Title: The quest for greater equity: A national cross-sectional study of the experiences of Black Canadian medical students

Authors: Mathieu, Johanne MD; Akinbobola, Kikelomo MD; Shipeolu, Lolade MD; Crosse, Kien MD; Thomas, Kimberley MSc; Denis-LeBlanc, Manon MD; Fotsing, Salomon MD; Bekolo, Gaelle MD

Affiliations:

J. Mathieu is an alumna of the undergraduate medical program at the University of Ottawa, and a current resident in the Ophthalmology program at the University of Sherbrooke, Sherbrooke, QC.

K. Akinbobola is a family medicine alumna of the University of Ottawa and practicing family physician at the Royal Columbian Hospital, New Westminster, B.C

L. Shipeolu is an alumna of the undergraduate medical program at the University of Ottawa, and a current resident in the Obstetrics and Gynecology program at University of British Columbia, Vancouver, B.C.

K. Crosse is an alumnus of the undergraduate medical program at the University of Ottawa, and a current resident in the Psychiatry program at the University of Toronto, Toronto, ON

K. Thomas is a medical student at the Faculty of Medicine of the University of British Columbia and Western regional director of the Black Medical Student's Association of Canada (BMSAC).

M. Denis-LeBlanc is a family physician and Vice Dean Francophone Affairs at the Faculty of Medicine of the University of Ottawa, Clinical Researcher at the *Institut du Savoir Montfort*, Ottawa, ON.

S. Fotsing is lecturer in the Department of Family Medicine at the University of Ottawa and Research Manager in Medical Education at the Francophones Affaires, Faculty of Medicine, University of Ottawa, Ottawa, ON.

G. Bekolo is a practicing family physician in the Department of Family Medicine of Montfort Hospital, Black Health Leader within the Department of Undergraduate Medical Education of the University of Ottawa, Ottawa, ON.

Correspondence should be addressed to Johanne Mathieu; e-mail: jmath076@uottawa.ca

Correspondence may also be addressed to the principal investigator of the study Gaelle Bekolo; e-mail: gaellebekolo@montfort.on.ca

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Data about the compositional diversity of Canadian medical schools is limited, however, the few studies available report a common observation: Black medical students are disproportionately underrepresented compared to other minority groups(1,2). In their 2020 cross-sectional study on Canadian medical faculties, Khan et al reports that Black individuals represent 1.7% of the medical class(1), in contrast to 6.4% of the national population of comparable age. Canadian universities and the Association of Faculties of Medicine of Canada have not consistently documented the ethnocultural background of medical school applicants and matriculants(2). Without these demographical data and trends, there exists challenges with identifying the systemic and intersecting factors that interplay with the underrepresentation of Black students in medical education as well as understanding their experiences and differential outcomes (3).

In their qualitative study on underrepresented Black, Hispanic and Native American residents from 21 residency programs, Osseo-Asare et al describes that minority trainees face pervasive discrimination, experience feelings of 'otherness' and lack in mentors(4). They also described being burdened with promoting diversity in their institutions, often at the expense of traditional scholarly work more highly esteemed in academia - a phenomenon coined 'minority tax' in prior literature(5,6). In one longitudinal study on discrimination set in an undisclosed Canadian medical faculty, Black and other ethnic minority medical students reported experiencing daily microaggressions from peers and social isolation(7). Students often did not report instances of discrimination due to fears of having their claims dismissed or lacking access to appropriate institutional support(7,8). The limited availability of data on Black students' experiences does not mean disparities, discrimination and systemic exclusion are absent from Canadian medical faculties(9,10). Henry et al's landmark study on the experiences of racialized faculty in Canadian

academia highlighted that universities reproduce the accepted social hierarchy where non-White minority are excluded and marginalized(11).

Developing institutional frameworks that address racism tailored to the Canadian context requires filling the knowledge gaps about discrimination among racialized medical students. Currently, the characterization and collective experience of Black medical students across Canada has not yet been reported in literature. In this study, the research questions are: *Do Black medical students in Canada face discrimination in medical education? If so, what are these experiences?* As Canadian medical schools devise strategies to diversify their student body, understanding the experiences of Black students in medical education is paramount to fostering a culture of inclusion and equity, while eliminating institutional barriers to their advancement and livelihood.

METHOD

Study setting and population

There are 17 Canadian faculties of medicine usually divided into four geodemographic regions: Ontario, Quebec, Atlantic and Western. Together, these faculties train approximately 10,000 medical students(12). The number of self-identifying Black medical students and trainees across Canadian medical schools is currently unknown. The Black Medical Association of Canada (BMSAC), a non-profit student-led organization, was founded in November of 2019 with the mission of unifying, supporting, and fostering equitable representation of Black students in Canadian medical schools(13). At the time of our study, the association had 128 active members. Membership to the BMSAC is inclusive to all self-identifying Black medical students and this association is estimated to include the majority of Black medical students in Canada(13).

Study procedure

This is a cross-sectional, descriptive study using an online, anonymous, and self-administered questionnaire. The recruitment material and SurveyMonkey® link were sent to the BMSAC for dissemination through listserv. Data collection occurred from January 12th, 2021 to March 11th, 2021. A snowball sampling method was used to further optimize recruitment. The eligibility criteria included: (1) Self-identifying as Black and (2) Being a medical student enrolled at a Canadian faculty of medicine or a first-year resident who completed medical school at a Canadian faculty in 2020. First-year residents were included in the cohort of participants given their recent completion of all 3 or 4 years of medical school and given that most of their experience in medicine could still be attributed to their undergraduate medical studies at the time of questionnaire dissemination.

Instrument design

The content of the questionnaire was adapted from validated questionnaires exploring minority students and faculty member' perceptions of the medical school environment in the United-States and United Kingdom(4,14,15). Our questionnaire was reviewed by a multidisciplinary group of professionals, including a social scientist. It included 63 questions that began with exploring sociodemographic data and then five domains of interest, which are outlined below. Participants were asked to select/declare their ethnocultural origin; "race" and "ethnocultural identity" were used interchangeably in our study. Other demographic data included respondents' gender identity, native language, year of study and the geographic region of their medical school. We used household income during the second decade of life as a direct indicator of socioeconomic status. For the five subsequent domains of interest, the questionnaire was divided into the

following sections: (1) Inclusion and diversity, (2) Wellness, (3) Discrimination, (4) Career advancement, and (5) Diversity responsive medical education. The quantitative online questionnaire was comprised of dichotomic closed-ended questions (yes or no) as well as closed-ended questions with 6-point Likert scales. Prior to dissemination, we piloted the questionnaire with non-participants to assess survey response process and clarity.

The work presented in this article forms the quantitative part of our mixed-methods study on the experiences of Black medical students in Canada. The qualitative phase of the study will be presented at another date and will provide further understanding on the lived experiences of our study population.

Data analysis

Guided by our literature review, we regrouped items of our questionnaire in distinct semantic dimensions designed to reliably assess various components of minority experience in medicine and guide our final data analysis. We ran an exploratory factor assay and Cronbach α reliability analysis to redefine our survey domains. We only kept dimensions or grouped questions that demonstrated good reliability with a Cronbach α coefficient higher than 0.7 (**table 1**). Descriptive data analysis consisted of frequencies for each reliable dimension or independent item responses. Inferential analysis was performed with Chi-square to identify any correlations between sociodemographic variables and calculated scores of reliable domains and individual items. Statistical analyses were performed in collaboration with an independent biostatistician using SPSS software version 25 (IBM SPSS Statistics, Amronk, New York).

Table 1 Statistical characteristics of survey dimensions' impact of minority status amongst Black medical students

Reliable domains and item description	Number of items	Cronbach α
Academic inclusion Feeling welcomed in faculty, Ease to make friends in medical school, Able to create strong friendships in medical school, Ethnicity as a barrier to fit in with peers (R)[a].	5	0.751
Clinical inclusion Ethnicity as a barrier to feel welcomed by preceptors (R), Ethnicity as a barrier to fit in medical team (R), Ethnicity as a barrier to feel welcomed by patients (R).	3	0.893
Discrimination Reported incident(Y/N)[b], Sought institutional support(Y/N), Received institutional support(Y/N).	3	0.847
Resilience Impact of discrimination by peer or medical personnel on confidence (R), Impact of discrimination by peer or medical personnel on career advancement (R), Impact of discrimination by patient on confidence (R), Impact of discrimination by patient on career advancement (R).	4	0.780
Wellness Increasing negative feelings regarding clinical work or school (R), Feeling drained in clinic or at school (R).	2	0.775
Career advancement Discrimination seen as a barrier to professional success (R), Discrimination seen as a barrier to professional satisfaction (R), Perceived academic performance, Refused opportunities because of ethnicity (R), Evaluations impacted by ethnicity (R), Mentorship opportunities impacted by ethnicity (R), Facilitated mentorship with concordant ethnicity (R), Acquiring letters of recommendations impacted by ethnicity (R), Speciality choice impacted by ethnicity (R), City of training impacted by ethnicity (R).	10	0.821
Minority tax Pressure to work more than peers (R), Tasked to find solutions for diversity (R), Tasked to serve minority patients (R), Tasked to respond to questions related to minorities (R), Pressure to be a minority ambassador (R), Pressure to dedicate more time to equity causes than peers (R), Consecrates more time than peers to equity causes (R), Closer ties to minority peers (R), Professional development time impacted by equity causes (R).	8	0.878
Diversity in Medical Education Class perceived as ethnoculturally diverse, Class perceived as diverse (not including ethnicity), Available faculty program promoting diversity, Faculty promotes diversity in curriculum and composition, Curriculum responsive to clinical ethnocultural factors.	5	0.814

[a](R) = Reverse coded question
[b](Y/N) = dichotomic question to which the answer can be yes or no

Ethics

Ethics approval was granted by the Health Sciences and Sciences Research Ethics Board of the University of Ottawa on January 2, 2021. ID#: H-08-20-5969.

RESULTS

Demographics

We received a total of 52 responses from our sample population of 128 active BMSAC medical student members (39.8% response rate) (**Table 2**). The survey was completed by respondents that represented all four geodemographic regions (Ontario, Quebec, Atlantic and Western), including 13 of all 17 Canadian medical schools. Our response sample had representation across all eligible years of study. Most respondents self-identified as women (75%) and 25% as men. Due to the unique scholar path and low sample size of MD/PhD students, their data was excluded from analysis.

About 96.1% of respondents self-identified as Black and 3.9% as mixed Black. Majority of respondents reported that while growing up, their parents' gross income was middle to high (above poverty line of $37,542.00 per year) (**figure 1**). In other words, majority of respondents did not come from a low-income family.

Academic and Clinical Inclusion

69.4% (34/49) of participants responded positively to survey questions and statements ascertaining their perception of medical school belonging—agreeing that they belonged in their medical school community (**figure 2**). Similarly, 66.7% (32/48) of the responses indicated that they felt included or integrated into the medical team of their clinical settings.

Table 2. Socio-demographic and professional characteristics of surveyed Black medical students in Canadian medical institutions, n = 52

Characteristic	n (%)
Demographics	
Gender	
Female	39 (75%)
Male	13 (25%)
Native language (n = 51)[a]	
English	28 (54.9%)
French	14 (27.5%)
Other	9 (17.6%)
Academic demographics	
Geographic region of attended medical school	
Ontario	28 (53.8%)
Quebec	11 (21.2%)
Western	9 (17.3%)
Atlantic	4 (7.7%)
Learner academic level	
First year medical student	12 (23.1%)
Second year medical student	12 (23.1%)
Third year medical student	13 (25%)
Fourth year medical student	7 (13.5%)
First year resident	7 (13.5%)
MD/PhD medical student	1 (1.9%)
Ethnocultural identity	
Self-reported identity (n = 51)[a]	
Black	49 (96.1%)
Mixed Black	2 (3.9%)
Ethnicity	
Monoethnic Black	
African	15 (28.8%)
Afro-Canadian	9 (17.3%)
Afro-Caribbean	4 (7.7%)
Black Nova Scotian	1 (1.9%)
Multiethnic Black[b]	12 (23.1%)
Multiethnic Mixed Black[c]	11 (21.2%)

[a]There are discrepancies in sample size with certain questions when participants provided no response or declined to answer.
[b]As opposed to monoethnic black, individuals that are multiethnic Black identify with multiple groups of African descent
[c]Multiethnic mixed black refers to individuals that identify with at least one other non-black ethnocultural group

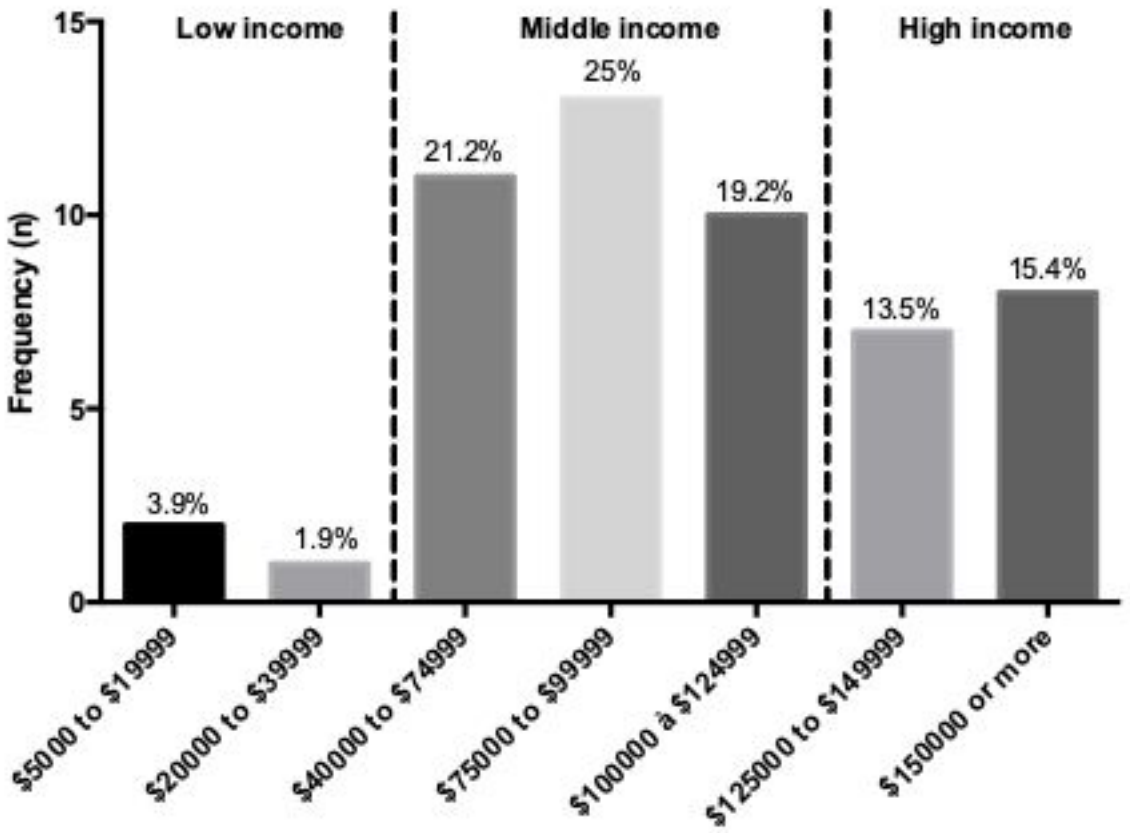

Figure 1 Parental income distribution of surveyed Canadian Black Medical Students, n = 52
The threshold for 'low income' was approximated to 40,000$ and for 'high income' to 125,000$ annual gross salary of the respondents' household during youth. As shown by the graph, most Black medical students come from middle to high socio-economic class.

Discrimination

58.8% (30/51) of participants responded "Yes" to having experienced discrimination in medical school (**table 3**). The majority of these incidents were perpetuated by a "patient" or "student/resident or peer", followed by "hospital staff physician, nurses or preceptors". Most students shared these experiences with their student peers (80.8%, 21/26). Moreover, a majority of students did not report these incidents: 30.8% (8/26) reported seeking institutional support and 27.3% (6/22) of participants reported receiving intuitional support (**table 3**). 76% (19/25) of respondents who experienced discrimination in medical school had negative experience with reporting incidents (**figure 2**).

The Chi-square analysis showed a significant association between the years of study in medical school and rates of discrimination —in other words, more participants in clerkship-years' reported experiencing discrimination than those in their pre-clerkship years [X^2 (4, N=49) =17.939, p=0.001] **(Appendix 1, available at _)**. When analyzed by region, the Chi-square test indicates that there is a significant difference between the different regions (I.e., Quebec, Ontario, Atlantic and Western) and their proportion of students receiving institutional support for discrimination. Atlantic region respondents reported the highest proportion of institutional support. Ontario and Western reported a higher proportion of students not receiving institutional support for discrimination. Quebec respondents had the highest proportion of negative responses pertaining to receiving institutional support for racial/ethnic discrimination [X^2 (3, N=22) =9.612, p=0.032 (**Appendix 1**).

Table 3. Surveyed Black medical students' experiences with discrimination in Canadian medical school

	Response	n (%)
Dealing with experiences of discrimination		
Student experienced discrimination in medical school (n = 51)	Yes	30 (58.8%)
	No	19 (37.3%)
	Did not answer	2 (3.9%)
Student shared experience with other student peers (n = 26)[a]	Yes	21 (80.8%)
Institutional support		
Student sought institutional support (n = 26) [a]	Yes	8 (30.8%)
Student received institutional support (n = 22) [a]	Yes	6 (27.3%)
Quality of institutional support (n = 8)[b]	Poor	2 (25.0%)
	Fair	3 (37.5%)
	Good	3 (37.5%)
	Very Good	0 (0%)
	Excellent	0 (0%)
Actors by which students report experiencing discrimination from (n = 26) [a]		
Patient		13
Student peer or resident		11
Professor or lecturer		6
Hospital staff (staff physicians)		6
Preceptor		5
Hospital staff (nurses)		5
Hospital staff (allied health)		3

NB: The sample size varied in function of non-respondents or non-applicable participants with certain questions (ex. Only students that answered 'yes' to having experienced discrimination could answer the ([a]) marked prompts and only students that received institutional support could answer the ([b]) prompts.). This question was also multiple choice, meaning the total n is greater than the number of respondents.

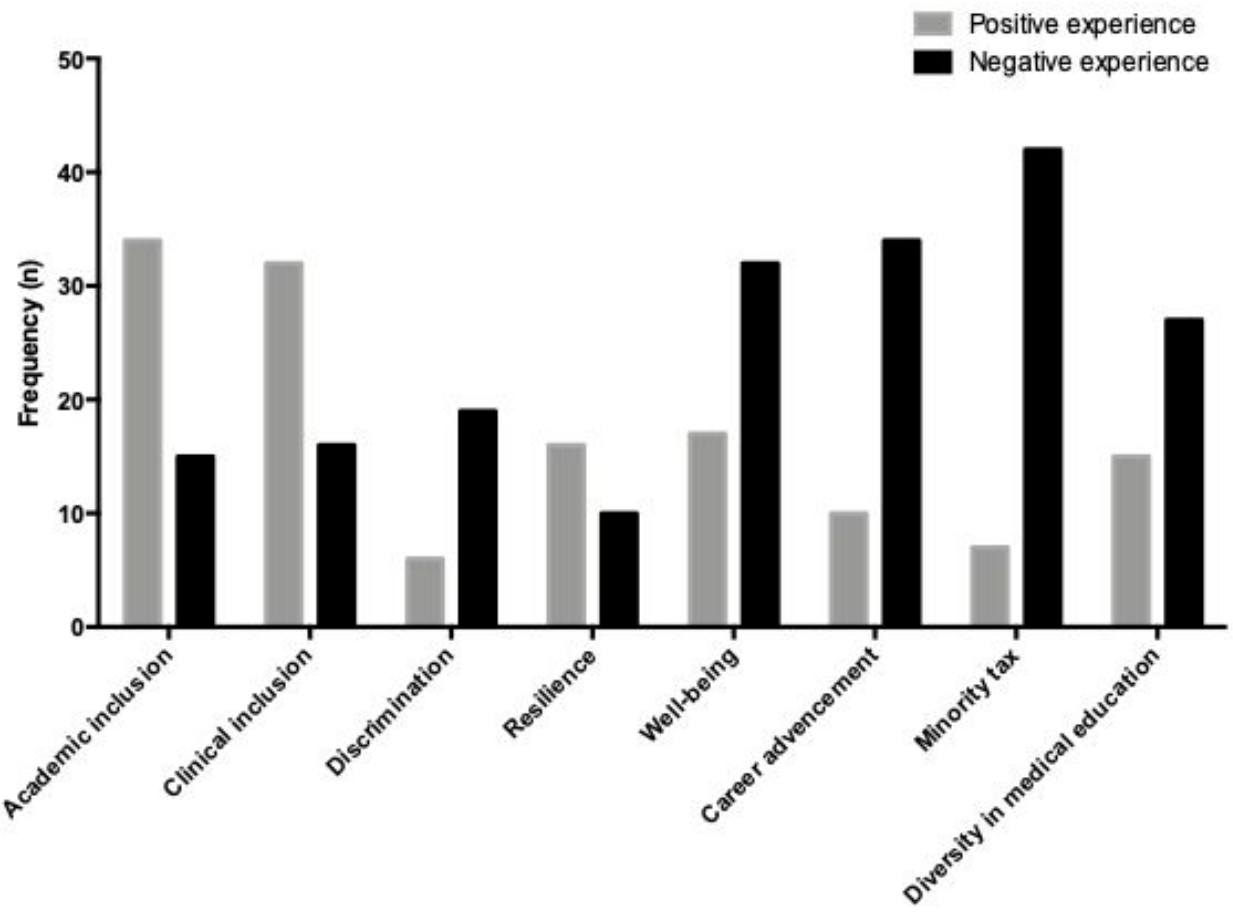

Figure 2 Frequency distribution of Black medical students' perceptions and experiences in Canadian Medical Schools by survey dimensions, n=51.

Answers were graphed by frequency of positive (gray) or negative (black) responses. Six-point Likert scale were grouped as negative if coded between 1 (strongly disagree) to 3 (Disagree), and as positive if coded between 4 (agree) to 6 (strongly agree). The Resilience and Discrimination survey domain had a lower sample size (n=26) due to experience with discrimination being a prerequisite to respondents answering these specific questions. Overall, we can visualize academic inclusion, clinical inclusion, and resilience to have positive responses whilst all other domains were reported to be experienced as negative by survey participants.

Resilience

61.5% (16/26) of the respondents endorsed resilience statements when describing how they dealt with racial discrimination (**figure 2**). In other words, most respondents agreed that their confidence or career advancement as a medical student were not negatively impacted despite experiences of discrimination

Wellness

65.3% (32/49) of respondents indicated that their well-being was poor in medical school, agreeing with statements that elicited symptoms of burn-out in themselves (**figure 2**).

Career Advancement

Majority (79.5%, 35/44) of respondents agreed with statements that reported race/ethnicity negatively impacting their career advancement (**figure 2**). The proportion of Black medical students who reported that being Black had a negative impact on their career advancement decreased from first year to fourth year [X^2 (4, N=41) =10.486, p=0.034] **(Appendix 1)**. In other words, a higher proportion of third- and fourth-year medical students agreed with statements that indicated being Black did not have a negative impact on their career advancement.

Minority Tax

Most (85.7%, 42/49) participants agreed with statements that the phenomenon of 'minority tax' was regarded as a negative experience (**figure 2**). Also, a higher proportion of female respondents compared to males agreed with such statements o [X^2 (1, N=49) =5.754, p=0.029] **(Appendix 1)**.

Diversity in Medical Education

64.3% (27/42) of respondents endorsed negative responses for questions asking whether they found their medical school faculty or medical curricula to be diverse in its representation (**figure 2**).

Interpretation

Our findings show that Black medical students are significantly affected by discrimination while training in Canadian medical schools. To date, little is known about the experiences of racism amongst Black medical students in Canada and our study contributes to addressing this knowledge gap. In our survey, a majority of reported personal encounters with discrimination were experienced in both clinical and academic contexts, most notably from patients, peers, and hospital staff. Students further along in their training were more likely to endorse having experienced discrimination in medical school, showing a positive correlation between years in undergraduate medical education and exposure to discrimination. Respondents were more likely to report these negative experiences to peers rather than reporting to faculty or seeking institutional support. Only 1 in 3 respondents that experienced interpersonal discrimination reported incidents to their medical school and even fewer sought out and received requested support. Although most respondents reported feeling included in their social interactions within clinical and academic settings and being resilient in the face of discrimination, our study results highlights that most Black medical students harbor negative experiences regarding reporting discrimination, their own wellness, their career advancement, feelings of being 'taxed' as a minority and a lack of diverse representation in faculty and in curricula. These marginalized experiences of Black medical students as well as the

pedagogical practices and perpetuation of inequity through inconsistent support are suggestive of institutional racism. As defined in Sir William Macpherson's Stephen Lawrence report: «[Institutional racism is] the collective failure of an organization to provide an appropriate and professional service [and it is] detected in processes, attitudes and behaviour that amount to discrimination through unwitting prejudice, ignorance, thoughtlessness, and racist stereotyping which disadvantage minority ethnic people»(16).

Many of our findings are consistent with prior studies about systemically excluded minority groups in medical education. Mpalirwa et al's 2020 qualitative study about Ontarian Black residents and physicians found that over 70% of respondents experienced mistreatment from patients, peers, and preceptors, and this confirms our finding that exposure to racism begins early in medical training and persists throughout training. Other studies outside of Canada similarly indicate that Black and minority ethnic medical students are unlikely to report discrimination, as reporting is perceived to be ineffective and victimizing(8). This suggests that medical school administrators may be unaware of interpersonal racism experienced by their students and, paradoxically, the denial of these negative experiences renders them ill-equipped to properly support affected students. Moreover, in their review of 28 studies on underrepresented minorities in medicine, Orom et al describe that minority students were more likely to experience discrimination, have poorer self-esteem, have a smaller social network and have more difficulties finding mentors than their white counterparts(17). If left unaddressed, this adverse learning climate will continue to entrench attainment gaps in medical education and advancement amongst underrepresented minorities.

Traditionally, excellence has been a unifying framework in academic and medical communities; now more than ever, it becomes important to integrate social accountability within the narratives of excellence, with the goal of ultimately aligning excellence with societal outcomes(18,19). As faculties continue to expand their equity practices beyond antidiscrimination policies, mitigating the occurrence and impact of discrimination requires a comprehensive antiracism plan involving all key actors(11). This could include antiracism training for faculty, non-stereotypical diversity representation in curriculum and the creation of an institutional service dedicated to addressing inequity complaints while promoting equity. Finally, disrupting inequities also requires a review of inaccurate use of "race" as a biological entity in medicine and academia(20). The consistent use of race as a social construct, would allow a better understanding of racism as risk factor stemming from the individuals' relation to societal norms and not from within the individual, themselves(21).

Limitations

There is currently no accurate estimate of the number of current Canadian Black medical students, therefore, the response rate and representativity of our sample population remains unknown. Further, the quantitative nature of this study limits our understanding of the experiences of Black medical students. There is a need for more qualitative research characterizing the discrimination lived by these students – this will be further explored in the subsequent phase of our study. This study is also only the first step towards validating our multidimensional instrument although it already has shown robust reliability for its domains with Cronbach α above 0.7. Even more, there is a pressing need for additional robust research that will identify and address inequities for underrepresented minorities in medical education.

Conclusion

Our study highlights the experiences of discrimination faced by Black medical students in Canada during their undergraduate medical training, and our findings directly challenge the conception that Canadian medical schools are impervious to racism. As we move toward enhancing equity and inclusivity in Canadian medical education, academic institutions must commit to bringing awareness, and creating sustainable systemic changes through multidimensional and interdisciplinary anti-racist approaches.

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Appendix 1 Correlational studies between sociodemographic characteristics and Black medical student experiences in Canadian medical schools.

	Negative experience	**Positive experience**	Chi-squared χ^2	p-value [a]
Minority tax (n = 49)				
Minority tax : Gender				
Female (n = 37)	2	35	9.730	0.007
Male (n = 12)	5	7		
Minority tax : Year of study				
First year (n = 10)	2	8		
Second year (n = 12)	2	10		
Third year (n = 14)	0	14	10.072	0.034
Fourth year (n = 6)	3	3		
PGY1 (n = 7)	0	7		
Student has experienced discrimination: no/yes (n = 49)				
Discrimination : Year of study				
First year (n = 10)	2	8		
Second year (n = 12)	5	7		
Third year (n = 14)	10	4	17.939	0.001
Fourth year (n = 6)	6	0		
PGY1 (n = 7)	7	0		
Student has received institutional support when reporting discrimination: no/yes (n = 22)				
Institutional support : Location				
Atlantic (n = 3)	0	3		
Ontario (n = 10)	8	2	9.612	0.032
Quebec (n = 2)	2	0		
Western (n = 7)	6	1		
Career advancement (n = 41)				
Career advancement : Year of study	9	0		
First year (n = 10)	8	1		
Second year (n = 12)	12	1	10.486	0.034
Third year (n = 14)	2	3		
Fourth year (n = 6)	4	1		
PGY1 (n = 7)				

[a]p-value considered significant if below 0.05. Only the domains that showed significant results are shown in this table. Chi-square analysis between our survey domains and other demographics (ethnocultural identity, native language) did not show any significant correlation.