disability. She experienced stigma and feared that her classmates in medical school wouldn't understand what she was going through or wouldn't treat her as an equal:

My disability is invisible ... It's covered with clothing, it's not like I'm in crutches or in a wheelchair, you know? It's like – I can hide it. Um, so it's like, the reactions I would get in high school were like 'oh you don't look sick' or like 'you look fine' when I'm actually like half medicated right now. So that was the main reason. Two, I just wanted to be on the same level playing field as the, but, um, I do get a lot of like 'wow, you take so much time off school'.

Communication barriers. Communication barriers between different channels were common to several of the participants. Not only were these challenges in communication frustrating, but they were time-consuming and the participants accessing accommodations believed them to be detrimental to their academic and clinical experiences.

Both Natalie and Katie experienced barriers between the school, themselves, and preceptors/clinical coordinators, which ultimately led to confusion. Natalie noted that "...In my other sessions, like, there was sometimes like a miscommunication. Cause I didn't know if the school was sort of informing my, my umm... My, um like my preceptors that, that they had a student with a disability." Katie had similar experiences when it came to her integrated community experiences:

NOSM did not communicate to my community, to my community mem- like, my Indigenous community members that I had a registered disability. Like they didn't... Because I found out about that after. At the end of my placement, I went to NOSM and was like 'Why didn't my community know about it? Did you tell them?'. They were like

‘No, we didn’t tell them.’. So, I’m like ‘Why aren’t you telling communities in sec- in confidence, in confidentiality though? Like hey, one of your students has a registered disability, in case it ever comes up, just know that, please allow that have the flexibility toward her schedule and I hope you can appreciate that... Or something like that.’ That conversation was never had, between NOSM and the, the community. And because of that. There were no support systems for me when I was there.

Another communication barrier experienced by the participants was that they wish NOSM had better informed them about disability policies for students with disabilities. Due to challenges with her disability, Natalie struggled with certain aspects of clinical placement, and she wished NOSM would have been more transparent about clinical expectations and requirements from the beginning saying that “[She thinks she] would have liked to have been told a bit more specifically what the clinical side of the program entailed.’ She ultimately explained that having this information could have impacted her decision to start medical school in combination with a reflection on her personal limitations as a result of her disability. That being said, it is not only the school’s responsibility to be aware of such information, and the students hold a certain level of personal responsibility for obtaining this information. Similarly, Penelope felt like she was supposed to know what accommodations she needed when speaking to the Student Accessibility Service and this is challenging because accommodations are based off of physician’s recommendations and not the students’ requests.

Meanwhile, Katie only happened to learn about certain accommodations after sharing her experiences with getting certain accommodations during her undergraduate degree:

I just said anecdotally, ‘Oh my old school, my old undergrad used to have recorded lectures for me’. And they’re like ‘oh we have – you have access to them’. How did

nobody tell me about this? Like until the end of my first year or something. So now I have access to recorded lectures.

It took until the end of her first year to gain access to these recorded lectures and not without challenges, as there were often tech glitches with the lectures and sometimes, they simply were not recorded. Before having access to recorded lectures and when she had to travel to doctor's appointments and treatments for her disability and missed lectures and other sessions, she had had to rely on notes from a peer or filling in her own slide decks.

Other themes

Barriers outside of medical school. Not only did the participants encounter barriers throughout their medical school journey and as students, but they each faced barriers outside of their education and in their personal lives. Compounded with the barriers they face in medical school, this tested their resiliency and was emotionally taxing and exhausting.

Natalie spoke to the emotional challenges of being a medical student with a disability saying that “this took a serious toll on me psychologically and I told Learner Affairs about it, and they sort of referred me to use those services.” When seeking external support before starting medical school, Natalie sought guidance and advice from the Canadian Association of Physicians with Disabilities during her undergraduate degree and the response was discouraging:

I had looked at that during my undergrad and I had asked ‘oh how do you guys support people like I’m thinking of applying...’ and they’re like ‘Well, we can’t help you because you’re not actually a student’. So that kind of turned me off, so then when I did get to medical school, I didn’t think of that as an option.

Similarly, Katie's experiences were impacted by a lack of support, but for her, it was a result of being isolated from her hometown and family. She had had to move to Southern Ontario for medical care as a teenager, leaving her family and friends, and then started medical school in a new city as a 22-year old:

I was an inpatient at Sick Kids hospital in Toronto is where I received my care. And um, I'm from a rural community, originally, so that's why I had to travel to Toronto, downtown, to get care. So that was very difficult for me, being away from my hometown.

Penelope has struggled with the fact that as a result of her disability, she was currently not able to engage in her past times and hobbies. This didn't stop her from enjoying her free time and has ultimately led to her searching for new hobbies that were possible for her while experiencing symptoms:

And so, um, I can't really do the things that I love, which is physical activity or reading because those are the two hard things. But I'm trying to be a little more creative in the sense that I'm trying to do knitting, I'm trying to do yoga, I'm trying to do meditation, um, all of those things that they suggest. I have to do them, in like, small quantities at first. Um, but I'm trying to like expand my... um, hobbies, whereas before it was just like friends, like hanging out with friends and reading and sports and physical activity, because I can't really do those three right now.

Social situations also presented barriers for Daniel. As a result of his disability, he developed listeners' fatigue, but this ultimately improved his social skills as he became aware of his disability and recognized he needed to be more attentive. He explained that this would be the

greatest barrier to his disability as he has not been presented with too many challenges in his medical education thus far:

You know, I often get what's called listener's fatigue where I really have to strain myself to talk to people on my left side in places like restaurants or bars or clubs or whatever and I get quite exhausted, um, listening, I often, actually people say I'm a very good listener because I'm so attentive because I have to be and I say it because I have no choice, otherwise I'm going to miss everything you say, but ya, it definitely comes with fatigue and such, but I try to avoid it by getting my friends to switcheroo and such.

How their disability has impacted their journey in medicine. For each of the participants, living with a disability has impacted their journey in medicine. Each participant had a passion to help others, but their disability impacted either their reason for choosing to pursue medicine or shaped their values and expectations of themselves as future physicians. For Katie, her disability was ultimately the reason she chose to pursue medicine. After developing her disability as a teenager, she knew that by pursuing a career in medicine, she could apply her own in-patient experience to the table and share those experiences with other patients:

I never always wanted to be a doctor. I only wanted to be one when I was first diagnosed with my condition when I was 16 years old and so, that's what really brought myself to the healthcare system. So, it was just being an inpatient at the hospital, um, learning about the roles of the physicians and just realizing how important it is as a patient, like with my patient experience, to bring that to being a physician.

Similarly, Natalie's interest in medicine also came from her own experiences as a patient. Contrary to Katie, she saw shortcomings in the healthcare system and had negative experiences

with physicians caring for her and wanted to bring humanity to the patient experience. She decided to combine her passion to help others with a need for more empathetic and compassionate physicians and described that she chose to pursue medicine because:

I'm going to say my desire to help people, but also my experience as a patient in the healthcare system... Considering the nature of my disability, I've been in, uh, in contact with different physicians and I found that sometimes, the way I was treated, I didn't appreciate and I was like 'this can't be what they're learning, right? Like, there's got to be more to medicine, there's got to be that, that humanity side to it and I, I think that's really something that, you know, pushed me towards medicine, thinking 'I can go in there and change the system. I know what it's like to be a patient and it's hard and if there's, you know, if there's a doctor who's more supportive and understanding, I think that that's something I'm able to do.

Natalie spoke to the added challenges she experienced as a medical student with a disability, saying "it's a very difficult time for anyone and, you know, having a disability brings another level of stress." She, along with all other participants, spoke to the fact that as medical students living with disabilities, being resilient is almost essential.

For Daniel, medicine had always been a prospective career and upon solidifying his aptitude and passion for sciences, he knew that a career in medicine would provide him with the ability to work with others, share his devotion to promoting health and wellness, and that he could also share his experience with others by eventually teaching. His disability had less impact in why he chose medicine, but he recognized that it has made him a better listener due to his need to be attentive during conversations. He said, "people say I'm a very good listener because I'm so attentive because I have to be and I say it's because I have no choice, otherwise I'm going

to miss everything you say.” He noted that these listening skills will help him when challenging situations arise such as in social situations or in loud clinical environments.

Penelope developed her disability just prior to beginning medical school. While she has not had as much time to adjust to living with a disability, she explained that her experiences will enhance her abilities to empathize and communicate with patients:

[As a] health care professional in the future, I’ll not only be able to sympathize with people that have a similar story as me... but anything when it comes to like an acute and chronic disability or hardship or like mental health or struggles with anything, I think that I’ll be able to understand what they’re going through and understand that maybe not asking like ‘what can I do to help?’, but maybe like giving them suggestions of what they can do to help because when you’re on the side that you’re having a difficult time, you don’t know what you need until someone suggests it.

Another way that living with a disability has impacted their medical school experience is that for most of the participants, living with a disability has been the most challenging aspect of medical school. Specifically, while many individuals worry about the academic load of medical school, Natalie felt like she was ready for this. She stated that her biggest challenge in medical school was:

...Definitely disability related. Um, So I feel like coming into medical school, a lot of people will say like academically this is going to be hard, this is going to be difficult. And I was like you know what, I know... I know the kind of student that I am. Like as much as I do not have a science background, I learned a lot like I had physiology, anatomy, um, like chemistry and health and disease. Like I had a good background

coming in and I felt sure of that. So, I knew that academically, I was going to do fine. And in fact, believe it or not, I finished top of my class in first year.

On the other hand, Katie spoke to the fact that as a result of living with a disability, she knew that medicine and medical school were going to take a huge physical toll on her body and that because she often had to miss school for appointments and treatments, that she would have to work harder than many of her peers:

Um, the most challenging thing? Ya, 100% it's disability related. I think the – for me, I've always, um, known that I'll have to work 10x harder than my able-bodied counterpart, which is the exact same thing in medicine. So um, like being able to, uh, keep up with my classmates and what I really, really worry about is clerkship. So, I don't know if you know about our third year, we have 8 months of clerkship, which is like purely clinical. So you'll be, I'll be in the hospital 24/7 working 17-18 hours a day sometimes I'm on call 24 hours, in surgeries, standing still in one position, for like 9 hours, so I'm just like – that's my biggest worry, is the physical demand on my body, through clerkship.

For each participant, their experience of living with a disability has impacted their journey in medicine. From their experiences as patients to their abilities to foresee challenges in the future and how they will communicate better with patients, these experiences will strengthen their abilities to provide patient care and be empathetic to the needs of others with disabilities and other health conditions.

Summary of results

Four interviews were conducted and analyzed. The participants each provided unique

perspectives to their experiences as individuals living with a disability at the Northern Ontario School of medicine. Collectively, they identified and discussed barriers directly associated with their medical education, barriers indirectly associated with medical education, barriers outside of medical school and how their disability has impacted their journey in medicine. Several sub-themes fell under the category of barriers directly associated with medical education and these included: foreseeing barriers in medicine, barriers to the application and interview process, academic barriers, clinical placement barriers, barriers to the accommodation process, a lack of knowledge from professors, disability personnel, and preceptors as well as social barriers. Themes that fell under barriers indirectly associated with medical education included invisible disabilities and communication barriers.

Discussion

This study was one of the first to explore the lived experiences and barriers encountered by Canadian medical students living with disabilities. Specifically, this research was conducted at one medical school in Northern Ontario and the goal of the research was to establish if there were barriers associated with having a disability.

This chapter begins with a summary of the findings of the study and how they relate to the literature. The implications of the study are discussed in addition to recommendations for future research, followed by the strengths and limitations of the study, and finally, concluding thoughts are provided.

Meeks and Jain's (2018) Lived Experience Project was a source of inspiration for this research, and one of the aims of the current project was to replicate this study at one Canadian medical school. Consistent with the Meeks and Jain project, almost all of the barriers encountered by the medical students in this research aligned with the barriers outlined in the Lived Experience Report. Similarly, both of these studies provided medical students with disabilities a voice to share and reflect on their personal experiences. Seeing as we set out to replicate the study, this is not particularly surprising, though we had expected some differences in the Canadian medical education system and NOSM's northern and rural setting.

Barriers directly associated with medical education

Foreseeing barriers in medicine. The participants in this research each foresaw barriers in their future as a medical student and as a physician, many of which were unique to their disability. In particular, one of the common barriers anticipated was knowing that their ability in certain areas of medicine would be limited as a result of their disability. This aligns with other

research in which respondents recognized that living with a disability narrows and limits career choices within medicine, with some even having felt coerced in making these decisions (Mogensen & Hu, 2019; Neal-Boylan et al., 2012). Oppositely, we can consider the fact that many individuals are limited in their specialty choices as a result of lifestyle choices, skill sets, and personal interests. For example, in the current study, both Katie and Natalie recognized that due to their respective physical and visual limitations, surgery would not be an appropriate choice of specialty. Having self-awareness and recognition of one's limitations is important as it demonstrates that these individuals, in pursuing medicine, are also taking into account patient safety and the importance of care of the highest quality (Bulk et al., 2017). Self-recognition of limitations also helped participants in the current study to advocate for themselves and to realize where they need help. This led to them reaching out to Learner Affairs' early on in their medical journey, in one case even before applying to medical school and being transparent with clinical preceptors about situations where they may have difficulties. Transparency was often a personal challenge, as in the case of Katie, where she had previously encountered negative attitudes from peers in high school about her disability, which ultimately led her to often not disclose her disability to others unless necessary. Meanwhile, Daniel, who never used formal accommodations, openly shared his disability with preceptors in clinical learning situations to prevent any miscommunications and to ensure he would maximize his learning. Additionally, this same self-awareness can benefit individuals in recognizing their personal limitations when choosing residencies to apply to and the work environments in which they will thrive.

Barriers to the admissions process. Barriers to the application and interview process did arise for two of the participants of this research, Natalie and Katie. For Penelope, the participant who developed her disability after admission, she explained that having to go through the

admission process with her disability would have been extremely difficult. For Daniel, the final participant, his disability did not affect the admissions process at all. Rather, he found that it benefitted him as a speaking point when discussing personal challenges and resiliency.

In the literature, technical standards are identified as a barrier that affect medical students with disabilities applying to medical school (McKee et al., 2016; Zazove et al., 2016). According to Zazove and colleagues 2016 research, the technical standards of many medical schools do not support reasonable accommodations based on proponents of the Americans with Disabilities Act. Small adjustments to the technical standard and competencies of medical schools could allow prospective medical students who would otherwise not be qualified to apply, to do so. It is important to note that there may be a need to update the technical standards and the methods in which these standards are utilized by schools. The American Association of Medical Colleges' has not updated their standards since 1993 (Kezar et al., 2019). Canada, on the other hand, has updated theirs for the upcoming 2021 admission cycle (Association of Faculties of Medicine of Canada, 2020). These updates could help schools to develop technical standards that support the application and acceptance of medical students with disabilities and to be clear in their expectations. Furthermore, these updates should also consider the advances in medicine, medical technology and medical education that have occurred in the past three decades that allow better support of individuals with disabilities in medicine. Examples of the use of tools may include amplified stethoscopes that aid people who are deaf or hard of hearing, and assistive computer technology that can modify the way that EMR's are presented for individuals with visual disabilities.

To apply to medical schools in Ontario, all students are required to meet the standards and competencies listed by the Council of Ontario Faculties of Medicine (2016) in their

document titled “Essential Skills and Abilities Required for Entry to a Medical Degree Program”. These include observation, communication, motor skills, behavioural and social attributes in addition to intellectual-conceptual, integrative, and quantitative abilities. For many students with disabilities, including the participants in this study, they may meet most or all but one of these standards, which prevents them from succeeding in medicine or struggling to do so. VanMatre and colleagues (2004) found that when they asked medical students, residents, and physicians about technical standards and medical school requirements, 70% of respondents disagreed with the fact that a student should meet every standard and have all of the skills to enter any specialty. This speaks to the idea that medical students with a disability can be successful in most areas of medicine, while not meeting certain competencies specific to a certain discipline due to their disability. Not only does this apply to students with disabilities, but it can also apply to able-bodied individuals who may be interested in medicine but lack certain skills or aptitudes. For Katie, she mentioned that she knew that she would not be able to pursue a career in surgery because of the effects that her disability has on her joints and her inability to remain standing for many hours. Nevertheless, due to the wide scope of medicine, this one shortfall will not prevent her from becoming a successful physician in a field unrelated to surgery.

Academic Barriers. Academic barriers included restrictions in the style of learning that a student with a disability can utilize, barriers to testing situations, as well as challenges to the way the curriculum is presented. While academic barriers can arise for students with disabilities and able-bodied students alike, academic barriers in the current study presented themselves and developed for medical students with disabilities in ways that were unique to an individual’s disability and symptoms. Some students have disabilities that restrict certain types of learning

and often, there are ways that schools can provide equal access to learning opportunities, as Meeks and Jain (2018) mention in their Lived Experience report. This might mean having services and accommodations available such as having a scribe to take notes for these students or in the case of recorded, asynchronous lectures, ensuring that closed captioning is available. This means that for students, such as Natalie, who was not able to learn in certain ways due to her disability, developing solutions to better support their learning is critical for success in medical education. While she was given alternatives to visual learning, with which she struggled as a result of her disability, she found that these options were isolating, ultimately foregoing these alternatives. At this point, when a school has done the duty of offering reasonable alternatives, a student's decision to forego alternative ways of learning is their choice. With the input of these individuals and disability professionals, it is important to consider alternative methods of learning content that will not only support students with disabilities but students who have different learning styles.

The participants spoke to the rigour and demand of NOSM's undergraduate medical program, which is to be expected of any medical school and medical education in general. There were many mandatory in-class sessions and for individuals with disabilities also dealing with their health struggles, this was challenging. It leads to medical students with disabilities having to find a delicate balance between academics and wellness, where their wellness often took a back seat as a result of mandatory sessions. This led to a couple of different questions. Should all sessions be mandatory? For most, the answer would be yes, considering the large amount of information to be learned by medical students. Lectures, topic-oriented sessions, and laboratory sessions are invaluable learning opportunities where students learn a wide range of information and skills. In the case of participants in this research, it was not necessarily a question of having

to attend mandatory sessions but having the ability to do so from a distance or at a later time without there being an effect on professionalism marks when away from classroom sessions due to appointments or symptoms. While the school offered students with disabilities access to recordings of sessions to ensure equitable access, Katie mentioned that there were often technical glitches or failed recordings preventing her from accessing these lectures. Thus, while the school was committed to providing equitable access to lectures for students with disabilities, there were almost always some technological glitches or misses when using technology.

While Katie wished there would have been a way to apply to medical schools in Canada while completing a part-time undergraduate degree, this led to another question: Is it possible to attend medical school part-time? Currently, the answer is no, but some researchers believe that it is an injustice for medical students with disabilities who enter programs that are inflexible and affect their wellness (Bulk et al., 2019). It is also important to consider that there are policies in place making these programs rigid, and in part, it is believed that this is due to the idea that medical students need to prepare themselves for the demand and rigour required of a physician (Bulk et al., 2017). This is a fair statement because students do need to be prepared for their careers as physicians, but it is also improbable for medical schools to design and implement part-time programs for individual students with specific needs that logistically coordinate with the regular medical education program for all other students. Alternatively, this may mean updating policies and program guidelines to allow students to complete certain components of medical school in a part-time fashion, while ultimately preparing these individuals to succeed as physicians. For example, students might be able to forego certain clinical sessions during the academic year to lighten their workload, but instead, have to do these sessions over the summer to keep pace with their peers. Although there is no current knowledge of medical schools

offering part-time education, future research might consider a pilot project to explore when or how part-time work affects students with disabilities. This type of offering could also support other students such as those students with childcare needs as well as students who bear children during their medical education, albeit could be more expensive in the long run.

Clinical Placement Barriers. Clinical placements are an opportunity for medical students to interact with patients, to develop clinical skills, and to learn about different areas of medicine as they move from one specialty to the next (Northern Ontario School of Medicine, 2020). NOSM has three Integrated Community Experiences, where students have one placement in an Indigenous community and two placements in rural communities, all within Northern Ontario. This is followed by a Comprehensive Clinical Clerkship in third year followed by a number of rotations in different fields in fourth year (Northern Ontario School of Medicine, n.d.). One barrier encountered by Natalie and Katie, who had sought accommodations for clinical placements, was that they felt like their suggestions for potential accommodations were sometimes dismissed or resisted. As mentioned previously, accommodations are based on physician recommendation and thus a student's suggestions are not the basis for those accommodations provided. One of the accommodations that both of these students sought out was to have a peer that knew about their disability present with them on their placement as support. In part, resistance to this type of accommodations could have been a result of the potential burden that could apply to the peer and the effect that it would have had on their education and clinical experience. Although it may not seem like a huge obligation, this could have added stress to the peer and ultimately prevented them from fulfilling the requirements and components of their clinical experience. While Natalie had no problems accessing this accommodation as she required a peer that would be able to drive and to also support her in her

activities on her placement due to the functional limits of her disability, Katie encountered resistance in this process, which ultimately led to her not seeking accommodations in future placements due to the stigma and negativity she encountered. While disabilities and individual symptoms differ, it is important to consider the reasons why one student had easier access to specific accommodations, while another struggled to get accommodation that they thought would support them. On one hand, the accommodation committee had to consider whether this type of accommodation was necessary due to a student's functional limitations and how it would have benefitted or hindered both of the students' experiences, and this differs from disability to disability. Additionally, it is not up to the accommodations committee to respond to individual students requests for accommodations but to establish appropriate accommodations based on the individuals' functional limitations. On the other hand, it is not only a matter of these individuals having to develop skills on their own and to prepare themselves to be independent physicians as Katie mentions, but also a matter of adequately supporting students with disabilities. In particular, this affected those with invisible disabilities when placed in rural communities, away from their support systems, and in particular, distanced from their medical teams.

Barriers to the accommodation process. The accommodation process is daunting for medical students with disabilities. In a sense, this process can act either as a gatekeeper or a relief for medical students with disabilities (Mehta & Clifford, 2017). Barriers to the accommodation process may be due to institutional barrier affecting downstream levels of influence when considering the social ecological model (Bronfenbrenner, 1979). Several challenges presented themselves as a result of the accommodation process. In the current study, the participants found it challenging that they were expected to know what type of accommodations that they could access, that they were expected to maintain these

accommodations even in the case that their disability progressed, or symptoms changed, and that they often didn't feel like they were fully accommodated. Does this fall to the medical school, the students' physicians or the students themselves? While the medical school can support the student in accessing the accommodations that they require for equal participation, it is also the student's responsibility to speak up for themselves and advocate for their needs if their symptoms or limitations change. One solution would be for students to have regular check-ins scheduled with their Learner Affairs Officer to discuss their accommodations, changes in symptoms, and changes that they feel might need to be made to ensure regular communication between the medical school and the students.

Students entering medical school with a disability may face plenty of unknowns as they transition to a new learning environment, but the same can be true for their peers without disabilities. The accommodation process can add to this when students are unaware of the accommodations available and the fact of the matter is that accommodations are not given for a specific disability, but for the functional limitations that interfere with the student's equal participation in a specific setting. Participants in this research felt like suggestions for accommodations had to come from them and this was challenging because their medical education differed significantly from their undergraduate degrees and as a result, many learning sessions differed. This also opposes the fact that accommodations are not based on students' suggestion and rather come from recommendations from the student's health care professional. While it is not up to the school to offer every accommodation under the sun to students, it seems that based on the current study that there is more education needed for students with disabilities to make them aware of the types of accommodations available to them, how these accommodations would work and the conversations they need to have with their health care

providers to discuss potential accommodations. This isn't a fix-all solution though, as Natalie mentioned that every exam, she wrote in her first year was written with different accommodations. For many students, troubleshooting is part of the process and while necessary to properly accommodate individuals and their respective disabilities, can also be very frustrating.

Not feeling fully accommodated was also a challenge that arose as a result of barriers to the accommodation process. Part of this had to do with the fact that students did face some resistance in accessing certain accommodations, such as the three participants who had accessed accommodations, as mentioned above. This created tension between the student, the accommodations committee, and other parties involved. This is documented in the literature as a tension that arises because some individuals feel like accommodating students in health care professions does not prepare them to be productive as professionals since accommodations are not necessarily available in the workplace (Easterbrook et al., 2019). While this may or may not be true, this type of mindset assumes equality rather than equity in considering students with disabilities in comparison to their able-bodied peers (Easterbrook et al., 2019). Ultimately, such as in the case of Katie, this leads to students not accessing accommodations that may provide them equal opportunity because of the scrutiny that they are under. Bulk and colleagues (2017) mentioned that this is something that occurs during clinical placements because students do not want to 'rock the boat'. Similarly, Katie stopped asking for accommodations in her clinical placements because she was afraid of 'poking the bear'.

A lack of knowledge from professors, disability personnel and preceptors. For students entering medical school with a disability, knowledge of their respective disabilities often surpasses the understanding of professors, disability personnel, and preceptors. A lack of

understanding about disabilities and the experiences of individuals with disabilities from medical school faculty and staff leads to barriers for these students because of the feelings of isolation that this leads to (Meeks, Herzer & Jain, 2018).

In Meeks and Jain's Lived Experience Project (2018), participants spoke to the fact that there is a lack of curriculum on disabilities. Participants in the current study spoke to the fact that they wish that others learned about their respective disabilities during their undergraduate medical education. This not only included their peers, but faculty and preceptors who also didn't necessarily have any background knowledge on their disabilities or other common disabilities. The participants would like for other individuals from the community to speak about their own patient experiences to provide perspective into the lives of individuals with disabilities and how their disability affects them. In particular, the participants would like individuals to know more about the different types of invisible disabilities that exist and how symptoms and the effects of these disabilities can differ. This is consistent with Meeks & Jain's Lived Experience Report (2018) which suggests that there be increases in disability curriculum and Crossley's 2015 work demonstrating the beneficial effects of such changes. Including these types of sessions in undergraduate medical education could help to develop empathy and compassion in future physicians. In doing so, it would also be necessary to consider the privacy of individuals sharing their stories and to keep session content confidential. This should not be surprising to medical students as the importance of confidentiality with patients is discussed early on in the curriculum but having disclaimers before these presentations could further support this.

In concordance with another barrier identified by Meeks and Jain (2018), participants identified gaps in the knowledge of disability personnel and administration at the university. For Penelope, a lack of knowledge about deadlines for bursaries and scholarships led to her being

ineligible for funds due to deferral one day too early as a result of her disability. This caused a lot of personal distress and while the individual assisting her now knows about these deadlines, it may have had a large financial impact on this participant. Having disability personnel, administrative staff, and others kept up to date on these timelines and other deadlines can help to prevent this from happening in the future and to better support medical students with disabilities. Not only would this benefit students with disabilities, but all students seeking financial aid, which in medical school, is the majority of students.

Social Barriers: Feeling judged, stigmatized and self-stigmatization. For individuals living with a disability, medical student or not, the stigma that exists can be one of the greatest barriers. Not only can this stigma affect individuals from a societal and institutional manner, but it can affect individuals in everyday experiences, ultimately leading to them feeling negative about themselves and to the development of self-stigmatization. Stigma and social barriers such as negative attitudes from peers and professors, doubt about one's abilities as a medical student with a disability, and self-stigmatization continue to be major barriers present in the literature as well as in the current research (Jain, 2019; Meeks, Poulos & Swenor, 2019; Stergiopoulos et al., 2018; Yeowell, Rooney & Goodwin, 2018; Bulk et al., 2017; Meeks & Herzer, 2016).

When it comes to disclosing disabilities, one of the reasons that an individual may choose not to disclose their disability to peers, faculty, and even the medical school is because of negative experiences that they have had in the past. This was true for Katie, who had encountered stigma in high school when disclosing her disability, and she chose to disclose her disability to very few peers upon entering medical school. Yeowell and colleagues (2018) reported similar findings when exploring the disclosure of individuals with disabilities and reasoning affecting their decision to disclose or to not disclose. In their study, two of the reasons

for not disclosing included negative and stigmatized experiences at school and fear of workplace discrimination (Yeowell et al., 2018). While the participants in the current study had all disclosed their disability to faculty, peers, or the medical school in one way or another, Jain (2019) suggested that the greatest barrier for disclosure of a disability by medical students is the stigma that exists and the risks that it may have on their career. Additionally, Stergiopoulos and colleagues (2018) found that students felt that if they did choose to disclose their disability, others would think of them as incompetent and unable to be successful in medicine. This speaks to self-stigmatization as these individuals were creating negative thoughts about themselves without even experiencing negative attitudes from other people and rather, believed that this is how others would think of them.

In the lives of medical students with disabilities, social barriers and stigma can be compounded by their personal lives and their position in medical school. Many of the situations that are stigmatizing or negative for medical students with disabilities are not done purposefully by others but may be unconscious or a result of systemic discrimination of individuals with disabilities. Natalie spoke of situations where peers isolated her and left her sitting alone at the front of the classroom and while their intentions were not hurtful or malicious, actions like these still had a negative effect. Not only can these situations be isolating, but they may lead to self-stigmatization, where individuals with disabilities develop negative thoughts about themselves and their roles.

Barriers indirectly associated with medical education

Invisible disabilities. It is by chance that all of the participants in this research had disabilities that they identified as being invisible, but it speaks to the many individuals who live

day to day without others knowing that they have a disability. Their results may have been quite different if more participants had been recruited or if participants had a more visible disability. Although there was no point of comparison in the current research, one study found that students with invisible disabilities have more difficulties managing school compared to individuals with visible disabilities (Deckoff-Jones & Duell, 2018). In the current study, participants explained that having an invisible disability could be an advantage because many do not know that they have a disability or have functional limitations, but that it also came with certain disadvantages as people do not fully understand or believe what they're going through if they do choose to share information about their disability. This occurred with peers, professors, and clinical preceptors alike and in part, was a result of the lack of knowledge about certain disabilities and rare conditions. This was emotionally taxing and ultimately led to individuals questioning their own experiences with a disability.

Communication barriers. In communicating between students, Learner Affairs, the accommodations committee, placement coordinators, and placement hosts and preceptors, there are many opportunities for the breakdown of communication to occur when supporting medical students with disabilities. Emerson (2017) spoke to the importance of communication as he himself was a medical student with a disability and highlighted the importance of maintaining communication between the many pillars of medical education. Consistent with this phenomenon, when Katie asked for breaks and a day off while on her Integrated Community Placement in an Indigenous community, not only were her placement hosts confused and taken aback, but her placement coordinator at the time was unaware that she was a student with a disability. In part, this could be due to legal restrictions in that the medical school cannot share personal health information, but alternatively, Katie could have been taught how to disclose this

information to get the appropriate supports. As a result, she lacked the supports that would have provided her with equal opportunities to her peers. How can we ensure that these conversations are being had from the first point of contact when a student seeks accommodations through the many avenues of communication in medical school? This should be explored because it could benefit the lives of students with disabilities, while also strengthening bonds with community participants and eventually lead to greater acceptance and inclusion of students with disabilities in medicine.

Another communication issue that arose had to do with the lack of knowledge about what accommodations were available when first seeking assistance from Student Accessibility Services through the students' host university. Specifically, Penelope felt like she was supposed to already know what accommodations she would need after developing her disability the summer before she started medical school. Although accommodations were available and she was able to obtain certain accommodations to support her needs, she wished that she had been better educated about the accommodations that she could access and that she be informed that this discussion needed to happen with her physician who would be making the recommendations for accommodations. Perhaps, one way of supporting both students and disability personnel in this manner would be to collect data on what types of accommodations individuals with certain disabilities receive in a graduated list based on the severity of an individual's symptoms across medical schools and even different specialties in medicine. This could be useful to the students, their physicians and accommodations committees alike. Students need to be better educated about disability and accommodations policies upon reaching out to the Learner Affairs and Student Accessibility Services to understand that accommodations are based on functional

limitations as assessed by a healthcare practitioner, and not a student's preference to have specific accommodations.

Other Themes

Barriers outside of medical school. As with any individual living with a disability, the experiences of medical students with disabilities not only affected their education and career paths but their personal lives and well-being. Stergiopoulos et al. (2018) highlighted the fact that medical students with disabilities encounter barriers as medical students, as individuals with a disability and the combined role, ultimately presenting unique challenges to these individuals.

In the current study, some of the barriers outside of medical school identified by participants included the emotional challenges of being a medical student with a disability, the distance between themselves and their support systems, the need to adapt to changing symptoms and abilities, as well as challenges that could arise in social situations. Participants may have encountered one, all, or some of these barriers, and yet, the added weight caused stress in the personal and academic lives of these individuals. By supporting their integration in medical school and their careers as physicians, we could potentially alleviate the stress of some of these barriers. Feeling included and being treated as an equal in medical school could help these individuals to feel more confident and less isolated, which could also help them to take part in and thrive in social situations. It is important to mention that although this integration would support the inclusion of individuals with disabilities, it would not necessarily protect medical students with disabilities from the harms of society (Bulk et al., 2018). Inclusion in medical school and medical environments would help students to alleviate some of the emotional struggles they may encounter and may lead to them being more open about their experiences and

how they can move forward. (Meeks & Jain, 2018). As Penelope mentioned, it was also important to develop hobbies and skills manageable with one's symptoms, and although these may be different from their normal hobbies and interests; having pastimes outside of medical education supports mental and physical wellness.

How their disability has impacted their journey in medicine. For many individuals pursuing a career in medicine with a disability, their disability has had a considerable impact on this journey. As we learned from the participants in this study, their disability has impacted their reasoning for entering medical school, has prepared them to be better able to empathize and understand the experiences of patients and for three of the four participants, their disability has been the greatest challenge of medical school.

These experiences have reverberated in the literature and since an individual's disability is often a significant part of their day-to-day life, this is also reflected in their medical education and practice. Similar to Katie who spoke to the fact she only began to foresee a career in medicine as a result of her own experiences as a patient, Dr. Dinesh Palipana was also drawn to medicine as a result of his disability (Palipana, D., 2018). He became quadriplegic after being in a car accident. After years of hard work, he now works in the emergency room at an Australian hospital as a junior house officer and is grateful for the positive experiences he has with patients.

For each of the participants, their experience as a medical student with a disability helped them to develop the role of being a self-advocate. Whether it was advocating for the right accommodations or speaking up to educate their preceptors about situations where they might struggle, the participants all learned that to best support their education, they had to advocate for themselves each step of the way. This is similar to the experiences of Emerson (2017), who wrote about his experiences as a visually impaired medical student and the role he played in

advocating for his needs as well as to address the need for strong communication between the medical school and himself.

Finally, it is important to consider the idea that as medical students living with a disability, their disability, health struggles, and experiences are a part of their identity. The participants in this research spoke to the fact that their experiences as a patient have helped them develop skills to become more empathetic and compassionate physicians and as such, is shaping them into the doctors they will become. While we see this is as a positive aspect of their experiences of medical students with disabilities, for many, the part of their identity that is associated to their disability is less positive. As Henderson and colleagues (2012) found in their research, the experiences of living with a disability led to self-stigmatization and feelings of failure. Although the participants of this research did speak to the positive impact that their patient experiences have had on their future career, negative experiences with peers, professors, and patients can negatively affect self-esteem. For the participants who have had negative experiences, it has led to self-doubt. Thus, their disability has impacted their lives in both positive and negative ways, and while the positive experiences will help them in the future, negativity and self-stigmatization affected them in the present. Moving forward, it is important to address the mental health and well-being of students with disabilities, while also educating their peers and professors to treat them in a manner that is not dehumanizing or stigmatizing.

Summary of Key Findings

There were several key findings to this research, which included the presence of several different types of barriers in the lives of medical students with disabilities. These barriers encountered by the participants were categorized as barriers directly associated with medical

education, barriers indirectly related to medical education, and barriers outside of medical education. The results from this research aligned with the findings of Meeks and Jain's (2018) Lived Experience project and supported their research. As in Meeks and Jain's study, the students shared the lived experiences of medical students with disabilities and the ways that their disability affected them. Although the experience of each individual with a disability was unique, many anecdotes and barriers encountered by participants in the two studies were alike in the ways that barriers arose, where they arose, and how they dealt with these barriers. Similarly, social barriers were a theme that emerged in both of these studies and took place in multiple environments – social settings, general attitudes of peers and professors as well as the culture of medicine. This speaks to the general stigma that exists towards individuals with disabilities as well as the ableist culture of medicine. While Meeks and Jain (2018) discussed structural barriers in their research and the many different ways this impacted medical students, residents, and physicians, it was surprising that physical barriers in the learning environments were not more present for the participants in this research. In part, this may be due to the nature of the participants' respective disabilities and symptoms in this research, but also may be due to the adjustments they have already had to make in their day to day lives to function. While NOSM is a relatively new school and accessibility was likely discussed in the school's designs and planning, it would not explain the potential physical barriers that could arise in clinical placements that take place throughout Northern Ontario – many of which in older buildings or hospitals that are dated. Considering the outcomes of this research, the findings aligned with Meeks & Jain's 2018 research in that there is a lack of clear policies and procedures accessible to students, faculty, and administration, leading to confusion and miscommunication among the

different groups. This suggests a need for updates in the policies and procedures outlined by governing bodies and medical schools as well as the need for clearer language to be used.

Although one of the goals of this research was to establish if there were barriers unique to being a student in Northern Ontario, this was not the case after analyzing the interview transcripts. In part, this may have had to do with the very small number of disabilities represented in the sample and the very small sample size. This was surprising because NOSM is unique in that it is a medical school in Northern Ontario with placements and learning taking place in the region, and populations in Northern Ontario are known to face health inequities due to fewer health care resources and poorer access to care (Health Quality Ontario, 2017). As a result, it may be expected that medical students with disabilities would face barriers in accessing the appropriate care for their disabilities in Northern Ontario, but this did not arise with any of the participants.

Implications and Recommendations

Suggestions for Future Research. This research, while one of the first of its kind in Canada, adds to the small but growing body of literature on the experience of medical students with disabilities. This research included a small sample of students from a single medical school in Ontario. Future research can consider broadening the scope by recruiting a larger sample size and by recruiting from various medical schools in Ontario, and in Canada. Another suggestion for future research would be to consider implementing a longitudinal study to look at the barriers that medical students with disabilities face as they transition into different roles and the impact this has on their personal lives and their careers. This could help to identify the barriers that persist over time and to establish how these individuals learn to cope and face different types of

barriers. It would be interesting to survey the mental health and well-being of medical students with disabilities in comparison to their able-bodied peers to explore the effect that being a medical student with a disability has on one's mental health.

Recommendations for NOSM. Several recommendations and suggestions that have arisen from this study for NOSM are:

1. Establish clear communication within the medical school, and between the medical school and students with disabilities as well as host communities.
 - a. facilitate a conversation between the student, Learner Affairs and placement coordinators at the beginning the academic year to discuss that years' expectations, the accommodations that the student can access and pass this information to the host communities and site. All NOSM students already meet with their Learner Affairs Officer at the beginning of the academic year, and including this conversation could benefit students accessing accommodations
2. Include students with disabilities as stakeholders in their education and the accommodation process as well as students without disabilities to ensure a fair process
 - a. Include more than one student on the school's Accessibility Taskforce to ensure that the experiences and perspectives of individuals with different disabilities are considered. Katie, currently a member of NOSM's accessibility taskforce, mentioned the valuable input she has been able to provide. Having representation from students with other disabilities could provide other perspectives.

Recommendations for policy change. Changes to policies will be beneficial moving forward as we work to make medical schools inclusive to medical students with disabilities. Policy changes affect the organization level when organizations such as the CACMS develop, with the

help from Canadian medical schools and a panel of individuals, the guidelines for Canadian medical school technical standards as well as disability policies at individual medical schools:

1. Revise and enhance the clarity of guidelines for acceptance of medical students with disabilities.#
 - a. Modify languages used in policies to reflect the experiences of both able-bodied students and students with disabilities with clear and specific expectations#
 - b. Examine policies from a social and experiential perspective of students with disabilities and reflect on how these may affect and be affected by policies defined in terms of able-bodied students#
 - c. Have individual medical schools clearly outline the expectations, treatment of and support for students with disabilities in the admission process and easily accessible on their website
2. Review and update policies every two years and require governing bodies and individual medical schools to do the same
 - a. Reflect on the past two years including challenges, what has worked well, and assess new suggestions for supporting medical students with disabilities and areas that require change.
3. Revise and update requirements of technical standards at a national and provincial level and require medical schools to update their technical standards to reflect changes
 - a. Reform technical standards to promote inclusivity and transparency as well as increasing the knowledge of medical school employees about protecting students with disabilities.

One of the first recommendations for policy change is that the guidelines for accepting

medical students with disabilities require more clarity and specificity. As Shrewbury, Mogensen, and Hu (2018) explain in their analysis of governing bodies of medical education in the United Kingdom and Australia, there is a need to modify the language used in policies as they often are written in ways that reflect the experiences of able-bodied students. Using clear and specific language that describes the expectations and methods of supporting students with disabilities can help support the journeys of medical students with disabilities as they navigate the admissions process, the undergraduate medical student experience, and disability policies. Other research identifies the need to examine policies from the social and experiential perspectives of students with disabilities and how their experiences may affect and be affected by policies that are innately exclusive to able-bodied medical students. Having policies at individual medical schools that highlight the expectations, treatment of, and support for students with disabilities can help students with disabilities make decisions that will impact their medical education and personal lives, from choosing the appropriate school to ensuring they can access the accommodations they require. Time also plays a role in the development and change of policies, and policies should be updated periodically to reflect changes in society, disability culture, and medical education. Reviewing current policies every two years could provide the opportunity for medical school governing bodies and individual medical schools to reflect on the past two years and what has been learned in supporting medical students with disabilities and areas that require change.

Study Strengths

This research adds to the current literature on medical students with disabilities. In particular, this research provided a voice to students allowing them to share their personal

experiences as medical students with disabilities in hopes of eradicating some of the barriers that currently exist. The experiences of four students were explored in detail.

The study design, using a qualitative descriptive method, was another strength. The research involved a flexible approach that was amenable to the theoretical framework used and allowed the use of a semi-structured interview where participants were able to guide the conversation and describe their unique experiences (Neergard et al., 2009). This study design also aligned well with the chosen method of data analysis, which was Braun and Clarke's (2013) thematic analysis. This is an evidence-based data analysis commonly used in descriptive research allowing the themes to be generated directly from the interviews.

Another strength was the use of the social ecological framework (Bronfenbrenner, 1979). Use of theory and specifically, this model, helped guide the development of themes and organization of the results. It helped to distinguish the types of barriers faced by the participants. As a result, barriers were identified at the system level, such as in the content of technical standards, at the institutional level of the Northern Ontario School of Medicine itself, and at the micro-level as participants interacted with peers, preceptors, professors and friends.

Study Limitations

There were several limitations of this research. Limitations included the small sample size, the presence of several potential sources of bias, as well as the limited generalizability of the results. Another limitation is that much of the research is cited from American sources and while there are similarities to the Canadian medical education system, they also differ in many ways. This is due in part to the fact that the breadth of research on medical students with

disabilities takes place in the United States, but Canadian research was identified and examined as well.

The greatest limitation to this research was the small sample size, which was due in part to the small sample population. Recruitment was a challenging process, and after the first round of recruiting only led to two participants, a second round of recruiting was performed to gain the attention of potential participants, ultimately leading to the recruitment of another two participants. This is not representative of all students with disabilities in medical school and could very likely have introduced bias into the sample. In order to understand the general trends and barriers faced by students with disabilities at NOSM, a larger sample size would be needed.

There were also several sources of potential bias present in the study, several of which may have affected recruitment and ultimately affected the sample size. First of all, selection bias was possible due to the small sample population and challenges throughout the recruitment process. Non-response bias may have occurred due to fear of revealing undisclosed disabilities and consequences that may have arisen which ultimately may have led to potential participants choosing not to partake in the research or because participants felt they were too busy to participate in the study. Similarly, membership bias may have prevented the participation of medical students with disabilities as they are a stigmatized minority in medicine (Stergiopolous et al., 2018). Additionally, there was a potential for researcher bias as the student researcher was an outsider from the sample population and was an able-bodied individual. Her own opinions and perspective may have influenced the data and results, though measures such as a reflexive journal and peer-review were used to mitigate this.

Finally, the conclusions of this research are limited in their generalizability as a result of the small sample size and the limited number and type of disabilities included. Additionally, the

sampling was limited to one medical school in one province and it would be beneficial to explore the lived experiences of medical students with disabilities across Canada.

Conclusion

In pursuing this research and exploring the lived experiences of medical students with disabilities at one medical school, the body of knowledge of medical students with disabilities has grown. The experiences and barriers encountered by four medical students with disabilities at NOSM supported the themes and experiences of medical students, residents, and physicians identified in Meeks and Jain's (2018) Lived Experience Report. From the four participants interviewed for this research, it was found that they reported experiencing many barriers directly associated with their medical education in addition to barriers indirectly associated with their medical education and finally, barriers outside of medical school. While we had predicted that there would be unique barriers to being a medical student with a disability at the Northern Ontario School of Medicine due to the inequities in access to care as well as the rural placements in which students take part, nothing specific to Northern Ontario arose. As mentioned, this could be due to the nature of the sample and that there were not participants included with a visible physical disability. Each of the students experienced barriers unique to their disability, symptoms, and limitations, which was something that was to be expected. Taken together, this research provided a unique opportunity to provide medical students with disabilities a voice, a tremendous impact when these individuals often feel stigmatized, isolated, and alone.

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Appendix A1 – Laurentian University Research Ethics Approval Certificate



APPROVAL FOR CONDUCTING RESEARCH INVOLVING HUMAN SUBJECTS
 Research Ethics Board – Laurentian University

This letter confirms that the research project identified below has successfully passed the ethics review by the Laurentian University Research Ethics Board (REB). Your ethics approval date, other milestone dates, and any special conditions for your project are indicated below.

TYPE OF APPROVAL / New X / Modifications to project / Time extension	
Name of Principal Investigator and school/department	Rachel Belanger (PI), Faculty of Health/School of Rural and Northern Health; Elizabeth Levin (Supervisor), NOSM
Title of Project	The Good Student or the Good Patient? The Barriers Encountered by Undergraduate Medical Students with Disabilities at the Northern Ontario School of Medicine
REB file number	6019395
Date of original approval of project	August 15, 2019
Date of approval of project modifications or extension (if applicable)	September 13, 2020
Final/Interim report due on: (You may request an extension)	August 15, 2020
Conditions placed on project	

During the course of your research, no deviations from, or changes to, the protocol, recruitment or consent forms may be initiated without prior written approval from the REB. If you wish to modify your research project, please refer to the Research Ethics website to complete the appropriate REB form.

All projects must submit a report to REB at least once per year. If involvement with human participants continues for longer than one year (e.g. you have not completed the objectives of the study and have not yet terminated contact with the participants, except for feedback of final results to participants), you must request an extension using the appropriate LU REB form. In all cases, please ensure that your research complies with Tri-Council Policy Statement (TCPS). Also please quote your REB file number on all future correspondence with the REB office.

Congratulations and best wishes in conducting your research.

Susan Boyko, PhD, Vice Chair, *Laurentian University Research Ethics Board*

Appendix A2 – Lakehead University Research Ethics Approval Certificate



Research Ethics Board
t: (807) 343-8283
research@lakeheadu.ca

September 12, 2019

Principal Investigator: Dr. Elizabeth Levin
Student: Rachel Belanger
Faculty of Medicine East Campus
Laurentian University
935 Ramsey Lake Road

Dear Dr. Levin & Miss Belanger:

Re: Romeo File No: 1467315
Granting Agency: N/A
Agency Reference #: N/A

On behalf of the Research Ethics Board, I am pleased to grant ethical approval to your research project titled, "The Good Student or the Good Patient? The Barriers Encountered by Undergraduate Medical Students with Disabilities at the Northern Ontario School of Medicine".

Ethics approval is valid until September 12, 2020. Please submit a Request for Renewal to the Office of Research Services via the Romeo Research Portal by August 12, 2020 if your research involving human participants will continue for longer than one year. A Final Report must be submitted promptly upon completion of the project. Access the Romeo Research Portal by logging into myInfo at:

<https://erpwp.lakeheadu.ca/>

During the course of the study, any modifications to the protocol or forms must not be initiated without prior written approval from the REB. You must promptly notify the REB of any adverse events that may occur.

Best wishes for a successful research project.

Sincerely,

A blue ink handwritten signature, appearing to be "Kristin Burnett", written over a blue line.

Dr. Kristin Burnett
Chair, Research Ethics Board

/sm

955 Oliver Road, Thunder Bay, ON, Canada, P7B 5E1 | lakeheadu.ca

Addendum: Research ethics approval extended on September 2, 2020 for one year.

APPENDIX B - Sample Recruitment Poster

**Are you a current or past medical student
that has or is currently living with a
disability?**

**Participants needed
for study**



A study examining the barriers encountered by undergraduate medical students with disabilities.

Looking for 8 – 12 participants fitting the following criteria:

- **Current or previous undergraduate medical student at the Northern Ontario School of Medicine**
- **Currently or previously living with a disability that affects or has affected your undergraduate medical education for 6 months or longer**
 - **Ex: Physical, sensory, learning, psychological, motor, neurological disabilities including concussions, traumatic injuries, permanent disabilities, chronic illness, and mental health**

Participation will involve an interview session lasting approximately 1 hour.

\$10 Gift card will be provided

Contact Rachel Belanger
MSc. Student
School of Rural and Northern Health
Laurentian University
rbelanger3@laurentian.ca



Northern Ontario
School of Medicine
École de médecine
du Nord de l'Ontario
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Ethics approval obtained from Lakehead University and Laurentian University

APPENDIX C: Sample Letter of Information and Consent Form



Dear Potential Participant,

My name is Rachel Belanger and I am a Masters' of Science student in the Interdisciplinary Health program with Laurentian University's School of Rural and Northern Health. I am inviting you to participate in my research project titled "The Good Student or the Good Patient? The Barriers Encountered by Undergraduate Medical Students at the Northern Ontario School of Medicine". In performing this research, my goal is to learn about the experiences of medical students with disabilities, to provide a voice for your story and to hopefully establish a baseline to then establish solutions to eliminate some of these barriers. Taking part in this research is voluntary. Please read this letter carefully to understand what is involved. After you have read this letter, please contact the researchers about any questions you may have.

You have been asked to participate in this research because you are currently or have previously been an undergraduate medical student at the Northern Ontario School of Medicine living with a disability, whether or not you disclosed this disability to the medical school. For this research, a disability is defined as an impairment leading to limitations or restrictions occurring in day to day life and refers to a wide range of impairments that include but are not limited to physical, sensory, motor, neurological, psychological and learning disabilities for a period of 6 months or longer. Should you choose to participate in this research, I will disseminate a summary of the results to you to ensure I have captured your experience before writing a written report. I then plan to present the study results at conferences, in journal publications and hopefully to the Northern Ontario School of Medicine. Results from this study will be used to compare the experiences of students living with disabilities at the Northern Ontario School of Medicine to students at American medical schools and other Canadian medical schools. Additionally, we hope this research will help improve the inclusivity of students with disabilities in medical school and other health care professions. We recognize that this is a psychologically taxing experience and may bring up difficult emotions and memories but hope that sharing these experiences will aid us in coming up with solutions to eliminate some of the barriers that do currently exist.

Participation in this study is completely voluntary and should you choose to withdraw at any time, you may do so without consequence by contacting myself or my supervisor, Dr. Elizabeth Levin. I will collect information by initially providing you with a demographics-based questionnaire to be filled online using google forms, followed by individual interviews done in person, via Skype or by telephone, whatever is most convenient to you. Interviews are expected to last 60 to 90 minutes and should you want to follow up at a later date, this is possible. Your identity will be kept confidential for the entirety of this project. Please note that while we will not disclose any of your identifying information, that due to the small community of the Northern Ontario School of Medicine and the small population of students with disabilities, that this may lead to individuals linking results to you, should you choose to disclose your specific

disability or type of disability, but will be provided the option to withhold information about your specific disability. Participation in this project will have no impact on your grades, class standing, or academic status and personal information will not appear on any documents. You will be provided with a copy of the interview transcript to ensure your experiences are captured appropriately and can be modified should you want to make any changes. Following analysis of interviews, you will be provided with a one-page summary of results and should you want a copy of the full report upon completion, it shall be provided to you.

If you have any questions, concerns, or feedback about this research, please feel free to contact me, Rachel Belanger, by e-mail at rbelanger3@laurentian.ca or contact my supervisor, Dr. Elizabeth Levin, by email at elevin@nosm.ca, or by telephone at (705) 675-7520. This research has been approved by Laurentian University and Lakehead University, the two universities governing the Northern Ontario School of Medicine. If you have further questions or questions about the ethical conduct of this research, you may contact the Ethics Research Officer at Laurentian University by telephone at 705-675-1151 or 1-800-461-4030, extension 3213, or by email at ethics@laurentian.ca. To contact the Research Ethics Board at Lakehead University, you can contact Sue Wright at 807-343-8283 or research@lakeheadu.ca

I would appreciate it if you would consent to participate in this research study. If you would like to participate in this study, please fill out the attached form and return it to the sender by e-mail. To thank you for your participation and your time, I will provide you with a ten-dollar gift card.

Sincerely,

Rachel Belanger, MSc. Student
School of Rural and Northern Health or
Laurentian University
rbelanger3@laurentian.ca

Elizabeth Levin, PhD
Northern Ontario School of Medicine
(705) 675-7250 or 1 (800) 461-4030 ext. 4242
elevin@nosm.ca



Study Title: The Good Student or the Good Patient? The Barriers Encountered by Undergraduate Medical Students with Disabilities at the Northern Ontario School of Medicine

Principal Investigator and Supervisor:

Dr. Elizabeth Levin, PhD, Division Head, Human Sciences, Northern Ontario School of Medicine

Student Researcher:

Rachel Belanger, MSc Student, School of Rural and Northern Health, Laurentian University

As a participant, you understand that:

- You have read and understand the information contained in the information letter and understand the risks and benefits of this research
- You may withdraw your participation at any time and participation is voluntary
- You will participate in an audio recorded interview
- You do not have to answer all questions and you will still receive your incentive should you choose not to answer all questions
- Your information will be kept confidential, secure and your identity will be protected and remain anonymous.
- Data will be kept in a locked filing cabinet in Dr. Elizabeth Levin's office. Electronic files will be password protected and kept within a password protected computer for a minimum of 5 years.
- You will be provided with a summary of results following the completion of this study
- This research will in no way affect your grades for academic classes or clinical placements, class standings or any other aspect of being an undergraduate student at the Northern Ontario School of Medicine
- You will keep a copy of this consent form and will provide me, the principal researcher, with a signed copy. Consent forms will be kept in a locked filing cabinet at the Northern Ontario School of Medicine
- All of your questions regarding this research have been answered

For the purpose of written reports and the fact that specific barriers arise with specific types of disabilities, may we refer to your specific disability or type of disability in written results, discussion and reports? Please note that while we will not disclose any of your identifying information, that due to the small community of the Northern Ontario School of Medicine and the small population of students with disabilities, that this may lead to individuals linking results to you, should you choose to disclose your specific disability or type of disability.

Refer to my specific disability

Refer to my type of disability (i.e. physical, psychological, learning, neurological, sensory, etc.)

Please abstain from referring to details of my disability

By consenting to participate, you have not waived any rights to legal recourse in the event of research-related harm.

In signing this consent form, you agree to participate in this research. You have been provided with a letter of information about the research as well as a copy of the consent form.

Participant's Name: _____ Date: _____

Participants' Signature: _____ Date: _____

If you would like to receive a summary of results, please provide one or both of the below:

Email address: _____

Mailing address: _____

Would you be willing to speak about your experiences at a later time, if applicable (i.e. higher year, residency, as a practicing physician)? Please check yes or no

Yes

No

Appendix D - Initial Survey and Semi-structured Interview Protocol



The following interview protocol was adapted from that used for the Lived Experience Project (Meeks & Jain, 2018) with the permission of the authors.

Interview Protocol

Step 1: Potential interviewees will be contacted via email, through NOSM's Learner Affairs newsletter, to gauge their interest in participating in the project. This e-mail will include the letter of information for the research project and the recruitment poster. Students will also be recruited by posters shared through the social media platform, Facebook. If interested, participants will be asked to contact the student researcher, Rachel Belanger, at her Laurentian University e-mail address, rbelanger3@laurentian.ca.

Step 2: For those interested, a consent form will be sent to participants along with a link to a Google forms survey to be completed that will include basic demographic information (e.g., gender, age, disability type and ethnicity) and general questions about their education and their disability. This will be sent to the e-mail by which students contact the student researcher to express interest in the project. Through the Google forms survey, interviewees will also select a preferred week (ranking by preference) for their interview. They will select their preferred method of interview (phone, video conference, or in-person), as well.

Step 3: Participants that have signed and returned the consent form and completed the Google forms survey will be contacted to finalize a date and time for the semi-structured interview. Before the interview begins, verbal consent will be obtained from participants.

Demographic and Initial Survey Collection

- Pseudonym for Interview Transcripts:
- Date of Birth:
- Gender:
- Ethnicity
- Do you have any other graduate degrees (e.g., MBA, MA, MSc)? (text box)
If yes, where? (text box)
- What year did you start medical school? (text box)
- How old were you when you started medical school? (text box)
- Current level of training
 - Year in medical school -check box
 - Have you disclosed your disability during medical school?
 - If yes, when did you first disclose it?
- Did you use accommodations in any of the following? (K-12, college, university, medical

- school, employment, other degree, MCAT) - check box
- Disability categories (check as many as apply):
 - (AD/HD),
 - learning disability,
 - psychological disability,
 - deaf or hard of hearing,
 - visual disability,
 - mobility disability,
 - chronic health condition,
 - other (specify)
 - May we disclose your specific disability or type of disability in written reports? (yes or no).
 - Specific Disability: yes or no
 - If no, Type of Disability: yes or no
 - *Please note that while we will not collect or disclose any of your personal information, that identification of your disability may lead to individuals identifying your person due to the small nature of NOSM's community and the small population of medical students with disabilities
 - Describe your disability in 2-3 sentences (text box)
 - When were you first diagnosed with a disability (age/grade)?
 - Will you require any accommodations to participate in this study? Y/N
 - Y: Please let us know the accommodations you will require (Text box)
 - Free response: ^[1]_[SEP] Is there anything you would like the investigators to know in advance of your interview?

Interviews:

Interviews will be held in person, via Skype or by telephone depending on your preferred method of contact.

Please rank your preferred method of interview with 1 indicating your first choice.

_____ Skype _____ In Person _____ Telephone

Interview Questions

ID #: _____ Chosen Pseudonym: _____

Date of Interview:

Interview type:

_____ Skype _____ In Person _____ Telephone

Opening/Introduction

Hello, my name is Rachel and I am a Masters' of Science Student with Laurentian University's School of Rural and Northern Health in the Interdisciplinary Health Program. I would like to

thank you for your participation today. I understand the sensitive nature of some of the questions today and should you feel like you would like to stop at any time, please let me know. Please feel free to ask me for any clarifications or if you would like me to repeat a question. Take as long or as little time as you would like to answer any questions or if you would like to skip a question. Do you have any questions before we begin the interview? Before we begin, I'd also like to obtain verbal consent for your participation in this research. Are you able to provide that?

Interview Questions

Opening Questions

- What made you want to become a doctor? Did you anticipate any barriers to becoming a doctor?
- I see from your survey that you were diagnosed at _____; can you tell me about that experience?
- How do you identify yourself (if you were to describe yourself how would you do this?) example: Identify as female, daughter of immigrants, ex-pat.

Medical School Experience

- Tell me about your medical school experience
- Probe for:
 - a) Admissions process b) 1st year experience
- Tell me about your decision to attend the Northern Ontario School of Medicine
 - What was it based on?
 - Was disability a factor?
 - If so how? (E.g. “disability friendliness,” accessibility of campus, ^[SEP]understanding of recruiter/interviewers, etc.) Did you experience any barriers related to your disability? Physical? Curricular? Attitudinal? Differences between pre-clinical and clinical years
 - Did you have any academic difficulties in medical school?
- Tell me about your transition into the clinical years
- Did you have any supportive factors in your medical school experience? Where they formal or informal supports? E.g., programmatic supports (i.e., formal supports like a formal mentoring program, DS office), Informal mentoring, other individuals with disabilities, etc.
- What kind of supports did you engage with during your medical program? Were they helpful? (E.g., Tutoring, Learning Resources, Counseling, First Gen resources, LGBTQ resources, Disability Services, Mentors).
- How were you supported in rural placements in Northern Ontario?
- I see that you (did/did not) use of accommodations in medical school, can you tell me what lead to that decision?
- Tell me about your experience using/not using accommodations: Who determined what accommodations you would receive? Was this person knowledgeable? How was the request process for you?
- Were the faculty responsive to your needs? How did accommodations affect the barriers that exist for you?

- Did you self-accommodate or have creative strategies for meeting your programmatic/patient needs?
- Were others at the med school aware of your status as an individual with a disability? (e.g. peers, friends, faculty)
 - If yes: how did they find out?
 - ○ Self-disclosure
 - ○ Unapproved/Inadvertent disclosure by school
 - ○ Disclosure through use of accommodations
 - If no: What influenced that decision?
- Tell me about your experience applying for accommodations on the MCCEE licensing exams (note whether or not accommodations were used) – if relevant
- Did you have assistance applying for accommodations?
- Did you have to take exams more than once?
- Tell me about your experience with the match process. – if relevant
- How did you choose your specialty? - if relevant
- What (if any) kind of counseling did you receive around choosing a specialty? – if relevant
- What was (is) most challenging about medical school? Was (is) it disability related?
- In a perfect world, tell me about the supports, resources, or accommodations that would have positively impacted your experience in medical school.
- Is there something else I should know about your time in medical school?

Closing questions

- Do you feel you have been discriminated against as a person with a disability at any point of your training and employment?
 - **If yes**
 - how?
 - What was the source, what was your experience?
 - Did you file a complaint?
- What do you think are the most important contributors to your success as a physician with a disability?
- What advice would you give to an aspiring physician with a disability? Is there something else about your experiences you want me to know? Is there a question you wish I had asked? Is there anything you would like to ask me?
- Are you willing to be interviewed in a subsequent year?