

EVIDENCE BRIEF

Participant Facilitators and Barriers to Diabetes Prevention and Treatment Programs and Self-Management Strategies

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Key Messages

- Type 2 Diabetes (T2D) is a prevalent chronic disease associated with serious illnesses, disabilities, and death. Due to the significant impact on population health and well-being, as well as on health care costs, prevention, treatment, and self-management strategies are crucial. While efforts are being made to improve diabetes care and prevention, barriers to participation and adherence to prevention programs at the individual, community, and systemic levels remain.
- Risk awareness, motivation to improve health, and positive health outcomes facilitated individual participation and adherence. Community-level facilitators consisted of access to exercise facilities, safe green spaces, and social support from peers, friends, and family. Systemic facilitators included access to clear and meaningful information, positive relationships with health care providers, and tailored approaches to diabetes care.
- Lack of time due to work and family obligations was the most frequently reported individual level barrier to participation in and adherence to diabetes management. At the community and systemic levels, cost related barriers had the greatest impact. Limited access to healthy foods, transportation, resources for physical activity, and diabetes care/supplies due to economic strain also impaired both participation and adherence.
- Social determinants of health (SDoH) and equity considerations including underlying social, economic, and environmental factors were described across the literature; specifically income, gender, and culturally-responsive care. Gender differences as it relates to social support and safety concerns were highlighted, with women facing increased barriers due to household responsibilities and harassment during exercise. Cultural responsiveness of programming (e.g. traditional foods and ingredients) and household education levels were also identified as key influencers.
- Significant barriers at the community and systemic levels (e.g. transportation, cost of and access to healthy foods) highlight the need for equity-based, upstream approaches and population-level interventions to diabetes management and prevention. Further exploration of solutions to mitigate the impact of SDoH inequities is needed to inform best practices.

Issue and Research Question

Recent projections indicate that by 2050, more than 1.27 billion people across the globe will be affected by Type 2 Diabetes (T2D).¹⁻³ Diabetes-related complications include nerve and blood vessel damage, blindness, kidney failure, heart attacks, stroke, lower limb amputation and premature death.^{4,5} Canada spends \$9 billion annually on health care, disability, work loss, and premature death costs related to diabetes. In Canada, the burden of diabetes is predicted to increase demand on the health system with estimates that, between 2011/2012 and 2021/2022, new cases of diabetes are expected to result in \$15.36 billion in health care costs.⁶ As of 2023, 30% of Ontarians live with diabetes or prediabetes resulting in an estimated direct cost of \$1.7 billion to the healthcare system.⁷

Commonly reported risk factors for T2D include overweight and obesity and sedentary behaviour.⁸ As such, prevention, treatment, and management strategies often focus on lifestyle changes like healthy diet and increased physical activity in an effort to promote weight loss, lower blood glucose, and improve insulin sensitivity. In Ontario, a \$741 million strategic plan was implemented in 2008 to expand services and improve health outcomes for people with diabetes. The Ontario Diabetes Strategy sought to increase awareness of risk factors to diabetes development, support patients with diabetes management, and encourage the adoption of evidence-based guidelines on the provider end.⁹ While improvements in the availability of diabetes care were noted, under-utilization of management and preventative services remains an issue and rates of disease continue to persist.¹⁰ The effectiveness of population based diabetes programming has been well documented however the factors influencing uptake and adherence from the participant perspective remain unclear.¹¹ More specifically, the social, economic, behavioural, genetic, and environmental influences on user experience with diabetes prevention and management must be examined. As well, given that factors across the individual, community, and systemic levels inform health behaviours, a nuanced approach using the socio-ecological model is imperative for a thorough understanding.

Therefore, this Evidence Brief asks: *What are facilitators and barriers to participation and/or adherence to type 2 diabetes treatment/prevention/risk factor reduction programming and self-management as experienced from the participant perspective?*

Methods

A literature search was conducted on March 8, 2023 by Public Health Ontario Library Services for articles published from 2013-2023. The search involved six databases that included MEDLINE, Embase, CINAHL, PsycINFO, Health Policy Reference Center, and Scopus. The following search terms were included, but were not limited to: "Diabetes Mellitus, Type 2", "Prediabetic State", "Life Style" "Health Risk Behaviour", "barrier or enabler", "facilitator or implement", "Program Development", "lifestyle treatment", "nutrition", and "physical education". The full search strategy is available upon request from PHO.

Articles were eligible for inclusion if they described the facilitators and/or barriers to participating in or adhering to a T2D or prediabetes intervention, program, or policy from the participant perspective.

Articles were excluded if they were not exclusively related to T2D or prediabetes; from a non-OECD country; commentaries, editorials, books, or conference proceedings; focused solely on the effectiveness of the intervention, program, or policy; virtual intervention type; focused solely on the perspectives of health care providers or program/intervention/policy facilitators; and not in English.

This brief is limited to facilitators and barriers for the general population. Facilitators and barriers relevant to populations experiencing marginalization are complex and are rooted in systemic oppression and as such, they require a nuanced and in depth examination beyond the scope of this brief.

Two reviewers independently screened title and abstracts. During screening it was decided that articles published before 2018 would be excluded due to the volume of results. Full text articles were retrieved, and reviewed by the same two reviewers. Consensus was achieved through discussion on any conflicting reviews.

Two reviewers independently conducted quality appraisal on articles pertaining to general populations. The Health Evidence Quality Assessment tool was used to assess the quality of reviews. The Critical Appraisal Skills Programme (CASP) tool was used to assess the quality of qualitative single studies.¹² The Effective Public Healthcare Panacea Project (EPHPP) tool was used to assess the quality of quantitative single studies.¹³ The Newcastle-Ottawa Scale (NOS) was used to assess the quality of cross-sectional single studies.¹⁴ Discrepancies in quality appraisal outcomes between the reviewers were resolved by consensus. More information on quality appraisal is available upon request. Relevant information was extracted from each article by one reviewer.

Main Findings

The search identified 1,487 articles, from which 36 articles met the inclusion criteria. Two were scoping reviews^{15,16}, one was a literature review¹⁷, one was a metasynthesis¹⁸, and thirty-two were primary studies. Among the primary articles a large majority used semi-structured interviews or focus groups to gather qualitative data from the participant perspective on diabetes management¹⁹⁻⁴⁶, two studies used cross-sectional surveys^{47,48}, one conducted an implementation evaluation⁴⁹, and one was a randomized control trial.⁵⁰

The findings below are organized into two main categories; facilitators and barriers. The data were then categorized based on the socio-ecological models of health behaviour to describe influencers at the individual, community, and systemic levels. By using the socio-ecological model, we are better equipped to understand not only the range of factors that impact health behaviour but the interplay between them and how they may be addressed with upstream approaches.⁵¹ Individual level factors include personal knowledge, beliefs, behaviours, and experiences. Community-level factors encompass the built environment, social resources, and sociocultural norms. Systemic factors involve access to health services and broader organizational resources.⁵² An exploration of social determinants of health (SDoH) and equity considerations, if any were reported, and their impact on the results is also provided.

Facilitators

INDIVIDUAL

The findings from two reviews and sixteen primary articles described a wide range of individual-level facilitators for engagement in diabetes prevention and management. These facilitators include awareness of diabetes risks and treatment techniques, intrinsic motivation for better health, observed health improvements, tailored program experiences, and various program elements. Additionally, the desire to enhance health, understanding diabetes etiology and risks, and program satisfaction all emerged as key motivators. Both Skoglund et al. 2020 and Vilafranca et al. 2021 reviews found that awareness of the risks of T2D (like adverse health outcomes) and treatment techniques (e.g. physical activity) motivated participants to engage in diabetes prevention or management.^{16,18} Similarly, the intrinsic motivation to ameliorate one's own health¹⁶, set a good example for children, and/or avoid

negative health outcomes like becoming a burden on family¹⁸ encouraged participation. Observed changes in health including weight loss and improvements in glycemic control¹⁶, mental health, self-efficacy and self-control, sleep, and energy promoted adherence.¹⁸ The ability to tailor the program to fit specific needs and the resultant autonomy in management also supported adherence, as did the sense of commitment imparted by being monitored within an intervention or program participation in and of itself.¹⁸

Findings from sixteen primary articles mirrored that of the reviews. The desire to improve or maintain health²⁴ via weight loss, lowered A1C¹⁹, reversal of prediabetes^{24,46}, or gaining credible information about disease management motivated participation.^{19,50} Understanding the etiology of diabetes⁵⁰, the risks and modifiers (e.g. diet³⁷, sedentary behavior⁴³, and physical activity^{41,45}), as well as fear of deleterious health impacts⁴⁵ - especially those observed from others' diabetes related complications like loss of mobility, independence, and death¹⁹ - were also facilitators to participation. Program elements like flexible goal setting^{21,32}, access to a health coach⁵³, and nutrition and exercise tracking^{32,37,53} promoted adherence. Overall, satisfaction with program activities (e.g., familiar or enjoyable exercises^{38,45} and hands on cooking classes^{19,21}) and program length^{19,27} and content (e.g., informative, practical, and engaging classes^{19,21,27,34,45,53}) also encouraged adherence as did feeling accountable^{19,32,43,45,53}, achieving goals^{43,46}, objective or perceived health improvements^{19,26,34,38,41,44,45,53}, and positive feedback from others.²⁶ Other factors included being retired or having a flexible work structure³⁹, seeking camaraderie¹⁹, and having disposable income for supplemental resources.³⁹

COMMUNITY

Community level facilitators are categorized into environmental and social factors. Environmental factors included access to exercise facilities, green spaces, and the convenience of program locations and scheduling. Social support emerged as a crucial element and included encouragement from friends, family, healthcare providers, and peers, highlighting the importance of positive relationships and group cohesion in fostering behavior change and adherence to diabetes programming.

ENVIRONMENTAL FACTORS

One review examined the perceived facilitators to lifestyle change among people with prediabetes and found that having access to exercise facilities, green spaces, and organized activities within local communities enabled engagement and adherence to physical activity.¹⁸ This data was supported by a study by Banasiak, 2020 that found individuals with access to walkable neighbourhoods get over an hour more moderate to vigorous physical activity compared to those living in the least activity friendly neighbourhoods.²² Other environmental facilitators included access to resources like gym equipment, trainers¹⁹, and healthy foods²⁵ via diabetes prevention programming. Additionally, the incorporation of culturally appropriate meals in diet focused programming was identified as potential facilitator to diet adherence.²⁴ Program location, specifically geographic proximity to participants^{19,20,39}, as well as convenient scheduling⁵³ and availability of preventative and curative services at the same location⁵³ were important for engagement, as was access to reliable transportation to attend program sessions.³⁹

SOCIAL FACTORS

Social factors involve the relationships and dynamics between the individual and their friends, family, healthcare providers, and community members. Three reviews described facilitators related to social support.^{15,16,18} More specifically, encouragement from others to engage in healthy behaviours^{15,18}, listening, giving advice, and providing assistance¹⁶ were listed as facilitators to diabetes management or prevention. These findings aligned with primary studies that reported peer support or desire for individuals to engage in diabetes prevention or management^{19,21,24,47} including help with reading food

labels²³, medication and exercise reminders^{19,23}, preparing healthy meals³⁹, and partaking in physical activity together^{35,38,53} positively influenced behavior change and adherence. Interestingly, one study also found lack of perceived social support for unhealthy eating habits increased diabetes program attendance.⁵³ Other social factors included positive attitudes from colleagues for physical activity engagement⁴³ and quality relationships with healthcare providers and caregivers.³⁴⁻³⁶ Cohesion among group members was also identified as an important factor for attendance and participation in diabetes programming. Bonding with other group members on similar lived experiences^{19,20,33,41,50}, including social identities such as race, culture^{20,37} and gender^{18,37}, as well as sharing challenges, setbacks^{20,41}, and advice helped foster an atmosphere of trust and camaraderie conducive to sustained participation.^{19,32,37,45}

SYSTEMIC

Findings at the systemic level described information access, relationships with healthcare providers, and provider competencies as key facilitators. One review reported on facilitators at the system level. Skoglund et al. 2022 found access to meaningful and clear information about lifestyle change to be limited outside of diabetes programming.¹⁸ Participants in this review reported the available information to be exceedingly complex, confusing, and inaccessible, whereas diabetes programming allowed access to information and guidance that were applicable and thus, facilitated participation and lifestyle change.¹⁸ Other systemic facilitators like health provider related challenges and the availability of services were described by nine primary studies. Relationships with health providers²⁰ including physicians²⁴, nurses⁴³, pharmacists³⁶, diabetes program leaders⁵³ and nutritionists^{23,42} were found to be crucial to participant satisfaction and adherence. Health provider competencies and communication enabled participants to better understand their disease and how to manage it through lifestyle change.^{23,42,43} Provider understanding and familiarity of the social and economic factors and identities of participants also fostered a more trusting relationship and informed tailored, culturally-safe approaches to management and program enrolment.²⁰ Conversely, some studies showed lack of interaction, appointments, or in-depth discussions with health care providers due to time constraints on the provider end, motivated participants to seek other sources of diabetes education or support, thus facilitating enrolment in programming.^{19,20,36}

Barriers

INDIVIDUAL

Similar to individual facilitators, individual barriers involve personal knowledge, beliefs, behaviours, and experiences, however, these elements work to impede participation and adherence to diabetes management or prevention. Four reviews and thirty-two primary articles described individual barriers encompassing factors like time constraints, poor knowledge of programs, unfamiliarity with healthy foods, concerns about program content and health complications, comorbid conditions, and issues with motivation and accountability. The most frequently reported barriers were related to time constraints due to work and/or family obligations. Scheduling conflicts^{19,23-25,27,29,50} and shift work¹⁵ interfered with program attendance and diabetes self-management. Participants struggled with inflexible work hours^{39,40,47,49,53} and program logistics including long commutes to program location^{17,20,32}, and limited number of meeting times. The time consuming nature of tracking food^{19,37} and physical activity¹⁹ as well as preparing new foods at home⁴² were also key barriers. Similarly, competing priorities^{17,19,22,29,34,37,38,40,44} and family commitments^{16,18-20,40,45,49,53} (e.g., childcare^{15,29,47}, household chores¹⁵, and caregiver responsibilities^{15,17,18}) resulted in limited time to engage in diabetes management.

Other commonly reported barriers involved knowledge, attitudes, and beliefs. Firstly, being unaware of diabetes management programs¹⁹ or receiving limited information about them (e.g., content and personal benefits)²⁹ hindered engagement. Lack of perceived disease significance³¹ and poor or limited knowledge about physical activity, including how it impacts the body, and how to engage in it (such as frequency, duration, and intensity), deterred participation.^{16,30} Likewise, unfamiliarity with new foods and meal preparation^{28,36,37}, confusion regarding nutritional values, and competing dietary requirements^{23,44} proved challenging for participants when trying to engage in or adhere to healthy eating. Interestingly, feeling well informed about their disease also acted as a barrier. Participants felt they already had a thorough understanding of disease status and management techniques and thus did not need to engage in diabetes programming, especially when they felt they receive adequate support and care from their physicians.^{24,29} Additionally, the amount of information and the seriousness of the content being delivered at program meetings were overwhelming.¹⁵ Fears from “knowing too much” about complications and their impacts, and risks of pain and injury during exercise^{16,19} had a paralyzing effect on some participants, resulting in avoidant behaviour towards diabetes management.^{16,19,35,53} A similar paradoxical effect was observed in health status whereby both feeling healthy and unhealthy deterred engagement. Some studies showed feeling healthy or unaffected by their diabetes^{19,20}, or observing improvements in biomarkers including blood glucose²⁹ was a barrier as participants felt they could ignore disease¹⁹ or felt they didn’t need to attend programming^{20,29}. On the other hand, comorbid conditions and diabetes related health issues also impeded participation and adherence. Mobility issues^{27,42}, injury³⁷, and medication side effects or diabetes symptoms like hypoglycemia, dizziness, and fatigue^{19,23,25,28,30,37,38,44,53} made it difficult for participants to travel to program sessions and engage in physical activity. Stress^{28,42,46}, depression¹⁶, low-mood⁴⁶, and cognitive effects like brain fog²⁸ challenged self-management including medication compliance and healthy eating. Lack of intrinsic motivation and issues with accountability were cited as barriers for both participation and adherence to diabetes management programs.^{15-17,44,50} Participants reported challenges with gaining motivation due to busy and tiring schedules^{20,37} and the chronic nature of the disease.⁵³ Specifically, feelings of avoidance and apathy (due to the awareness that diabetes related risks and complications may persist despite lifestyle changes)^{24,29,53}, not seeing progress, or hitting plateaus made it difficult to maintain existing motivation.^{45,53} Difficulties with adherence were exacerbated by disruptions or changes in environment or routine, such as program ending^{45,53}, social gatherings, feeling stressed or emotional⁴⁴, travelling⁴⁶, and inclement weather.^{16,18,38,44,53} Disliking physical activity^{16,35}, preferences towards or dependency on unhealthy foods (e.g., sweets and fried foods^{35,53}), and lack of self-confidence, especially when confronted with gaps in intention and behavior also hindered motivation to diabetes management.¹⁸

COMMUNITY

Barriers at the community level spanned four categories; access to resources, social norms, cultural norms, and social functioning. Four reviews and fifteen primary studies described community barriers. Limited or lack of access to healthy foods, transportation, and safe environments for exercise was the most frequently reported barrier. Participants struggled with either the affordability of healthy foods^{18,23,25,39,42} or finding healthy food options at local grocers^{25,42,47}, food banks²³, or on the go^{18,22} and thereby resorted to calorically dense foods or foods not suitable for diabetes control that were more readily available.^{18,22} Limited access to supplemental resources like affordable gym memberships^{15,16}, safe spaces, parks or indoor facilities^{16-18,23,47} for physical activity opportunities, and technology¹⁷ impacted participation and adherence. Transportation barriers, especially for attendance, were also noted, with one study reporting that the challenge of transportation outweighed the benefits of diabetes programming.³⁹ Difficulty finding transportation to sessions¹⁹, especially in urban settings with unreliable or unpredictable public transit and traffic^{22,29,39}, or when program session venues were

difficult to locate or get to via transit were key obstacles.^{23,34} Long and variable commute times also hindered self-management, with participants being concerned about the risk of hypoglycemia when stuck or delayed on transit.²² Travel costs and inaccessibility for those living in rural areas were barriers to program adherence.^{15,17,42}

Barriers concerning social functioning, including cohesion and support were also described at length. Attendance for group based program sessions suffered due to sporadic attendance from some participants resulting in changes in group dynamics and disruptions to connection building.^{19,37} Social cohesion within groups also suffered when participants compared their progress to their peers and found they did not achieve the same results (e.g., weight loss²⁶ or when groups were too large, resulting in less opportunities to speak or partake in activities³⁴). Lack of social support and understanding from friends and family was detrimental towards self-management, especially in regards to healthy eating. Participants found it hard to change and maintain healthy diets when those around them encouraged them to eat unhealthy foods^{18,23} or when family members were unyielding towards dietary changes as they disapproved foods suitable for diabetes management or had low risk perception.^{15,31,36,37,42,47} Having to exercise alone^{16,44}, receiving incorrect advice on diabetes management²⁴, and social stigma or judgment from peers and family^{18,28,39} also hindered efforts towards healthy lifestyle changes.

SYSTEMIC

Two reviews and five primary studies examined systemic barriers and revealed challenges related to language differences, financial constraints, and health provider related factors including inadequate communication and information. First, language differences often caused barriers to health service access and comprehension of oral or written information.^{15,47} Scheduling difficulties with health providers²⁴ and lack of relevant or current resources also challenged access.²⁸ Problems with health care providers providing insufficient or unclear information^{16,28,47} and communication difficulties due to limited time on the provider end³⁶ often left individuals feeling unsupported and confused when trying to manage their diabetes. Some individuals reported negative experiences with their providers stemming from a lack of cultural or socioeconomic awareness or sensitivity^{28,42}, mistrust²⁸, or indifference to their concerns.⁴⁷ This in turn made sustaining behavior change difficult. Finally, costs associated with diabetes care were found to be restrictive towards management regimens. The cost of living, especially in urban areas with high rent and housing expenses took away from financial resources needed for diabetes management, including medication, devices, supplies, and specialists.²² Gaps in insurance^{23,47}, transportation costs²⁸, costs of healthy foods²³, and out of pocket expenses for programs and membership fees¹⁷ also deterred individuals from partaking in or adhering to diabetes programming or self-management.

Social determinants of health and equity considerations

Many SDoH and equity considerations were described and have been summarized in the following sections. Income was the most frequently reported factor influencing participation and adherence in programming.

INCOME, EMPLOYMENT, AND EDUCATION

Among facilitators, participants in a study by Saju et al. (2022) mentioned having disposable income to purchase exercise equipment and/or pre-made healthy meals was helpful.³⁹ On the other hand, having limited disposable income impeded access to healthy foods, physical activity opportunities such as training facilities and gym memberships, and other supplemental resources.^{15,18,23,25,39,42,47} Income inequities also resulted in barriers to transportation such as the cost of gas, dependency on public transit, and travel costs when using transit, which impedes attendance or adherence to programs and

self-management regimens.^{15-17,22,39,42} As well, economic factors influenced access to health services like appointments with specialists, medications, and devices.^{22,23,47} In addition, employment and precarious working conditions such as shift work, inflexible work hours, and inability to take time off, were barriers to diabetes management.^{15,28,39,47} Finally, low household education was significantly associated with lowered dietary self-monitoring⁴⁶ and low health literacy was associated with lowered risk perception.¹⁷

GENDER

Gender differences especially in regards to social support were also mentioned. While family support was described as a facilitator in many studies, women found family to be a barrier due to household and caregiver responsibilities.^{15,18} Additionally, personal safety concerns about exercising alone¹⁶, exercising outdoors in the dark or during evening/night time³⁸, as well as harassment and abuse were described.¹⁶ Expectations from family members and partners for women to stay at home¹⁶, not go to the gym¹⁵, or avoid wearing western style sportswear^{15,16} were also listed as barriers.

BUILT ENVIRONMENT

Safety concerns as it relates to the built or physical environment was not exclusive to women participants. Having access to safe, walkable neighbourhoods and green spaces was found to be an important facilitator for physical activity among many participants^{18,22}, and lack of these spaces were reported as a barrier.

CULTURE AND LANGUAGE

Culturally responsive education and programs to improve support for management and prevention of diabetes, particularly as it relates to diet, was another key consideration. Participants of non-European descent often reported difficulties with adopting or adhering to dietary plans as the foods recommended to them by providers and programs did not include or accommodate for traditional foods, ingredients or preparation techniques.^{15,22,50}

Limitations

Overall, the quality of the included studies ranged from 'moderate' to 'strong' with the exception of one review being rated as 'weak'. One key limitation described in many of the studies was a small sample size. Issues with participant recruitment and/or retention resulted in smaller sample sizes and impacted the generalizability of results. Additionally, responses from participants that were either lost to follow up or declined to participate were not recorded. It is possible that these participants held more negative attitudes towards programming or management and/or experienced more barriers and as such results may be under representative of this population. Likewise, those who agreed to participate may be more motivated towards behaviour change leading to an over-representation of this population. Social desirability bias may have also impacted results as some studies mentioned exposure of data collectors to participants. Some studies mentioned the issue of single or limited site sampling impacting the generalizability of results as well as homogeneity among study populations as many participants were older and white. Exclusion of non-English speaking participants in some studies also may have impacted generalizability and resulted in selection bias. Finally, most studies used solely qualitative methods including focus groups and open ended interviews for data collection. As such, results are subjective and may have been impacted by self-report bias.

Limitations within the evidence brief itself must also be considered to appropriately interpret results. Articles that included patients with comorbid conditions like metabolic syndrome, obesity, and heart disease were excluded. Given that many T2D patients have these conditions, exclusion of these

populations reduced sample size and may have omitted valuable insights to barriers and facilitators to diabetes management related to health status. Studies on digital, virtual, and app-based diabetes programming/management were also excluded. E-health interventions may alleviate some of the challenges associated with scheduling and accessibility linked with in-person programming. Additionally, e-health programming, telemedicine, and the incorporation of digital or app based elements in traditional programming are rising in popularity, partly due to increased digitalization in a post-COVID world. As such, findings on barriers and facilitators related to time and accessibility that were reported as major barriers may be subject to over-representation and data on technological literacy may be missed and an area that would be worth further exploring.

Discussion and Conclusions

This evidence brief summarizes the literature on facilitators and barriers to participation or adherence to diabetes programming and self-management from the participant perspective. Using a socio-ecological lens, a variety of facilitators and barriers at the individual, community, and systemic levels for the general population were identified.

The majority of facilitators were at the individual and community levels. Observed improvements in health related to improved blood glucose levels^{16,18,19,24,46}, intrinsic motivation to either improve health outcomes or avoid deleterious effects^{16,18,19,24,46}, and a thorough understanding of T2D risks and protective factors^{19,37,41,43,45,50} were key individual level facilitators. At the community level, access to resources in the physical environment and social support were the two most crucial elements. The availability of affordable healthy foods at local groceries²⁵, safe spaces to exercise, and walkable neighbourhoods^{18,22} were important enablers to healthy lifestyle changes. Friends and family helped maintain accountability by providing reminders for medications²³, accompanying participants during physical activity^{18,38,53}, or purchasing or preparing healthy foods^{23,35,39,53}. Words of encouragement or praise and recognizing accomplishments from peers also helped boost motivation.^{16,18,24,26,32,33,36,40,43,47,53}

While many facilitators were described, even more barriers were noted. From an individual standpoint, lack of time and health status were the biggest obstacles. Many studies reported on participants not having enough time to engage in or maintain diabetes management due to work and/or family obligations taking priority. Balancing occupational and household responsibilities including shift work, scheduling conflicts, caregiving, and housework while also commuting to or partaking in program sessions, engaging in physical activity, and/or buying and preparing healthy meals on a daily basis was an ongoing challenge.^{15-20,23-25,27,29,37,39,40,42,45,47,49,50,53} In addition, dealing with diabetes related symptoms and comorbid conditions, as well as their associated medical appointments, and management requirements made it difficult to prioritize lifestyle change.^{16,19,23,25,27-30,37,38,42,44,46,49,53} Conversely, feeling healthy enough was also a barrier as participants felt they did not need to engage in diabetes programming or lifestyle change.^{19,20,29} Perhaps this paradox could inform the development of tailored diabetes programming and enrollment strategies as well as recommendations for lifestyle change on the provider end. The Canadian Diabetes Risk Questionnaire or 'CANRISK' is a tool designed to identify a patient's risk (low, moderate, very high) for developing prediabetes or T2D.⁵⁴ Originally created for adult populations over 40, a modified version was also made for adults aged 39 or younger.⁵⁵ In Canada, this tool has been shown to be effective in assessing diabetes risk across multi-ethnic populations as well as Indigenous populations.^{56,57} Using this tool, screening initiatives could be implemented to identify a patient's individual risk profile, then, based on the degree of risk, they could be guided to the appropriate intervention, prevention, or maintenance strategy/program. Similarly, tailored and person-centred recommendations and messaging from health care providers and public health units can be targeted to better address the unique needs of varying populations with T2D. In this way, programming

may be able to deviate from the one-size-fits all approach and avoid breaking continuity of care for patients across all stages of T2D.

Community and systemic level issues accounted for the bulk of reported barriers. Primarily, access to resources including safe spaces to exercise^{16,17,23,47} as well as affordable healthy foods^{15,18,22,23,25,39,42,47}, transportation^{15-17,19,22,23,27,29,34,39,42}, and health services^{17,22,23,28,47} were impaired due to economic instability and cost. These issues are further compounded when accounting for inequities in the SDoH (e.g. income, education, housing, etc.), as it is well documented that populations facing marginalization including low-income populations are disproportionately impacted by chronic diseases.⁵⁸

The abundance of barriers across all levels in contrast to community and systemic facilitators indicates a lack of large scale population based approaches to diabetes care.⁵⁹ Although individual factors play an important role in diabetes management, upstream interventions and strategies can be more impactful as they aim to address social and economic factors which are the root causes of disease incidence and prevalence.⁶⁰

Results from this evidence brief suggest diabetes interventions must take on an equity-informed approach at the community and systemic levels in order to effect change. One way at the local policy level is to alter the choice architecture (the micro-environmental factors that nudge or subconsciously influence decision making⁶¹) to make it easier for individuals to access to healthy foods and physical activity opportunities. . For example, changing the built environment to prioritize active transport has been shown to encourage physical activity among children and adults, including low income populations.^{62,63}

For more information on the relationship between the prevalence of T2D with the built environment please see the evidence brief: [*The Impact of Environmental Features on Diabetes Prevention*](#). Workplace wellness initiatives⁶⁴ and social media messaging⁶⁵ are also recommended to broaden awareness and engagement in diabetes prevention and management strategies. As well, prevention strategies like targeted screening among populations who experience disproportionate rates of diabetes can aid in early detection of T2D or prediabetes which in turn may reduce disease incidence and related complications.⁶² Culturally relevant programming including but not limited to considerations for culturally appropriate foods in line with diabetes care/prevention and access to resources and health services in multiple languages may also be effective in improving uptake and outcomes for non-European or non-Western populations.^{66,67}

Findings from this brief show there are a myriad of protective and risk factors that must be accounted for when investigating participation and adherence to diabetes management and prevention. Though blanket solutions like large scale diabetes programming and generic recommendations may not be as effective for the individual, population level solutions are crucial to effect change. Especially in light of an aging Canadian population and a rise of new onset diabetes post-COVID^{68,69}, diabetes remains a serious public health issue and as such it is imperative to continue exploring solutions that can be implemented on a population level.

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