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Surveying Barriers to Accessibility Experienced by People with Disabilities in Canada and Quantified Impact on Perceived Quality of Life

Analyse des obstacles à l’accessibilité rencontrés par les personnes handicapées au Canada et impact quantifié sur la qualité de vie perçu

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Abstract

Purpose: People with disabilities may experience social or physical barriers in their built environment daily. These barriers often contribute to decreased quality of life (QoL). The purpose of this study was to describe current challenges in accessibility for people living with disabilities in Canada and the impact of these on their QoL. *Materials and Methods:* A

survey (online/telephone/mail back) was conducted with individuals identifying as having a disability. Survey questions were focused on one’s experiences with accessibility barriers in five priority areas (built environment, employment, customer service, information and communication, and transportation). *Results:* A total of 308 individuals participated in the survey. Of the five priority areas, the built environment was reported as the greatest barrier to QoL and information and communication standards and technology had the least impact on QoL. Most reported barriers included the presence of stairs, lack of awareness of disability and ability to provide employment accommodations, issues with presentation of media and text, and transportation service availability. *Conclusions:* The findings highlight the most frequent barriers impacting one’s QoL for people with disabilities, which include the built environment and transportation challenges. This knowledge is crucial to enhance policy intervention and guidance for accessibility infrastructure in the future.

Résumé

Objectif : Les personnes handicapées peuvent rencontrer quotidiennement des obstacles sociaux ou physiques dans leur environnement bâti, lesquels contribuent souvent à une diminution de leur qualité de vie (QV). Cette étude avait pour objectif de décrire les défis actuels en matière d’accessibilité pour les personnes vivant avec un handicap au Canada et d’examiner leurs effets sur la QV. *Matériel et méthodes :* Un sondage (en ligne, par téléphone ou par courrier) a été réalisé auprès de personnes s’identifiant comme ayant un handicap. Les questions portaient sur les expériences liées aux obstacles à l’accessibilité dans cinq domaines prioritaires : environnement bâti, emploi, service à la clientèle, information et communication, et transport. *Résultats :* Au total, 308 personnes ont participé au sondage. Parmi les cinq domaines prioritaires, l’environnement bâti a été identifié comme l’obstacle ayant le plus grand impact sur la QV, tandis que les normes et technologies d’information et de communication exerçaient l’impact le plus faible. Les obstacles les plus fréquemment signalés incluaient la présence d’escaliers, le manque de sensibilisation au handicap et à la capacité d’offrir des accommodements en emploi, des difficultés liées à la présentation des médias et des textes, ainsi que la disponibilité des services de transport. *Conclusions :* Les résultats mettent en évidence les obstacles les plus fréquents affectant la QV des personnes handicapées, en particulier les défis liés à l’environnement bâti et au transport. Ces connaissances sont essentielles pour renforcer les interventions politiques et orienter le développement futur des infrastructures d’accessibilité.

Keywords

Accessibility; Disability; Quality of Life; Built Environment; Customer Service; Program Delivery; Employment; Transportation.

Mots-clés

Accessibilité; handicap; qualité de vie; environnement bâti; service à la clientèle; prestation de programmes; emploi; transport.

Introduction

According to the Social Model of Disability, disability is the result of the interaction between a person’s functional limitations, and barriers within one’s social and physical environments. Individuals living with a disability make up the largest minority group in the world, representing an estimated 16% of the global population (World Health Organization, 2023). In Canada, more than 1 in 4 people aged 15 years and older live with at least one disability (Hébert, et al., 2022), the majority of which are physical or mobility related. Resulting from the combination of functional limitations, environmental, and systematic barriers, individuals with disabilities have lower rates of employment than those without disabilities (Hébert, et al., 2022). Individuals with disabilities are also more likely to be dependent on public infrastructure and services than those without disability (Bureau of Transportation Statistics, 2024; Canadian Urban Transit Association, 2013).

For Canadians with disabilities, daily barriers persist in many areas of one’s daily life (Lau, et al., 2020). Barriers to accessibility may impact access to services (Clemente, et al., 2022; McColl, et al., 2008), recreational activities (Menzies, Mazan , Borisoff, Mattie, & Mortenson, 2021; Imrie & Kumar, 1998), employment or education opportunities (Law, et al., 1999; Zwicker, Zaresani, & Emery, 2017), and/or physical access within public spaces (Imrie & Kumar, 1998; Kapsalis, Jaeger, & Hale, 2022). Access barriers may also impose

financial strain (Maroto & Pettinicchio, 2020) and reinforce societal stigma and discrimination (Lau et al., 2020). Over the past decade(s), improved policies in Canada and internationally have sought to address barriers for people with disabilities. Advancements in policy and standards translate to provisions that affect key aspects of daily life for people with disabilities, which include priority areas such as customer service and program delivery, employment, transportation, physical environment, and information and communication. For Canadians with disabilities, daily barriers persist in many areas of one’s daily life (Lau, et al., 2020). Barriers to accessibility may impact access to services (Clemente, et al., 2022; McColl, et al., 2008), recreational activities (Menzies, Mazan , Borisoff, Mattie, & Mortenson, 2021; Imrie & Kumar, 1998), employment or education opportunities (Law, et al., 1999; Zwicker, Zaresani, & Emery, 2017), and/or physical access within public spaces (Imrie & Kumar, 1998; Kapsalis, Jaeger, & Hale, 2022). Access barriers may also impose financial strain (Maroto & Pettinicchio, 2020) and reinforce societal stigma and discrimination (Lau et al., 2020). Over the past decade(s), improved policies in Canada and internationally have sought to address barriers for people with disabilities. Advancements in policy and standards translate to provisions that affect key aspects of daily life for people with disabilities, which include priority areas such as customer service and program delivery, employment, transportation, physical environment, and information and communication.

Despite improvements to the development and implementation of accessibility policies, barriers for people with disabilities remain (Lau, et al., 2020). The continued presence of daily accessibility barriers may be due to lack of policy development that addresses priorities of people with disabilities, and/or a lack of understanding exactly what barriers exist or how the barriers can be resolved. As has been previously stated, there is often a lack of specificity regarding the context and characteristics of daily barriers reported in the literature by people with disabilities (Lau, et al., 2020). For example, while inaccessible washrooms are often cited as barriers, detailed characteristics of the given washroom facility (e.g., available turning space, grab bar placement, toilet height) would be needed to determine why the barrier exists despite available standards for the design of accessible washrooms. Ambiguity in reported barriers for people with disabilities may contribute to their continued presence. A more detailed understanding of the nature and context of continued barriers for people with disabilities will support greater specificity in accessibility of policy recommendations. This may be particularly beneficial given the growing number of jurisdictions creating accessible policies, and the range of standards employed across Canada.

It is also critical to acknowledge that accessibility barriers for people with disabilities have downstream effects on quality of life (QoL). Determinants of satisfaction and quality of life in people with disability may be influenced by several factors, such as physical health, functional or psychological well-being, social relationships, the

environment, and having a disability (Hughes, Nosek, Howland, Groff, & Mullen, 2003; Tate, Riley, Perna, & Roller, 1997; Hofoss, 2004; The World Health Organization Quality of Life Group, 1999); quality of life impacts may differ for those with a disability when compared to those without disabilities (Crocker, et al., 2020). While quality of life has been a focus within disability policy and research, there is limited literature identifying the impact of daily accessibility barriers on quality of life for people with disabilities. A greater understanding of accessibility barriers on one’s QoL may help direct scientific efforts, funding, and policies toward most pressing needs. Establishing baseline data may also serve to guide deliberative decision making and provide evaluation criteria for policy implementation. The objectives of the present study were to identify current accessibility barriers for people in Canada with disabilities, and determine the effect of these barriers on perceived quality of life.

Materials and Methods

The present study examined barriers to accessibility in five areas, including: Built Environment (BE), Customer Service, Program Delivery, and Procurement (CSPDP), Employment (EM), Information and Communications Standards and Technology (ICST), and Transportation (TP) in accordance with the Accessible Canada Act (Government of Canada, 2019). Operational definitions for these priority areas have been previously provided by Lau et al., 2020.

Participants

Individuals who identified as a person with disability (PWD) were recruited to take part in this study via convenience sampling. The survey was advertised broadly across Canada via social media and disability organization networks with no specific targeting of provinces or disability types. Participants were at least 18 years old and resided in Canada. This study was conducted in English due to resource limitations. All participants provided informed consent prior to survey participation, and the survey was approved by the University Health Network Research Ethics Board (REB#19-5733).

Survey Methodology

The survey was conducted between January 2020 and July 2020 (28 weeks). Participants could take part in the survey using the online survey tool (SurveyMonkey, Inc. 2020), using paper forms sent by mail, or by telephone with a member of the study team. If conducted by a telephone interview, the researcher reads each survey question aloud and transcribed the participant’s responses. Researchers were permitted to ask the participant to repeat a response in cases of difficulty with hearing a response but were not permitted to ask for additional clarification about participant responses or answer questions from participants

about survey items. All interviewers followed this procedure to try to minimize any influence this survey implementation method may have on participant responses.

Questions in the survey were grouped into two sections: First, demographic questions (including, age, sex, type of disability, and the use of assistive devices, aids, and/or service animals). Second, closed-answer (i.e., ratings on a Likert scale) and open-answer questions about experiences with barriers in each priority area (BE, CSPDP, EM, ICST, TP). The response options for demographic questions were adapted from the Canadian Survey on Disability 2017 (Cloutier, Grondin, & Levesque, 2018).

In all survey formats, the orders of the five priority area barriers were presented in a randomized order. Participants were asked to rate the effect of barriers in each priority area on their perceived quality of life (QoL) on a 4-point Likert scale. The rating options were as follows: Not applicable - I do not experience barriers in this area; Not at all; A little; A moderate amount; and A great deal. For those who experienced barriers in each area of accessibility, respondents were then given the option of describing these barriers in greater detail. An example of the questions asked for one of the priority areas (e.g., Transportation) is provided below:

Q: If applicable, what are the main barriers to accessibility that you experience in
Transportation?

Similar question formatting was applied for each of the five priority areas.

Data Analysis

Demographic data and ratings of the effect of barriers on perceived QoL were summarized using descriptive statistics. Friedman's Test was performed to determine differences in QoL ratings between the five priority areas of accessibility (with 1 being QoL "not at all" impacted and 4 being QoL impacted by "a great deal"). Following the identification of a significant Friedman's Test, the Wilcoxon Signed Ranks Test was used to determine significance between related pairs. Bonferroni corrections were applied to account for multiple comparisons, where significance was considered at $p < .005$.

Participant open responses describing specific barriers to accessibility in each priority area were summarized via frequency analyses performed using Microsoft Excel 2016. These responses were coded by two members of the study team to (1) characterize barriers to accessibility in each priority area, (2) identify the broad categories in which barriers occur, and (3) determine the frequency with which barriers were reported for each individual area of accessibility. The protocol for coding survey comments was developed based on previous literature conducting qualitative thematic analysis (Guest, MacQueen, & Namey, 2011). In addition to identifying the key barriers and categories of barriers experienced in each priority area, the frequency of individual barriers was determined. Only barriers unique to each category were included in the results. For instance, BE-specific barriers identified within the CSPDP category were omitted from the reported findings.

Results

The final study sample consisted of data from 308 eligible participants who responded during the period of survey availability. Demographic characteristics are summarized in Table 1 and 2 along with comparative Canadian data for people with disabilities (Statistics Canada, 2022).

Table 1. Summary of participant demographics

		Participants (n=308)	Canada ^a (%)
Age (years)			
	Mean (SD)	51.9 (16.8)	---
Sex (% of participants)			
	Female	65.9%	56.6% ^b
	Male	27.6%	43.4% ^b
	Other	2.3%	---
	Prefer not to answer or no response	4.2%	---
Province of residence (% of participants)			
	Alberta	6.8%	11.4%
	British Columbia	16.9%	14.5%
	Manitoba	3.6%	3.7%
	New Brunswick	2.3%	2.8%
	Newfoundland & Labrador	1.6%	1.6%
	Northwest Territories	0.0%	0.1%
	Nova Scotia	1.0%	3.8%
	Nunavut	0.0%	0.1%
	Ontario	63.3%	40.6%
	Prince Edward Island	0.3%	0.5%
	Quebec	2.9%	17.8%
	Saskatchewan	2.6%	3.1%
	Yukon	0.3%	0.1%
Employment or student status (% of participants)			
	Employed full-time	18.5%	---

Employed part-time	19.2%	---
Retired	33.4%	---
Student	11.4%	---
Volunteer	17.9%	---
Unemployed, disability, or other	24.4%	---

^aPresented as prevalence among Canadians (aged 15 years and older) with disabilities.

^bProportion of Canadians with a disability by gender.

--- Comparative data unavailable.

Source: Statistics Canada, Canadian Survey on Disability, 2022.

Table 2. Summary of participant-reported disability types and assistive devices (% of participants)

	Participants (n=308)	Canada ^a (%)
Number of disability types		
1	33.8%	29.4%
2 to 3	39.3%	36.7%
4 +	26.3%	33.9%
No response	0.6%	---
Disability type		
Mobility	67.5%	39.2%
Pain-Related	42.5%	61.8%
Flexibility	30.8%	40.3%
Dexterity	23.4%	18.4%
Mental Health	22.4%	38.6%
Hearing	16.9%	20.7%
Seeing	15.3%	27.4%
Memory	12.3%	18.2%
Learning	10.7%	20.7%
Developmental	5.2%	5.7%
Other	13.0%	---
No Response	0.6%	---
Types of assistive devices, aids, and service animals		
Mobility, agility or grasping devices ¹	54.87%	---
Corrective or protective lenses	50.0%	---
Sound adaptive devices ²	12.66%	---
Text and screen adaptive devices ³	11.04%	---
Prosthetics, orthotics, braces	7.79%	---
Service animal	3.57%	---
White cane	1.95%	---
Service person ⁴	1.30%	---
Other ⁵	13.64%	---
No response	12.66%	---

Abbreviations: SD, standard deviation. ¹canes, walkers, wheelchairs, scooters, graspers, etc., ²hearing aids, speech-to-text, etc., ³screenreaders, magnifiers, braille machines, ⁴sighted guide, interpreter, intervenor, notetakers, live captioners, personal support workers, ⁵Computers and computing devices, specialized vehicles, breathing devices, feeding devices, pain management devices, fidget devices, voice-controlled devices,

sound barriers and baffles, protective devices, alert devices, other specialized devices and tools.

^aPresented as prevalence among Canadians (aged 15 years and older) with disabilities.

--- Comparative data unavailable; *Source*: Statistics Canada, 2022.

The Effects of Barriers in Each Priority Area on Quality of Life

Ratings of the effect of barriers on the QoL of participants were analyzed to determine the impact of each priority area on the lives of these individuals. Table 3 presents a summary of the ratings of the impact of quality of life for each area of accessibility. Friedman’s test revealed a statistically significant difference in impact of barriers on QoL between all priority areas ($\chi^2(4)=138.842$, $p<0.001$). As shown in Table 3, BE was ranked as affecting QoL to a “moderate amount” or “great deal” by 63% of respondents, emerging as the highest overall mean rank across all participants, followed by TP ($Z=2.550$, $p<0.001$), CSPDP ($Z=5.575$, $p<0.001$), EM ($Z=6.238$, $p<0.001$), and ICST (9.150, $p<0.001$). Barriers in ICST were identified as impacting QoL to a “moderate amount” or “great deal” by the least proportion of respondents (25.3%).

Table 3. Summary of responses (% of participants; $n=308$) indicating degree of impact of barriers on quality of life within each priority area of accessibility on quality of like.

Area of accessibility

Degree of impact of barriers on quality of life	BE	CSPDP	EM	ICST	TP
A great deal	32.5%	20.1%	23.4%	9.7%	27.6%
A moderate amount	30.5%	25.6%	20.1%	15.6%	29.5%
A little	19.2%	24.0%	14.3%	26.0%	20.1%
Not applicable/I do not experience barriers in this area	17.9%	30.2%	42.2%	48.7%	22.7%
Mean Rank	<i>Mean</i> 2.63	2.15	1.88	1.51	2.45
<i>SD</i>	1.36	1.4	1.63	1.36	1.4

Abbreviations: BE, Built Environment; CSPDP, Customer Service, Program Delivery, and Procurement; EM, Employment; ICST, Information and Communication Standards and Technology; TP, Transportation.

**indicates significant pairwise comparisons between areas of accessibility*

Detailing Barriers to Accessibility within Priority Areas

Two-hundred and eighty or ~91% of respondents opted to provide details regarding specific barriers within at least one of the priority areas of accessibility.

A total of 2202 references to 252 individually-identified barriers to accessibility were identified in the descriptions of barriers experienced by participants. Details describing the most frequently reported barriers in each of the priority areas of BE, CSPDP, EM, ICST, and TP are summarized in Tables 4 to 8, respectively. Many barriers were reported infrequently by a small number of participants. For this reason, only barriers that were (a) ranked within the top ten, and that were (b) referenced at least ten times are summarized as categories within each priority area. Not all priority areas met these criteria (e.g. ICST). Where applicable, barrier details are provided to include specific codes with ≥ 10 references for

each category. Not all categories had codes that were referenced greater than or equal to 10 times (denoted as “-”).

The Built Environment

As shown in Table 4, the most reported barriers in BE pertained to the use of doors and door-related features (e.g., lack of operating controls, door width). This was followed by the presence of stairs and steps, unmaintained or uneven sidewalks, a lack of or poorly designed accessible washrooms, and a lack of elevators. Of the top ten reported barriers, three barrier categories were related to issues with level changes (e.g. presence of stairs, maintenance of elevators, lack of ramps), and two were related to the use of pedestrian infrastructure (e.g. sidewalk maintenance, design/lack of curb cuts).

Table 4. Summary of the ten most common barrier categories in the Built Environment (BE). Barrier details include codes with ≥10 references for each category.

	Barrier	Barrier Details	Number of references (% of total references; n=729)
1	Doors and door-related	Door design; Door width; Lack of automatic doors; Lack of operating controls	80 (10.97%)
2	Stairs and steps	Presence of stairs	77 (10.56%)
3	Sidewalks	Sidewalk maintenance; uneven sidewalks	69 (9.47%)
4	Washrooms	Lack of accessible washrooms; Washroom design/layout	65 (8.92%)
5	Elevators	Lack of elevators; Elevator maintenance	42 (5.76%)

5	Curbs	Design of curb cuts; Lack of curb cuts	36 (4.94%)
7	Sensory	Lighting & visual; Noise, sound & acoustics	35 (4.80%)
8	Parking	Lack of accessible parking; Parking space design	30 (4.12%)
9	Ramps	Lack of ramps	29 (3.98%)
10	Interior spaces	Interior spacing and layout	28 (3.84%)

Customer Service, Program Delivery, and Procurement

Within the area of CSPDP (Table 5), the most frequently reported barrier was issues with service design, including the interior spacing and layout of a location (e.g. products placed in path of travel), the lack of accommodations available as a person with a disability, and businesses not procuring items to facilitate access. Interacting with staff in customer service roles also presented as a barrier across several categories, including difficulty understanding or being understood (Communication), being denied service or not receiving the necessary assistance (Service provision), being treated poorly by employees due to being a person with disability (Attitudes, assumptions & stigma), and staff not having the requisite knowledge or training to provide appropriate assistance to someone with a disability (Knowledge, awareness & training). Though not included in the results presented in Table 5, reported barriers relating to the built environment were also

numerous within the CSPDP priority area; similar to those highlighted in BE (Table 4) these BE-related barriers ranged from challenges with entering a building, the presence of stairs, issues with operating controls, the availability and design of accessible washrooms.

Table 5. Summary of the ten most common barrier categories in Customer Service, Program Delivery, and Procurement (CSPDP). Barrier details include codes with ≥10 references for each category.

	Barrier	Barrier Details	Number of references (% of total references; n=392)
1	Service design	Lack of accommodations; Interior spacing and layout; Procurement	47 (12.0%)
2	Communication	Communication challenges; Lack of communication preferences	28 (7.2%)
3	Service provision	Denial of service; Need for assistance	27 (6.9%)
4	Attitudes, assumptions & stigma	Interactions with others	24 (6.1%)
4	Service availability	Access to services	24 (6.1%)
5	Product height & service counters	Counter height; Location of goods	23 (5.9%)
6	Information provision	Access to information	21 (5.4%)
7	Knowledge, awareness & training	Lack of training	19 (4.8%)
8	Deliveries	---	16 (4.1%)
9	Sensory	Air quality, lighting & noise	14 (3.6%)
10	Queuing & wait times	---	12 (3.1%)

Employment

As shown in Table 6, the most frequently reported barriers within EM were categorized as those related to employers’ attitudes towards employing individuals with disability and their assumptions regarding the capability of a person with a disability to complete the tasks associated with the position. Availability of job opportunities was also commonly identified with many respondents mentioning they were unable to work as a result of their disability (Employment & work), while those seeking employment encountered barriers during the application process (Recruitment, hiring & onboarding), or were limited in the types of employment opportunities they could pursue (Promotions & career advancements). Issues related to workplace culture and the lack of flexibility with hours, schedules, and ability to work from home (Culture, engagement, & participation), as well as the inability to perform work in a prolonged seated or standing position (Job requirements) were also reported. Finally, a lack of accommodations, or an unwillingness from employers to provide appropriate accommodations, were also a commonly experienced barrier within Employment.

Table 6. Summary of the ten most common barrier categories in Employment (EM). Barrier details include codes with ≥10 references for each category.

Barrier	Barrier Details	Number of references (% of total references; n=326)
1 Attitudes, assumptions & stigma	Attitudes towards disability; Perceived inability to perform job tasks; Stigma & discrimination	60 (18.4%)
2 Employment & work	Lack of employment opportunities; Unable to work	53 (16.3%)

3	Culture, engagement & participation	Lack of flexibility	34 (10.4%)
4	Systems, policies & practices	Lack of accommodations	29 (8.9%)
5	Job requirements	Challenges with sitting/standing	28 (8.8%)
6	Recruitment, hiring & onboarding	Applying to jobs	19 (5.8%)
7	Knowledge, awareness & training	---	13 (4.0%)
8	Assistive technology	---	12 (3.7%)
9	Communication	---	11 (3.4%)
10	Promotions & career advancements	Access to opportunities	10 (3.1%)

Information and Communication Standards and Technology

The most frequently reported barriers within ICST are summarized in Table 7. The most commonly reported barrier focused on the provision of information, including difficulties in accessing information or information not being presented in alternative formats. Barriers related to the presentation of text, including font sizes being too small on websites or printed materials (Design elements), a lack of captions for videos (Captions), and a lack of descriptions (e.g. ALT text) for media formats (Descriptive text/audio) were also reported. Respondents also mentioned not having assistive technology, or their assistive technology not being compatible with forms, documents, or websites as a major barrier within the area of ICST.

Table 7. Summary of the (up to ten) most common barrier categories in Information and Communication Standards and Technology (ICST). Barrier details include codes with ≥ 10 references for each category.

	Barrier	Barrier Details	Number of references (% of total references; n=208)
1	Information provision	Challenges accessing information; Lack of accessible alternatives	34 (16.3%)
2	Design elements	Font size	31 (14.9%)
3	Assistive technology	Access to assistive tech; Compatibility with assistive tech	26 (12.5%)
3	Captions	Lack of captions	26 (12.5%)
4	User experience	Challenges navigating internet	20 (9.6%)
5	Communication	Language & interpretation	17 (8.2%)
6	Financial barriers	Cost of services	15 (7.2%)
7	Tech literacy	Knowledge of new technologies	13 (6.3%)
8	Descriptive text/audio	Lack of descriptions	10 (4.8%)

Transportation

Within Transportation, the most frequently cited barriers by respondents focused on service availability, including their ability to use transit, whether or not accessible vehicles are available to use, and the reliability of the transit service. This was followed by geographical coverage, where respondents mentioned not having transit service in their area, accessible transit stops not being located nearby, or needing to make multiple transfers within the transit system. Vehicle design was also identified as a barrier,

including not enough seating or a lack of space to accommodate assistive aids/devices. Barriers related to overall user experiences were frequently reported, with many respondents specifically highlighting the attitudes of service providers and their lack of training when assisting persons with disability, negative attitudes/harassment from other transit users when attempting to use the provided accessibility features (e.g. accessible seating), and the impact of crowding on shared transit. Respondents also reported issues related to boarding vehicles, such as entering with their assistive aids/devices or poor winter maintenance of transit stops. A summary of the most frequent barriers in Transportation is presented in Table 8.

Table 8. Summary of the ten most common barrier categories in Transportation (TP). Barrier details include codes with ≥10 references for each category.

Barrier	Barrier details	Number of references (% of total references; n=547)
1 Availability & service provision	Availability of accessible vehicles; Inability to use transit; Lack of reliable service	64 (11.7%)
2 Geographical coverage	Connecting transit service; Lack of transit options; Location of transit stops	60 (11.0%)
3 Vehicle design	Compatibility with mobility aids; Lack of seating; Seating design	48 (8.8%)

4	Service providers	Attitudes, awareness, knowledge; Denial of service; Lack of training	44 (8.1%)
5	Entry/Exit	Challenges with entering/exiting vehicle	41 (7.5%)
6	Booking/Scheduling	Challenges with scheduling	34 (6.2%)
7	Financial barriers	Cost of service	27 (4.9%)
8	Attitudes, awareness & knowledge	Access to seating	26 (4.8%)
9	Crowding	Presence of other people	24 (4.4%)
10	Maintenance of transit stops	Lack of snow removal	23 (4.2%)
10	Customer notices	Announcements	23 (4.2%)

Discussion

Barriers to access exist for many individuals with disabilities, in many areas of their daily lives. This study aimed to identify barriers that persons with disabilities experience in different priority areas of accessibility and understand the perceived effect of these barriers on their quality of life. The findings of this study showed that barriers within the Built Environment and Transportation had the largest effect on quality of life for people with disabilities.

Environmental barriers for people with disabilities have been shown to have significant impacts on social isolation, access to health care services (Makansi, et al., 2021; Frost, Bertocci, Stillman, Smalley, & Williams, 2015) and safety (Giraldo-Rodriguez, Mino-Leon, Murillo-Gonzalez, & Agudelo-Botero, 2019). Thus, it is not surprising that barriers within the built environment emerged as having the largest impact on perceived quality of life for people with disabilities. The elements of the physical environment were also detailed as some of the most commonly encountered barriers within almost all other priority areas of accessibility which further emphasizes the importance of the built environment for people with disabilities.

The most frequently identified and detailed barriers within the Built Environment were related to building access or circulation within a building (e.g. door-related issues, presence of stairs, lack of ramps, lack of elevators), accessibility of washrooms, and availability/maintenance of pedestrian infrastructure (e.g. curbs, sidewalks). Many of these issues are addressed in existing Canadian accessibility standards (e.g., CSA B651). However, the barriers highlighted by participants primarily reflect the absence of accessible features, such as ramps where stairs exist, or the unavailability of accessible washrooms or elevators, rather than deficiencies within the design of existing accessible elements. Retrofitting existing spaces to comply with current accessibility legislation, such as the Accessibility for Ontarians with Disabilities Act (AODA), often presents considerable financial and logistical challenges for businesses and organizations.

Although Canadian legislation mandates accessibility, numerous older buildings remain exempt from compliance requirements unless substantial renovations are undertaken. This underscores the need for enhanced support, resources, and incentives to facilitate accessibility retrofits within existing structures.

Beyond limiting equitable access, these barriers may prevent individuals from participating in cultural or other activities within public buildings (Carlsson, et al., 2022). The absence of alternatives, such as stairs without accompanying ramps, or doors that are difficult to operate, further poses safety concerns for people with and without disabilities. Egressibility has been highlighted as a largely overlooked area of policy for people with disabilities, and the current findings provide further evidence of specific barriers that would present as safety issues for people with disabilities during emergency evacuations. While accessibility standards within the Built Environment tend to focus on the removal of physical barriers to provide access, the design of sensory environments (e.g., lighting & visual; noise, sound & acoustics) is equally important for promoting equitable access within a space.

Along with Built Environment, Transportation emerged as a priority area greatly impacting perceived quality of life. For people with disabilities, reliance on public transit services is often necessary to fully participate in many aspects of daily life (e.g., employment, social activities, etc.) (Sabella & Beyzak, 2019; Penfold, Cleghorn, Creegan, Neil, & Webster, 2008; Bezyak, et al., 2020), so it is not surprising that barriers within

Transportation significantly impact QoL. These findings are also consistent with a recent report summarizing the transportation needs of older adults in Canada, which has indicated that age-related health changes and social stigma associated with ageing affects an older adult’s access to transportation (Council of Canadian Academies, 2018). While many specific barriers were reported within Transportation, respondents most consistently detailed service-related barriers (e.g., reliability/availability of service), geographical coverage (e.g., location of transit stops) and negative attitudes/assumptions from both service providers and other transit users. Since our respondent sample represented various jurisdictions and regions across Canada, these specific barriers emerging as most common suggest that (a) system-related barriers may be not be isolated to certain regions or specific transportation organizations, but exist more broadly across the transportation sector, and (b) changes at a policy-level within transportation organizations are necessary to address ongoing barriers to accessibility.

Our findings also underscore the importance of recognizing how accessibility barriers intersect across different accessibility domains. For example, while barriers with Customer Service, Program Delivery, and Procurement (CSPDP), Employment (EM), and Information and Communication Standards and Technology (ICST), were not as frequently rated as having a great or moderate impact on QoL compared to Built Environment and Transportation, the intersectionality of responses in these areas was notable. The link between a supportive built environment and service access for people with disabilities has

been well-documented in the literature (Botticello, Rohrbach, & Cobbold, 2014; Jónasdóttir, Egilson, & Polgar, 2020), with service access barriers translating to missed appointments, delays to necessary health services (Syed, Gerber, & Sharp, 2013), or receipt of preventative care (Marrocco & Krouse, 2017). Similarly, transportation barriers intersect with employment which may have major implications for continued employment disparities among people with disabilities (Sabella & Beyzak, 2019). Transitioning to a work-from-home employment model might help to address numerous transportation-related barriers, fostering greater equity in employment. It is important to note that this survey was conducted prior to the onset of COVID-19 restrictions in Canada, and reported barriers from participants may now change, especially concerning employment, as remote work has become more prevalent.

Of final note, barriers with attitudes, assumptions, lack of disability awareness and stigma was common across all priority areas of accessibility, aside from Built Environment, aligning with past research (Wayland, Newland, Gill-Atkinson, Vaughan, Emerson & Llewellyn, 2020; Hackett, Steptoe, Lang, & Jackson, 2020; Jones, Finkelstein, & Koehoorn, 2018; Temple, Kelaher, Brooke, Utomo, & Williams, 2020; Temple, Kelaher, & Williams, 2018;). The presence of stigma and discrimination experienced by individuals with disability aligns with continued societal perception of disability from a medical model lens (Bunbury, 2019). There is an ongoing need for improved systemic-level changes or policies driven by a social model of disability to address these barriers.

Limitations

There are several study limitations that should be acknowledged. This study recruited respondents via convenience sampling. While a wide range of respondents from across Canada were included, our respondent sample may not fully represent population-level demographics of adult Canadians (Statistics Canada, 2023). For example, the majority of respondents were female and resided in Ontario. Inclusion of a greater number of males in future studies is warranted given there is an approximately equal distribution of men and women with disabilities in Canada. Additionally, greater representation from Atlantic, Prairie, and Northern provinces or territories would provide greater insight into barriers possibly due to regional/geographical limitations. Finally, we were limited to include only those who responded to our English language survey, which would have limited our sample demographics.

Our limited sample size did not allow us to conduct analyses considering individual disability types for impact of barriers on quality of life, and the majority of our respondents indicated having a mobility-related impairment which may have influenced the reported barriers. We also did not explicitly ask individuals to provide detailed barriers in each priority area of accessibility. Rather, individuals may have opted to provide these additional details. Given the limited sample size of those respondents who identified detailed or specific barriers within each subgroup, we were unable to compare individual

barriers across groups. However, by collapsing the groups included in this study, we are able to summarize continued barriers that are present in Canada, across various disability types represented in our findings.

Conclusion

This national study provides an up-to-date understanding of the impact of barriers to accessibility on quality of life for people with disabilities. Such information is valuable to assess the effectiveness of interventions in policy and practice for people with disabilities. Ongoing barriers existing across various types of disabilities and multiple areas of accessibility have been summarized and may provide guidance to individuals or organizations that aim to improve accessibility. The persistent presence of barriers, as reported in this study, illustrates the need for continued improvements to existing accessibility infrastructure, legislation, policy, and services.

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