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Setting Up for Success: The Process of Creating an Implementation Strategy Plan for Intervention Scale-Up Based on Delivery Team Perspectives

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Abstract

The systematic selection of context-specific implementation strategies is crucial for facilitating the successful implementation of evidence-based practices. In preparation for program scale-up these strategies can inform the development of an implementation "blueprint"; a resource for delivery staff outlining implementation strategies, their goals, and timeline for use of in program delivery. The provision of a user-friendly and easily digestible blueprint has the potential to increase organizational readiness and the likelihood of program uptake. This manuscript describes the process of developing an actionable implementation blueprint as part of the urban scale up of Small Steps for Big Changes (SSBC), a diabetes prevention program focused on exercise adherence and nutrition modification. This was achieved in seven steps: (1) identification of barriers and facilitators to SSBC implementation in current local delivery locations ($n=8$ sites) and through meetings with team members ($n=2$), (2) mapping identified barriers and facilitators to the Consolidated Framework for Implementation Research, (3) use of a matching tool to determine appropriate strategies, (4) operationalization of the selected strategies for specific context, (5) creation of a digestible implementation blueprint based on steps 1–5, (6) creation of a toolkit with resources needed to support the use of each strategy and (7) creation of a tracking system protocol. The final implementation plan consists of 54 implementation strategies and the implementation toolkit includes 26 resources. The identified strategies cover a range of efforts relevant to all phases of the project timeline, from pre-implementation to sustainability and span across all the CFIR domains. This work advances implementation science by outlining a systematic and transparent process for identifying and documenting strategies as part of a large scale diabetes prevention program in community settings across Canada.

Keywords Implementation · Implementation strategies · Scale-up · Diabetes prevention · Prediabetes · Sustainability

Abbreviations

SSBC	Small steps for big changes
DPRG	Diabetes prevention research group
RRC	Regional research coordinator
SL	Site lead
HCP	Health care providers
VCoP	Virtual community of practice
T2D	Type 2 diabetes
SOP	Standard operating procedures
CFIR	Consolidated framework for implementation research
ERIC	Expert recommendations for implementing change
DPP	Diabetes prevention program

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Introduction

Effective implementation of evidence-informed interventions, policy, and knowledge is crucial for improving healthcare practice (Connor et al., 2023; Goorts et al., 2021). However, interventions developed in laboratories have a slow translation process, taking up to 17-years to reach community settings (Morris et al., 2011). When such interventions do reach the community they are rarely implemented as intended (Kilbourne et al., 2007; Rotheram-Borus et al., 2000), resulting in reduced intervention efficacy and increased risk of successful long-term sustainability. To foster an optimal environment for effectiveness, a deep understanding of how to support the uptake, implementation, and sustainability of evidence-based interventions is critical (Grol & Grimshaw, 2003).

To support the implementation process, a phased approach can help identify specific goals and priorities of a project and highlight where resources and efforts should be focused. Implementation follows a phased approach involving exploration, preparation/adoption/planning, active/initial implementation and sustainment (Aarons et al., 2011; Magnabosco, 2006). This project describes these implementation phases as follows: (1) pre-implementation, (2) implementation and (3) sustainability. Throughout the phases of implementation, key considerations of certain implementation strategies assist in outlining distinct implementation efforts (Aarons et al., 2011; Goorts et al., 2021). During the pre-implementation phase, the selection of appropriate strategies suitable for the context of delivery can help outline a plan for program implementation. Implementation strategies are the methods, techniques or tools used to support adoption, implementation, sustainment, and scale-up of interventions (Powell et al., 2019). Implementation strategies can help explain different avenues or ways implementation can be achieved and can help support the implementation effort (Powell et al., 2019).A recent evaluation tracking dynamic changes in implementation strategies for an oncology symptom monitoring program reported that 28 of the 34 identified strategies utilized during implementation were prospectively planned as part of the study protocol (Smith et al., 2022). This emphasizes the importance of selecting appropriate strategies a priori since the majority of the strategies used were identified in the planning phase of implementation. Proctor and colleagues state that implementation strategies are the "how to" component of changing healthcare practice (Proctor et al., 2013); further supporting the notion that knowing "how to" change healthcare practice during the planning phase helps set a project up for success. Once the appropriate strategies have been selected, they can be organized into an implementation blueprint which outlines a formal plan of the select implementation strategies being utilized, the implementation goals, timeframe, and personnel involved (Powell et al., 2015).

While the methods used to develop an implementation blueprint vary, a core element includes the identification of implementation strategies. A recent research agenda highlights the need to enhance rigor in the identification, matching and operationalization of implementation strategies (Powell et al., 2019). To achieve this, we have built on the five-step methodology to systematically create an implementation blueprint suggested by Lewis and colleagues (Lewis et al., 2018).

The process of selecting implementation strategies should involve a systematic approach to identify and prioritize barriers and facilitators. Once identified these barriers and facilitators should be linked to a strategy that can address the barriers and support the facilitators (Powell et al., 2019). Common examples of barriers to implementation include lack of organizational readiness and support, inadequate staffing, cost and lack of resources (McArthur et al., 2021), while facilitators to implementation have been identified as identifying champions and outlining well-designed strategies, protocols and resources (McArthur et al., 2021). Mapping identified barriers and facilitators to strategies can help mitigate these challenges by helping to identify an appropriate strategy to address the corresponding barrier or facilitator.

Defining and tailoring the strategies increases clarity, offers insight into the mechanisms of effect, and improves tracking and reporting of implementation strategies (Powell et al., 2019). Recommendations for operationalizing strategies include: naming and defining the strategy, specifying the actor, action, targets, temporality, dose and the implementation outcomes affected (Powell et al., 2019; Proctor et al., 2013; Smith et al., 2022). Ensuring there is clarity in the description of strategies is a prerequisite for studying them empirically (Proctor et al., 2013). This information can strengthen and support tracking efforts and reporting of adaptations during implementation by promoting transparency and reproducibility in implementation endeavours (Powell et al., 2019; Smith et al., 2022).

Tracking of strategies also enables detailed evaluation of what works under what circumstances and how adaptations impact outcomes (Proctor et al., 2013). If strategies are clearly defined and operationalized, adaptations made over the course of the project will be better identified as slight changes and nuanced adaptations can be easily recognized. Outlining a tracking system protocol will assist in the identification of which strategies are most potent across multiple sites and within a variety of contexts.

The a priori development of a detailed implementation strategy blueprint that specifies how to actionize the strategies to be used and who is responsible for their enactment

increases the probability of successful scale-up of evidence-informed interventions across settings (Lewis et al., 2018). Implementation of programs in the community involves less control by the research system. Providing clear guidance on strategies can assist with implementation efforts performed by the delivery system (Powell et al., 2015). Such an implementation blueprint will also be a helpful resource to reference when tracking adaptations, additions and discontinuations of strategies over the duration of the project. In turn, documentation and reporting of which strategies are effective in which contexts, will advance the field of implementation science and reduce inefficiencies when evidence-informed intervention are attempted to be scaled to diverse settings.

Diabetes prevention programs are often resource and time intensive when transitioned from laboratory to implementing in community settings. Devising a clear plan to address barriers to implementation can help address some of these challenges (Green et al., 2021; Stokes et al., 2019). Small Stesp for Big Changes (SSBC) is a community-delivered, evidence-informed diabetes prevention program. SSBC includes six individual counselling sessions focused on exercise and nutrition behaviours, each followed by supervised aerobic exercise. Sessions are guided by a motivational interviewing counselling style (a client-centered approach), led by a trained SSBC coach (e.g., YMCA staff or volunteers) and completed over a 4–6 week period. Originally tested for efficacy in a laboratory setting (Bourne et al., 2020; Jung et al., 2020; Locke et al., 2018; MacPherson et al., 2020), SSBC has progressed to community setting delivery, where its effectiveness was maintained (Bean et al., 2021; Wurz et al., 2022). With this demonstrated effectiveness and establishment of community partnerships (Bean et al., 2020), SSBC expanded to demonstrate successful implementation in urban (Dineen et al., 2022) and rural fitness facilities across British Columbia. In preparation for large scale-up implementation, the SSBC coach certification process transitioned from in-person to an online training course, and was demonstrated to be effective and acceptable (Cranston et al., 2024; Grieve et al., 2024). In light of the effectiveness and implementation success of SSBC in communities, SSBC has received support to expand into 44 additional urban YMCA locations across Canada.

An implementation blueprint is integral to guide this large-scale implementation across numerous heterogenous urban cities, and can prepare for contextual factors associated with program delivery. This study describes the systematic and robust process of selecting implementation strategies for the development of an actionable implementation blueprint and toolkit and outlines a protocol for tracking and reporting of these strategies throughout the implementation process.

Methods

This study involves the identification and specification of implementation strategies and development of an implementation plan for use in a national scale-up of SSBC, as part of a hybrid type 2 effectiveness-implementation study. Lewis and colleague's implementation blueprint guidelines, and the recommendations for specifying and reporting strategies, informed the seven-step methodology to identify these implementation strategies: (1) Assessment of the context of implementation sites, (2) Mapping implementation barriers and facilitators to implementation determinants, (3) Matching implementation determinants to, (4) Operationalization of the implementation strategies for use in the current context; (5) Creation of an implementation blueprint, (6) Creation of a resource toolkit to support the implementation strategies, (7) Outlining a system for tracking the use of implementation strategies, barriers and facilitators to use and intended outcomes (see Fig. 1). Ethical review was not required for this study as it fell under quality improvement and evaluation of delivery. Verbal informed consent was obtained from participants prior to interviews for Project 3, described further below. Findings taken from previously published work in Project 1 were covered under the Conjoint Health Research Ethics Board: H16-02028, informed consent was obtained from all individual participants included in that study.

Step 1. Assess the Context

Barriers and facilitators to SSBC implementation were identified through three SSBC implementation projects: past,

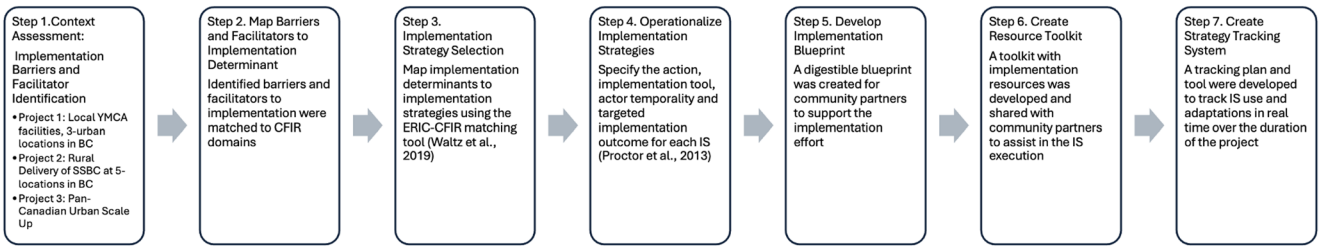


Fig. 1 Method used to select implementation strategies for the SSBC urban scale up

present, and future. The analysis of implementation determinants and the selection for developing implementation strategies were derived from Project 1 and its subsequent expansion. Project 1 represents barriers and facilitators identified retrospectively from completed implementation (Dineen et al., 2022); Project 2 captures barriers and facilitators identified both prior to and during active delivery; and Project 3 captures barriers and facilitators anticipated by sites in the planning phase prior to launch. More detail about each project and how barriers and facilitators were identified is provided below.

Project 1 (SSBC delivery in local urban communities): Beginning in 2017 at three not-for-profit organizations in British Columbia. Project 1 represents the first sites to deliver SSBC by community coaches. Previously published findings evaluating the contextual factors that impeded or facilitated SSBC implementation at these locations was used in the current project (Dineen et al., 2022). Specifically, Dineen et al. (2022) used semi-structured interviews with coaches delivering SSBC and focus groups with site implementation support staff (i.e., site leads or managers) to explore the process of implementing SSBC. Dineen et al. inductively coded descriptive salient themes and linked them deductively to the Consolidated Framework for Implementation Research (CFIR; (Damschroder et al., 2022) constructs. The results generated in Dineen's work were further deductively grouped into barriers and facilitators to implementation.

Project 2 (SSBC delivery in rural [PROVINCE]): Beginning in 2023, Project 2 represents the scale-out of SSBC to five rural community fitness facilities in BC. Before and during delivery, regular meetings were held between the research team and site implementation support staff (i.e., site leads). Each month, standard questions were asked about the implementation of SSBC at their location, and meeting minutes were recorded. Implementation question prompts included program adaptations, readiness to launch, delivery challenges, additional supports used or needed, communication within the delivery site, and communication between the delivery sites and research team. Between February 2022 and July 2024, a total of 82 meeting documents were generated in pre-implementation ($n=27$) and implementation ($n=55$) phases. Meeting minutes were reviewed separately by phase. One researcher (JB) conducted a line-by-line review of each document, systematically extracting excerpts where perceived barriers and facilitators to SSBC implementation were recorded. In addition to the meeting minutes, the researcher conducted a semi-structured key informant interview with the two research coordinators who had facilitated the regular site meetings and supported the delivery of SSBC in the rural locations. Interview questions were generated based on CFIR (Damschroder et al., 2022), see Supplementary Material 1. The discussion was audio-recorded and transcribed, and the researcher conducted a line-by-line coding of the transcript to identify barriers and facilitators to implementation. Barriers and facilitators identified from the meeting minutes and interview transcript were compiled into a summary table. The researcher reviewed the table to identify any overlap between the two data sources, and where barriers or facilitators were conceptually similar, these were consolidated. This process produced a final synthesised set of barriers and facilitators to SSBC implementation from Project 2.

Project 3 (SSBC Urban Scale Up): This project represents the planning phase for the scale-up of SSBC across Canada into 44 YMCA facilities in urban cities. A two-to-four-month planning process took place, dependent on site, involving monthly meetings between delivery sites and the Diabetes Prevention Research Group (DPRG) project manager before the sites launched SSBC. During this time, YMCA associations were asked about factors anticipated to impact the delivery of SSBC in their specific location. Data were gathered from 11 meeting documents arising from the first five implementation sites. One researcher (JB) conducted a line-by-line review of each document, extracting excerpts where anticipated barriers or facilitators to SSBC implementation were recorded. It is noted that the barriers and facilitators identified at this stage reflect factors that delivery sites anticipated would impact implementation before launch, rather than factors observed during active delivery. Following this extraction, the researcher met with the research manager to review and discuss the extracted factors from the meeting documentation. Notes were taken during the meeting, and any additional barriers or facilitators identified through discussion were directly incorporated into the extracted barrier and facilitator list.

At the end of step 1 the barriers and facilitators identified from all three SSBC projects were compiled into a summary table and reviewed by three researchers (NG, JB, AG) to identify overlap. This process produced a final synthesized list of barriers and facilitators to SSBC implementation (see Table 1).

Step 2. Map Implementation Barriers and Facilitators to Implementation Determinants

Identified barriers and facilitators were mapped to constructs of the CFIR (Damschroder et al., 2022). In the original research examining the implementation of SSBC in the community (Project 1), Dineen and colleagues inductively generated codes that were matched deductively to the CFIR (Dineen et al., 2022). In the current study, the inductive codes generated by Dineen and colleagues (Project 1) grouped into barriers and facilitators, as well as the

Table 1 Process of identification for implementation strategies used in the SSBC expansion project

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Planning								
Facilitators								
Involve interested parties in the assessment of whether such a program is needed within their community			X	Outer setting	Local Attitudes	Conduct local consensus discussions		New 2022 construct - matching based on author consensus
Grant funding encourages sites to deliver SSBC	X	X		Outer setting	Financing	Access new funding		New 2022 construct - matching based on author consensus
Holding an aligned vision to support the community through health by the fitness facilities and research group ensures a strong partnership (planning stage).	X			Outer setting	Partnerships & Connections	Building a coalition (62%);	Develop academic partnerships (50%) Develop resource sharing agreements (31%)	
SSBC delivery sets delivery fitness facilities apart from other fitness facilities.	X			Outer setting	External pressure (market pressure)	Conduct local consensus discussions (28%)		
Belief that SSBC is a good fit for the delivery site and staff are well suited to deliver the program	X	X	X	Inner Setting	Compatibility	Assess for readiness and identify barriers and facilitators (34%) Conduct local consensus discussions (41%)	Facilitation (24%) Identify and prepare champions (21%) Tailor strategies (38%)	
Having formal agreements in place holds delivery sites accountable for delivery of SSBC and increases engagement from management		X	X	Individuals	High-Level leaders (Motivation)	Obtain formal commitments (27%)	Alter incentive/ allowance structures (32%) Use capitated payments (5%)	**Use capitated payments**: Payments were provided to sites per client who received the intervention. This served as an incentive to deliver SSBC
Research team to allow time to plan for delivery of SSBC in each unique location to identify potential barriers and facilitators and readiness to engage	X	X	X	Process	Planning	Assess for readiness and identify barriers and facilitators (42%) Develop a formal implementation blueprint (73%)	Develop an implementation glossary (8%) Develop and implement tools for quality monitoring Facilitation (31%) Identify and prepare champions (31%)	**Development an implementation glossary** was included as part of the implementation blueprint.

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Identify where innovation and implementation can be adapted to suit the local context		X	X	Process	Assessing context	Promote adaptability	Assess for readiness and identify barriers and facilitators	New 2022 construct - matching based on author consensus
Involve interested parties within the organization in the planning process	X	X	X	Process	Engaging (innovation deliverers)	Build a coalition (11–44%) Create a learning collaborative (adaptation workshop) (14–22%)	Identify and prepare champions (64–67%)	CFRI Construct were amended in 2022. The new construct combines several previous constructs. This matching is based on the three constructs of formally appointed internal implementation leaders, champions, and external change agents
Involve patient and partner advisory committees to give feedback on implementation decisions			X	Individuals	Implementation Facilitators	Involve patients/consumers and family members (0%) Use advisory boards and working groups (33%)		**Involve patients/consumers and family members**: SSBC alumni were asked to join advisory committees and provide feedback on implementation decisions.
Research team meet site support staff (e.g., member services) and provide educational materials to ensure they have the knowledge about what SSBC consists of to increase whole organization by in.		X	X	Inner setting	Access to knowledge and information	Conduct educational meetings (79%) Develop educational materials (59%) Distribute educational material (55%)	Capture and share local knowledge (31%) Create a learning collaborative (45%)	
Involve a respected employee with formal influence in the planning process for implementation (e.g., Vice-President of Health)	X	X	X	Individuals	Mid-Level leader (motivation)	Build a coalition (18%)		**Build a coalition**: Involving a respected employee is part of the process of building a coalition to support implementation
Formally appoint an individual from the organization to spearhead the initiative and who has capacity to take on this role	X	X	X	Individuals	Implementation Leads	Identify and prepare champion (64–67%)	Identify early adopters (25–41%)	The CFIR domain was previously: Engaging: Formally Appointed Internal Implementation Leaders & Champions.

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Create an internal implementation team, designed to assist the implementation lead and front line staff through regular team meetings during the project	X	X	X	Individuals	Implementation Leads	Identify and prepare champion (64–67%) Organize clinician implementation meetings (21–22%)	Develop implementation blueprint (11–46%)	The CFIR domain was previously: Engaging: Formally Appointed Internal Implementation Leaders & Champions.
Research team and delivery sites work closely to set up SSBC scheduling system. Provision of education material (i.e., flow diagrams, visuals) outlining potential scheduling system based on previous sites.		X	X	Inner Setting	Access to knowledge and information	Conduct educational meetings (79%) Develop educational materials; (59%) Distribute educational materials (59%)	Capture and share local knowledge (31%)	
Develop an evaluation plan to examine whether the SSBC delivery staff executed the program as intended	X	X	X	Process	Doing	Audit and provide feedback (17%) Develop and implement tools for quality monitoring (31%) Develop and organize quality monitoring systems (21%) Use data experts (0%)	Conduct ongoing training (28%) Create learning collaborative (21%) Organize clinician implementation team meetings (24%) Provide ongoing consultation (24%) Purposefully reexamine the implementation (45%) Remind clinicians (3%)	**Use data experts**: Data experts assisted with developing the evaluation plan. **Audit and providing feedback** This IS helped staff determine if the program was delivered as intended **Remind clinicians**: As part of the evaluation plan staff were reminded to completed associated documentation
Provision of evaluation training involving information on collecting data and scheduling clients including hands on training (i.e., HbA1c, 6MWT)		X	X	Inner setting	Access to Knowledge and Information	Conduct educational meetings (79%)	Develop educational materials (59%) Distribute educational materials (55%)	

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Review previous SSBC delivery implementation success and failure to determine what works and what doesn't		X	X	Process	Reflecting & Evaluating	Capture and share local knowledge (24%) Stage implementation scale up (4%)	Facilitation (20%) Model and simulate change (0%) Obtain and use patients/consumers and family feedback (28%)	**Stage implementation scale up**: This IS enabled in-depth examination of previous iterations of the program to determine successes and failures. **Model and simulate change**: Using data from previous implementations of SSBC we could develop a blueprint of SSBC implementation
Barriers								
Lack of physical resources to deliver SSBC (i.e., lack of gym facilities)		X		Inner Setting	Structural Characteristics (Physical infrastructure)	Change physical structure and equipment (32%)	Assess for readiness and identify barriers and facilitators (36%)	
Limited staff means capacity to deliver SSBC is restricted due to competing demands	X	X		Inner Setting	Structural Characteristics (Work infrastructure)	Identify and prepare champions (27%)	Assess for readiness and identify barriers and facilitators (36%) Create new clinical teams (9%) Promote network weaving (23%)	**Create new clinical teams**: By training new staff the strain of existing staff will be reduced.
At first glance delivery of SSBC seems overwhelming. Could negatively impact engagement	X	X	X	Innovation	Innovation Complexity	Capture and share local knowledge (27%) Create a learning collaborative (33%)	Develop implementation blueprint (43%) Facilitation (community of practice) (20%) Promote adaptability (40%)	

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Onboarding, quality assessment and evaluation data collection was a lot to complete and involved online tools new to many coaches		X	X	Individuals	Innovation Deliverers (Capability)	Conduct educational meetings (36%) Develop educational materials (36%)	Distribute educational materials (36%) Facilitation (20%) Identify and prepare champions (27%) Promote network weaving (23%) Provide clinical supervision (0%)	**Provide clinical supervision**: The RRC ensured data were collected
Training coaches								
Facilitators								
Coach training and testing ensured all SSBC coaches meet minimum standards to deliver SSBC - provides certification	X	X	X	Outer setting domain	Policies and Laws	Create or change credentialing and/or licensure standards (19%)		**Create or change credentialing and/or licensure standards**: Development of a SSBC coach certificate is key strategy to support implementation
Coach training provided staff with suitable knowledge to deliver SSBC	X	X	X	Individuals	Innovation Deliverers (Capability)	Develop educational materials (19%) Make training dynamic (41%) Shadow other experts (33%)	Conduct ongoing training (41%)	New 2022 CFRI construct. Used the self-efficacy construct matching to align with capability **Educational materials** were developed as part of training and used by coaches in previous SSBC implementations
Motivational interviewing skills were transferrable to other roles, this was a benefit of being an SSBC coach	X	X		Innovation	Relative Advantage	Capture and share local knowledge (17%)		**Capture and share local knowledge**: The added benefit of being an SSBC could be utilized through a community of practice
Practicing skills and gaining experience increased confidence to deliver SSBC	X	X		Individuals	Innovation Deliverers (Capability)	Create a learning collaborative (30%)	Conduct ongoing training (41%) Facilitation (22%) Remind clinicians (0%)	New 2022 CFRI construct. Used the self-efficacy construct matching to align with capability **Remind clinicians**: SSBC coaches were encouraged to use the checklists and scripts provided to assist with delivery

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Providing staff with feedback on their delivery helps improve implementation capability (particularly MI skills) and motivation to deliver the program		X	X	Individuals	Innovation Deliverers (Capability & Motivation)	Audit and provide feedback (8–22%)	Remind clinicians (0–4%)	New 2022 CFRI construct. Used the self-efficacy construct matching to align with capability and individual stage of change to align with motivation **Remind clinicians**: Staff reminded to complete documentation so that auditing and feedback could be provided.
Barriers								
Lack of buy-in to training negatively impacts success		X		Individuals	Innovation Deliverers (Motivation)	Alter incentive/ allowance structures (32%) Identify and prepare champions (44%)	Make training dynamic (40%)	New 2022 CFRI construct. Used individual stage of change to align with motivation
Training was initially perceived as overwhelming		X	X	Individuals	Innovation Deliverers (Capability)	Capture and share local knowledge (19%) Create a learning collaborative (30%)	Audit and provide feedback (22%)	New 2022 CFRI construct. Used the self-efficacy construct matching to align with capability **Capture and share local knowledge** through a CoP may help training feel less overwhelming
Delivery of SSBC								
Facilitators								
Provision of high quality, comprehensive delivery materials (i.e., manuals, checklists, scripts) supports implementation of SSBC	X			Innovation	Innovation Design	Develop educational materials (33%) Develop and implement tools for quality monitoring (30%)		
Sites had access to knowledge and information through provision of implementation support documents	X			Inner Setting	Access to knowledge and information	Develop educational materials (59%) Distribute educational materials (55%)	Develop implementation blueprint (14%)	All documents to support implementation are provided in the implementation blueprint

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Program structure supports clients habit formation in comparison to other programs	X			Innovation	Relative Advantage	Prepare patients/consumers to be active participants (0%)	Inform local opinion leaders (28%)	**Prepare patients/consumers to be active participants**: The program supports client habit formation by preparing patients to be active in their care by providing work books and delivering sessions with an MI informed counselling style.
Coaches were able to connect with clients due to extended one-on-one exercise and counselling time in comparison to other programs	X			Innovation	Relative Advantage	Capture and share local knowledge (17%)	Inform local opinion leaders (28%)	**Capture and share local knowledge**: The added benefit of being an SSBC could be utilized through a community of practice
Communication within sites supported implementation delivery both informally (through community of practice) and formally (through staff meetings)	X	X		Inner Setting	Communication	Create a learning collaborative (35%) Organize implementation team meetings (52%)	Capture and share local knowledge (26%) Facilitation (CoP) (26%) Promote network weaving (57%)	
Regular engagement with the research team and the site supported implementation	X	X		Inner Setting	Relational Connections	Create a learning collaborative (35%) Organize implementation team meetings (52%)	Promote network weaving (57%) Recruit designate and train for leadership (17%)	**Recruit, designate and train for leadership**: Recruiting the RRC was essential to ensure regular connection with the sites
Program consists of core content, however there is adaptability within each session for the coach to tailor the session to the clients needs. This encourages a client centered approach	X			Innovation	Adaptability	Promote adaptability (73%)	Tailor strategies (35%)	
Reflect upon the implementation process formally (i.e., data collection tools) and informally (i.e., regular meetings among the implementation and delivery teams)	X	X	X	Process	Reflecting & Evaluating	Purposely reexamine the implementation (28%)	Facilitation (20%) Obtain and use patients/consumers and family feedback (28%) Organize implementation team meetings (28%)	

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Shared belief among management that all fitness facilities staff should be SSBC coaches, representing a presumed culture at the facilities to support such programs	X			Inner Setting	Culture	Create a learning collaborative (30%)	Identify and prepare champions (52%)	
The knowledge that SSBC positively impacts their clients through program tools, structure, counselling style impacts implementation efforts and the delivery site	X			Individuals	Innovation recipients	Obtain and use patients/consumers and family feedback (76%)		New 2022 CFRI construct. Used patients/customers domain
Individuals who identified with the organization were committed to the success of SSBC - demonstrated through preparation, reflecting on skills, practicing skills	X			Individuals	Innovation Delivers (motivation)	Identify and prepare champions (44%)		New 2022 CFRI construct. Used individual stage of change to align with motivation
Provision of a central IT/data monitoring system to answer questions and concerns increases sites comfort using data collection and monitoring systems	X	X	X	Outer Setting	Local Conditions	Centralize technical assistance Use data warehousing techniques		New 2022 CFRI construct
Collect continual feedback on program implementation (i.e., recruitment, retention) and make adaptations as necessary during implementation	X	X	X	Innovation	Adaptability	Promote adaptability (73%) Purposely reexamine the implementation (12%)	Tailoring strategies (35%)	**Purposely reexamine the implementation**: this will occur through regular meetings and is deemed important for implementation success
Barriers								
Staff with high workloads have low motivation to engage with and deliver SSBC	X	X	X	Individuals	Innovation Deliverers (Motivation)	Alter incentive structure (32%) Create new clinical teams (0%)	Create a learning collaborative (28%)	New 2022 CFRI construct. Used individual stage of change to align with motivation **Create new clinical team**: To reduce workloads of current staff new individuals can complete the SSBC coach training

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
High coach turnover means lack of consistency for clients and shifting levels of buy-in	X	X		Inner Setting	Structural Characteristics (Work infrastructure)	Change accreditation or membership requirements (5%)		**Change accreditation or membership requirements**: Setting in internal change of requiring staff to commit to 6-months of SSBC implementation was a proposed IS to reduce turnover
Lack of senior staff championing SSBC negatively impacts staff engagement and recruitment	X	X		Individuals	Mid-level leaders (motivation)	Build a coalition (18%) Identify and prepare champion (41%)	Identify early adopters (9%)	**Build a coalition**: Establishing buy in from senior leadership at the start was a key IS. **Identify early adopters**: Deemed helpful in identifying those senior individuals who can support the change effort.
Lack of implementation lead negatively impacts buy in from other coaches and overall program success		X		Individuals	Opinion leader (motivation)	Identify and prepare champion (64%) Recruit, designate and train for leadership (21%)	Identify early adopters (43%) Provide clinical supervision (0%)	**Provide clinical supervision**: The RRC helped support delivery of the intervention at sites
Screening, onboarding and scheduling of participants requires significant personnel time for research support team. For sustainability these tasks need to be shifted to sites	X	X		Inner Setting	Access to knowledge and information	Conduct educational meetings (79%)	Develop educational materials (59%) Distribute educational material (55%)	

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Delivery of SSBC is complex, lots of preparation required ahead of delivering a session	X	X		Innovation	Innovation Complexity	Develop implementation blueprint (43%)	Organize clinician implementation team meetings (20%) Capture and share local knowledge (community of practice) (27%) Facilitation (CoP) (20%) Create a learning collaborative (33%) Promote adaptability (40%) Identify and prepare champions (30%)	
Overtime the level of MI delivered drops off such that is it not patient centered.	X	X		Individuals	Innovation Deliverers (Capability)	Conduct ongoing training (41%)	Shadow experts (33%) Make training dynamic (33%) Create a learning collaborative (30%) Facilitation (CoP) (22%)	New 2022 CFIR construct. Used self-efficacy to align with capability
SSBC Recruitment								
Facilitators								
Lunch and learns were more effective at gaining support. More effective when conducted after a local site had launched	X	X		Outer setting	Partnerships and connections	Conduct education outreach meetings (23%); Inform local opinion leaders (15%)	Develop implementation blueprint (4%)	**Develop implementation blueprint**: The blueprint outlines when exactly lunch should occur in the process of beginning implementation **Inform local opinion leaders**: During the education meetings information about the advantage and content of the program was shared to encourage recruitment efforts

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Research team provided a significant amount of support for recruitment to sites including: posters, pamphlets, radio, FB advertising. This helped pull in some folks	X	X		Process	Engaging (Innovation Recipients)	Mass media (41%)	Develop educational material (27%) Develop implementation blueprint (5%) Distribute educational material (18%) Inform local opinion leaders (5%) Tailor strategies (9%)	**Tailor strategies**: Recruitment material was tailored to sites **Inform local opinion leaders**: Engaged with these individuals to support the recruitment effort and share recruitment material **Develop implementation blueprint**: The blueprint outlined that various recruitment materials **Distribute educational material**: Sharing recruitment materials directly with sites to support their recruitment was deemed important
Health Assessment Days were good at raising awareness about SSBC, plus help individuals identify whether they are at risk of T2D (Must ensure they are done close in time to launching SSBC at the site to gain momentum)		X	X	Process	Engaging (Innovation Recipients)	Intervene with patients/consumers to enhance uptake and adherence (50%)		New 2022 CFRI construct - using patients/customers
Recruitment through laboratories following a clinical diagnosis of prediabetes is successful				Outer setting	Partnerships & connections	Build a coalition (62%) Use capitated payments (0%)		**Use capitated payments**: Labs paid on a per client basis for referral to the program as a recruitment strategy
Sites actively engaging in partnership building in their community to assist with the recruitment effort as perceive recruitment as key to their project role		X	X	Outer Settings	Partnerships & connections	Promote network weaving (50%)	Use advisory boards and workshops (35%)	
Barriers								

Table 1 (continued)

Source								
Barrier or Facilitator Identified	2017–2022 Interior BC SSBC Delivery ($n=3$)	2023–2024 Rural BC SSBC Delivery ($n=5$)	2024 - Present Pan-Canadian SSBC Delivery	CFIR Domain	CFIR Construct	Primary Implementation Strategies	Secondary Implementation Strategies	Rationale if not in matching tool
Overall struggle to recruit participants into the program		X		Process	Engaging (Innovation Recipients)	Intervene with patients/consumers to enhance uptake (50%)	Alter patient/consumer fees (23%) Develop educational materials (27%) Distribute educational materials (18%) Mass media (41%) Obtain and use patients/consumers and family feedback (41%)	**Distribute educational material**: Sharing recruitment materials directly with sites to support their recruitment was deemed important
Lunch and learns with HCPs help with recruitment. However, physicians are more likely to assist with recruitment if they get feedback on progress of their referrals through SSBC.	X	X		Outer Setting	Partnerships and connections	Conduct education outreach meeting (23%) Facilitate relay of clinical data to providers (0%)		**Facilitate relay of clinical data to providers**: Sharing the impact of SSBC with clinicians was a highlighted strategy as support clinicians engagement.
SSBC advertised as a DPP. Many folks think the program does not apply to them if they see an advertisement or it is not a priority.		X		Process	Engaging (Innovation Recipients)	Intervene with patients/consumers to enhance uptake and adherence (50%)	Develop educational materials (27%) Distribute educational materials(18%)	New 2022 CFRI construct - used patients and customers domain Distribution of educational material is important to reach folks
People (potential participants) may not come into town or go to the fitness center in rural locations		X		Process	Engaging (Innovation Recipients)	Mass media (41%)	Develop educational materials (27%) Distribute educational materials(18%)	New 2022 CFRI construct - used patients and customers domain **Distribute educational material**: Sharing recruitment materials directly with sites to support their recruitment was deemed important
Generalized recruitment material that has not been adapted for the context is not appealing to participants		X		Process	Engaging (Innovation Recipients)	Promote adaptability (5%)		New 2022 construct - used patients' and customers domain **Promote adaptability**: Sites encouraged to change material to fit their needs

additional barriers and facilitators identified in Projects 2 and 3, were all matched to the CFIR domains (JB). Intermittently, JB met with a second researcher NG to discuss matching, decisions made, and to resolve any discrepancies that arose.

Step 3. Match Implementation Determinants to Implementation Strategies

To identify appropriate implementation strategies to mitigate barriers to implementation or support implementation, the CFIR-ERIC (Powell et al., 2015) matching tool (Waltz et al., 2019) was used. The CFIR constructs were matched to implementation strategies using the percentage value of suggested strategies identified in the tool. The percentage value reflects the proportion of implementation science experts ($n=169$) who endorsed a strategy as being a 'top seven' strategy to address that construct. Strategies with 20% to 49.9% of respondents are considered Level 2, higher than 50% are considered Level 1. The linked percentage value acted as a guide for the selection of strategies. Two researchers (JB, NG) scrutinized each 'link' to determine the extent to which they felt the specific strategy would be effective and feasible to target the factor identified. Where the strategies selected was below a Level 2 of endorsement among implementation science experts, a justification for the selection of that strategy was provided. The selection of strategies was done independently by two researchers (JB, NG). The researchers met to discuss discrepancies. A third researcher was brought in to further discuss discrepancies that could not be resolved when needed. Step 3 resulted in a list of strategies for use in the current project that had the potential to address the identified implementation factors. The authors (JB, NG, AG) identified one or two strategies considered most effective in addressing the identified barrier or facilitator associated with SSBC (i.e., the primary strategy) and secondary strategies were those that could be used to target the factors identified but were not specifically selected for that purpose.

Step 4: Operationalizing Implementation Strategies

To further define each implementation strategy, the selected ERIC implementation strategies were operationalized to provide specific contextual information. Specifically, one researcher (NG) operationalized the implementation strategies by specifying the (1) action involved and how the strategy is delivered/executed, (2) the resource needed to support the strategy, (3) the actor to deliver the strategy, (4) the temporality; when and in which phase of the project the strategy will be used and (5) the implementation outcome(s) targeted by that strategy (Proctor et al., 2013). An additional dimension of operationalizing strategies includes providing the rationale for the selection of the strategy; this specification was addressed earlier in steps 1 through 3. The strategy operationalization was reviewed by a second researcher (JB), where edits and consensus discussions were had to create a finalized version of the operationalization spreadsheet.

Step 5: Creating the Implementation Blueprint

Once the strategies were operationalized into a comprehensive spreadsheet, a user-friendly implementation blueprint was created for implementation partners outside the research lab to assist with planning and program delivery. The digestible blueprint included the project goals, the roles and responsibilities of individuals involved in the project, and an outline of strategies that can be used to help facilitate successful program delivery. This blueprint was shared with each urban YMCA delivery site during an initial adaptation workshop before launching the program in their community.

Step 6: Creating a Resource Toolkit to Support the Implementation

The tools proposed in Step 4 to support the delivery and execution of each identified strategy were created. Two versions of a toolkit were developed by (NG) which outlined various resources that were provided to each site (Site Toolkit) and accessed by the research team (Research Team Toolkit). Several of the proposed tools needed to be created by the research team to help ensure each of the strategies could be successfully performed. Some of these tools had already been developed for the previous initial implementation sites (such as the online coach training), others needed minor editing, and a number of tools needed to be created specifically for the purpose of this project (e.g., guiding principles document, data management manual, tracking sheets, etc.).

Step 7: Develop a Tracking System for Implementation Strategy Use Throughout the Project

Understanding the use or adaptation of strategies across sites is essential to understand their impact on the effectiveness of evidence-based interventions (Chambers & Norton, 2016). To achieve this, a comprehensive activity tracking tool was created to capture activities associated with implementation strategies across multiple sites. The development of the current strategies tracking system was guided by the work of Bunger and colleagues (2017) and Walsh Bailey and colleagues (2021). Activity logs are moderately structured, in comparison to brainstorming logs which have

limited structure, or detailed tracking logs (Walsh-Bailey et al., 2021), and provide a practical and feasible means of tracking project-related activities (Bunger et al., 2017). A draft tool was created by one author (JB) and reviewed by DPRG to offer edits and changes to enhance clarity and efficiency of the activity log process ahead of implementation.

Results

Step 1. Context Assessment

The context assessment revealed 41 facilitators and 18 barriers to the implementation of SSBC across the three projects. Together these three projects represent the delivery, or imminent delivery, of SSBC in 13 locations across Canada in urban and rural settings. The factors influencing implementation were separated into those associated with the pre-implementation of SSBC delivery (18 facilitators and 6 barriers) coach training (5 facilitators and 2 barriers), factors related to the implementation of SSBC including client recruitment (5 facilitators and 5 barriers) and SSBC content delivery (13 facilitators and 7 barriers). Table 1 outlines the barriers and facilitators identified and the sources of these factors across the three projects. Pre-implementation barriers and facilitators were identified in similar quantity across all three projects. Implementation determinants were largely identified through projects 1 and 2. This is unsurprising given that Project 3 is currently in the pre-implementation phase of delivery.

Step 2. Map Implementation Barriers and Facilitators to Implementation Determinants

In the pre-implementation and implementation phases, all five CFIR domains were identified as impacted by SSBC implementation. Several barriers were related to the inner setting and individual domains both in pre-implementation and implementation. In the inner setting domain, this included constructs of structural characteristics and access to knowledge and information. Constructs in this domain linked with planning facilitators included relational connectedness, communication, compatibility, high-level leaders' motivation, and culture. For example, *a belief that SSBC is a good fit for the delivery site and staff are well suited to deliver the program* (Inner setting; Compatibility; was identified across all three projects). In the individual domain, the constructs of innovation deliverers and opinion leaders' capability and motivation were both barriers and facilitators to implementation. For example: *Training was initially overwhelming* (implementation barrier), and *practicing skills and gaining experience increased confidence to deliver SSBC* (implementation facilitator) both resided in the individual domain representing the construct of innovation deliverers capability. Several constructs in the innovation domain facilitated SSBC delivery including innovation design, relative advantage, and adaptability. However, the complexity of the innovation was a perceived barrier to implementation. Determinants residing in the outer setting domain were primarily regarded as facilitators of implementation and included the constructs of local attitudes, partnerships and connections, peer pressure, policies and laws, local conditions, and financing. It is possible that these outer setting factors were resolved before receiving grant funding for the implementation of SSBC in these urban locations and therefore they facilitated SSBC implementation. Factors residing in the process domains were largely facilitators to implementation and were primarily identified in the pre-implementation phase. These included the constructs of planning, assessing context, engaging, doing, reflecting, and evaluating. However, the barrier of engaging innovation recipients was identified through several barriers associated with the recruitment of clients for example *generalized recruitment material that has not been adapted for the context is not appealing to participants.* See Table 1 for a complete list of the barriers and facilitators identified and their match to the CFIR domains.

Step 3. Match Implementation Determinants to Implementation Strategies

The 28 constructs and 7 subconstructs from the most recent CFIR (Damschroder et al., 2022) were mapped to 54 unique implementation strategies. Of these 54 strategies, 46 were identified as primary strategies to target the barriers and facilitators identified as part of the SSBC Urban Scale Up. The strategies most commonly identified for use within this project are: *develop educational materials*, *conduct educational meetings*, *create a learning collaborative*, *capture and share local knowledge* and *identify and prepare champions.* While the majority of strategies use occurrence was matched based on the CFIR/ERIC matching tool there were occasions when no matches were identified but the researchers felt that implementation strategy was important. For example, to address the barriers to staff having high workloads, leading to low motivation to engage and deliver SSBC (CFIR domain: Individuals, Construct: Innovation Deliverers, Role Subdomain: Motivation), the implementation strategy of *Create new clinical teams* was identified as important. Specifically, to reduce the workload on the site staff, bringing new members to the team was deemed a potentially useful strategy, despite the CFIR/ERIC match identifying that strategy as 0% match for the identified domains (see Table 1).

Table 2 Operationalization of SSBC IS

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Audit and provide feedback	Collect and summarize clinical performance data over a specified time period and give it to clinicians and administrators to monitor, evaluate, and modify provider behavior	Staff audio-record each session and research staff review randomly selected sessions during site audits to assess for motivational interviewing skills and program fidelity. To assess program and MI fidelity, staff will complete session-specific checklists after each session documenting what was delivered to their client. Feedback will be provided to coaches through evaluation reports during bi-annual audits. Feedback about coach training success rate and associated challenges and successes will be shared when appropriate.	Evaluation Report Template; Fidelity Schedule; Recoding and translation tool (Otter.ai), data collection tool (REDcap)	DPRG and RRCs	Implementation & Sustainability	Fidelity; Feasibility
Build a coalition	Recruit and cultivate relationships with partners in the implementation effort	During the planning process a scale-up team was formed to recruit and cultivate relationships with partners who supported the vision of improving access to diabetes prevention care in their community. This team consists of an Advisory Committee, Steering Committees, YMCA Managers and Municipality Partners who hold a shared vision to support the community. Partnerships with blood laboratories and physician offices will be created to help facilitate recruitment efforts.	Recruitment and Educational Materials	DPRG	Pre-Implementation	Penetration; Adoption
Capture and share local knowledge	Capture local knowledge from implementation sites on how implementers and clinicians made something work in their setting and then share it with other sites	Local knowledge from implementation sites will be shared at implementation team meetings: topics discussed will include the barriers and facilitators to SSBC delivery, lessons learned and strategies for improvement. Local knowledge will be collected by the site lead (SL) and regional research coordinator (RRC) through meeting minutes, discussed/presented at the annual team event and shared through RRC, SL and SSBC coach meetings and through the virtual communities of practice (VCoP). An implementation strategies toolkit was provided to each site to help facilitate and support delivery at their site. A mentorship program was created to connect SLs at new sites with existing sites.	Implementation Strategies Toolkit, Tracking sheets for meeting notes templates, Mentorship Program, VCoP, SL Network	SLs, DPRG and RRCs	Implementation & Sustainability	Fidelity; Feasibility; Sustainability
Centralize technical assistance	Develop and use a centralized system to deliver technical assistance focused on implementation issues	Designated RRCs will assist the implementation efforts and be the point of contact for SLs. Contact information and communication protocols wills be provided to each site in a Standard Operating Procedures (SOP) document. Additionally, the Data Manager assisted with the technical components of the program, specifically related to the client consenting process and data collection.	SL SOP	DPRG and RRCs	Implementation & Sustainability	Fidelity; Feasibility; Acceptability
Conduct educational meetings	Hold meetings targeted toward different stakeholder groups (e.g., providers, administrators, other organizational stakeholders, and community, patient/consumer, and family stakeholders) to teach them about the clinical innovation	RRCs will be asked to meet with local health care providers (HCPs), pharmacies and local community organizations to aid in recruitment efforts. The annual team event will be used to provide updates to study progress, distribute results and share successes/challenges about SSBC delivery to the entire SSBC Urban Scale Up Team. RRCs and the research team will hold educational workshops for SSBC coaches and YMCA staff to assist with on-site recruitment.	Recruitment and Educational Materials	DPRG and RRCs	Pre-Implementation & Implementation	Penetration; Adoption

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Conduct educational outreach visits	Have a trained person meet with providers in their practice settings to educate providers about the clinical innovation with the intent of changing the provider's practice	RRCs will organize information sessions such as "Lunch and Learns" with HCPs to educate practitioners about the program, promote recruitment and review processes for referring eligible patients.	Recruitment and Educational Materials; HCP PowerPoint	DPRG and RRCs	Pre-Implementation & Implementation	Penetration: Adoption
Create a learning collaborative	Facilitate the formation of groups of providers or provider organizations and foster a collaborative learning environment to improve implementation of the clinical innovation	SL will lead regular meetings with all program delivery staff to encourage collaboration and community among SSBC coaches. A VCoP was developed to connect SSBC coaches from across sites and encourage continued learning. Each site will participate in an adaptation and implementation workshop with the research team to prepare for delivery of the program prior to launching SSBC. A mentorship program and SL Network over Microsoft Teams will be established with attempts to support SLs and encourage learning at the management and implementation level.	Meetings Blueprint, SL SOP, VCoP, SL Network, Mentorship Program, Adaptation Workshop	DPRG & SLs	Pre-Implementation, Implementation & Sustainability	Fidelity; Feasibility
Develop a formal implementation blueprint	Develop a formal implementation blueprint that includes all uals and strategies. The blueprint should include the following: (1) aim/purpose of the implementation; (2) scope of the change (e.g., what organizational units are affected); (3) timeframe and milestones; and (4) appropriate performance/progress measures. Use and update this plan to guide the implementation effort over time	An implementation plan was created to support the program: including a description of the short- and long-term goals, roles and responsibilities, outcomes, phases, and implementation strategies for the project to support successful delivery. This plan was presented to all sites during the Adaptations Workshop to share implementation plans and collect feedback from partners.	Formal Implementation Blueprint, Digestible Implementation Plan for Sites, Implementation Toolkit	DPRG	Pre-Implementation	Fidelity; Feasibility
Develop academic partnerships	Partner with a university or academic unit for the purposes of shared training and bringing research skills to an implementation project	The SSBC program developed by [PI] and the Diabetes Prevention Research group at UBC partnered with co-investigators at a number of institutions for this project: including the University of British Columbia, University of Queensland, Deakin University, Brock University, Universite Laval, Memorial University of Newfoundland and Labrador, McMaster University, University of Manitoba, Universite of Sherbrooke, University of New Castle, Simon Fraser University, and University of Toronto. RRCs were hired onto the project from ARC, McMaster and MUN to support research activities and implementation.		DPRG	Pre-Implementation	Adoption; Sustainability

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Develop and implement tools for quality monitoring	Develop, test, and introduce into quality-monitoring systems the right input—the appropriate language, protocols, algorithms, standards, and measures (of processes, patient/consumer outcomes, and implementation outcomes) that are often specific to the innovation being implemented	Session-specific fidelity checklists were developed for staff to complete after every session. A protocol for data collection and evaluation was created by the research team, SSBC coaches will be instructed to audio-record every client session.	Session Checklists, REDCap, Otter.ai	DPRG, RRCs and SLs	Pre-Implementation & Implementation	Fidelity
Develop educational materials	Develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about the innovation and for clinicians to learn how to deliver the clinical innovation	Develop SOPs, provide access to coach training (educational content), develop implementation blueprint and implementation resource toolkit to help coaches and sites learn about how to deliver the program. Educational videos on program content were created as part of the coach training resources. All staff were given ongoing access to videos on an online training platform and the VCoP. Documents to support and educate RRC's on running an effective recruitment campaign were provided in the implementation strategies toolkit.	SL SOP, Coach Training modules, Final Steps Training, VCoP, IS toolkit, IS blueprint	DPRG	Pre-Implementation	Adoption; Feasibility; Fidelity; Acceptability
Distribute educational materials	Distribute educational materials (including guidelines, manuals, and toolkits) in person, by mail, and/or electronically	Educational materials were provided electronically to each site and RRC to be distributed as needed. Client workbooks and site SOPs were sent to each site by mail.	SL SOP, Coach Training modules, Final Steps Training, VCoP, IS toolkit, IS blueprint, Client Workbooks	DPRG, RRCs and SLs	Pre-Implementation	Adoption; Feasibility; Fidelity; Acceptability
Identify and prepare champions	Identify and prepare individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in an organization	Identified and trained one lead per site to oversee and support coaching staff, liaise with the research team, champion the program, and increase organizational readiness to deliver the program. Three regional research coordinators were hired and trained to oversee their regional sites and liaise with SLs, staff and the DPRG.	SL SOP, RRC SOP	DPRG and RRCs	Pre-Implementation; Implementation (if needed due to staff turnover)	Adoption; Fidelity; Feasibility; Appropriateness; Sustainability
Identify early adopters	Identify early adopters at the local site to learn from their experiences with the practice innovation	Identify early adopters at each site by asking the SL if any staff may be a good fit and are interested to be a coach for the program. These staff took the coach training early, participated in the adaptation workshops, and were active members of the VCoP.	Adaptation Workshop, VCoP	DPRG, RRCs and SLs	Pre-Implementation	Adoption; Fidelity; Sustainability

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Make training dynamic	Vary the information delivery methods to cater to different learning styles and work contexts, and shape the training in the innovation to be interactive	Innovative and interactive coach training was delivered through online training platform. This included a variety of learning methods such as role-play, how-to videos, educational modules, knowledge checks, and skill demonstrations. Additional ongoing access to the online training included access to resource center documents and the VCoP. If coaches had trouble passing their mock session to demonstrate their skills, additional 1:1 support was provided by the DPRG. Training for RRCs was provided by DPRG as well as regular meetings to provide support.	Coach Training, Final Steps Training, VCoP	DPRG	Pre-Implementation & Implementation (as new coaches are onboarded)	Fidelity
Obtain and use patients/consumers and family feedback	Develop strategies to increase patient/consumer and family feedback on the implementation effort	SSBC alumni were offered opportunities to participate in satisfaction surveys after completing the SSBC program. Throughout the program, clients were provided surveys that collected program outcomes and feedback at multiple time-points. Every 6 months, rates of satisfaction and changes in health outcomes of clients who have completed the program will be reported back to SLs, coaches and the entire scale-up team. Qualitative interviews will be conducted post-program to gain additional insights on program feedback and experience. Patient partners were also involved through the project and sat on the committees to provide input and feedback.	REDCap (client surveys)	DPRG	Implementation & Sustainability	Fidelity; Acceptability; Sustainability
Organize clinician implementation team meetings	Develop and support teams of clinicians who are implementing the innovation and give them protected time to reflect on the implementation effort, share lessons learned, and support one another's learning	SLs will lead regular meetings with all program staff, these meetings will provide an opportunity for coaches to reflect on lessons learned, discuss successes/challenges encountered and support one another's learning. A blueprint outlining planned meetings throughout the project will be included in both the SL SOP and RRC SOP. SLs are expected to meet with RRCs regularly, and RRCs are expected to meet with the DPRG project coordinator weekly for updates.	SL SOP, RRC SOP	DPRG, RRCs and SLs	Implementation	Fidelity; Sustainability: Acceptability
Promote adaptability	Identify the ways a clinical innovation can be tailored to meet local needs and clarify which elements of the innovation must be maintained to preserve fidelity	During the SSBC coach training, staff were taught to deliver core program content in a client-centered manner, providing flexibility on delivery to meet the needs of the client. Key program content must be provided to each client but can be tailored to the client (e.g., order of content delivery, goals and exercise preferences). SLs were provided with a list of core components during the adaptation workshops prior to discussing necessary context-specific adaptations to ensure the needs of the program, delivery team, and local community were met. The research team will track adaptations through meeting minutes and REDCap surveys, collecting data from RRC, SL, and annual scale-up meetings.	SL SOP, RRC SOP-core components, Adaptation Workshop, IS Tracking Tool, Tracking sheets, REDCap	DPRG, RRCs and SLs	Pre-Implementation, Implementation & Sustainability	Sustainability; Fidelity
Purposely reexamine the implementation	Monitor progress and adjust clinical practices and implementation strategies to continuously improve the quality of care	Implementation strategies will be reviewed at monthly site meetings and adaptations will be made as needed/when possible. Adaptations to the program and coach training will also be monitored and discussed to tailor delivery based on the needs of each site and improve the quality of delivery.	IS Tracking Tool, Tracking sheets	DPRG	Implementation	Fidelity; Sustainability; Feasibility; Appropriateness

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Shadow other experts	Provide ways for key individuals to directly observe experienced people engage with or use the targeted practice change/innovation	Videos were created by senior research staff demonstrating program delivery. As part of the training modules, all staff will view segments of these videos, full-length videos were available in the resource center of the online training platform. Coaches will be encouraged to watch the full-length videos to understand and learn the flow of each session.	Coach training	DPRG	Pre-Implementation	Fidelity
Stage implementation scale up	Phase implementation efforts by starting with small pilots or demonstration projects and gradually move to a system wide rollout	The urban scale-up project will follow a phased approach of initial implementation at 11 regional sites followed by implementation of 33 expansion sites in those 11 regions. Each site will also be offered the opportunity to "soft launch" (for example, promote to a limited audience before a full-scale launch of the program and recruitment efforts) the SSBC program based on readiness, timing and resources.	Adaptation Workshop	DPRG	Pre-Implementation	Adoption; Appropriateness
Tailor strategies	Tailor the implementation strategies to address barriers and leverage facilitators that were identified through earlier data collection	Data collected from previous SSBC sites (barriers and facilitators to delivery) was used to select and tailor the IS used in this urban scale up project. IS will be further tailored and adapted throughout the project based on feedback collected in RRC and SL meetings to ensure SSBC is a good fit for each delivery site. This data will be collected through meeting minutes and REDCap surveys.	REDCap, Tracking sheets	DPRG and RRCs	Pre-Implementation, Implementation & Sustainability	Adoption; Appropriateness; Acceptability; Sustainability
Use advisory boards and workgroups	Create and engage a formal group of multiple kinds of stakeholders to provide input and advice on implementation efforts and to elicit recommendations for improvements	Several working groups were established including an advisory committee and three steering committees (Sex and Gender and Inclusivity, Program Evaluation and the Diabetes Prevention Engagement Committee) to provide expertise, input and advice for decisions related to the implementation effort. Feedback collected in meetings across these working groups was used in project planning and presented back to the entire scale-up team annually. This feedback will help inform where necessary changes and improvements to implementation and sustainability can be made. SSBC alumni sit on the steering committees and will be asked to provide feedback on intervention content and implementation tools (e.g., recruitment letters, client workbooks, and client surveys).	Governing Principles	DPRG, RRCs and SLs	Pre-Implementation, Implementation & Sustainability	Fidelity; Sustainability; Acceptability; Appropriateness
Access new funding	Access new or existing money to facilitate the implementation	[PI] secured grants to fund the scale up of SSBC to 44 sites in Canada.		DPRG	Pre-Implementation	Implementation Costs
Alter incentive/allowance structures	Work to incentivize the adoption and implementation of the clinical innovation	SSBC clients who participate in the program will attend local YMCA facilities, this will bring more community members through YMCA facilities, increasing the likelihood for SSBC clients to purchase a YMCA membership post-program. YMCA locations will receive funding to pay delivery staff to complete the SSBC coach training and deliver client sessions as part of the formal service agreement. SSBC clients will be incentivized to join the program as it is free of cost and includes a YMCA membership for the duration of their SSBC sessions.	Service Agreement Template	DPRG	Pre-Implementation & Implementation	Adoption; Penetration; Implementation Costs

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Alter patient/consumer fees	Create fee structures where patients/consumers pay less for preferred treatments (the clinical innovation) and more for less-preferred treatments	There will be no cost for SSBC clients who participate in the program. The 6 SSBC sessions are free of charge and are comparable to the equivalent of 6 personal training sessions at YMCA locations, therefore SSBC clients are paying less for a program that is more specific to their T2D risk and health needs. A letter of support was signed by sites agreeing to offer a Y membership in kind to SSBC participants.	Service Agreement Template, Letter of Support	DPRG	Pre-Implementation	Penetration; Implementation Costs
Assess for readiness and identify barriers and facilitators	Assess various aspects of an organization to determine its degree of readiness to implement, barriers that may impede implementation, and strengths that can be used in the implementation effort	Organizational readiness will be measured by REDCap surveys administered to SLs and coaches to inform the degree of readiness to implement at their YMCA location. Barriers that may impede implementation and strengths that can facilitate implementation will be collected during the adaptation workshop prior to program launch. Additional data will be collected on organization capacity, staff capacity and space.	Adaptation Workshop, REDCap	DPRG	Pre-Implementation	Fidelity; Appropriateness; Feasibility
Change physical structure and equipment	Evaluate current configurations and adapt, as needed, the physical structure and/or equipment (e.g., changing the layout of a room, adding equipment) to best accommodate the targeted innovation	Changes regarding the physical structure and necessary equipment at various sites will be discussed with SLs during the adaptation workshops to best accommodate SSBC delivery at each specific site. Necessary resources will be sent to each site by the research team.	Adaptation Workshop, Supplies Package	DPRG & RRCs	Pre-Implementation	Fidelity; Feasibility; Appropriateness
Conduct local consensus discussions	Include local providers and other stakeholders in discussions that address whether the chosen problem is important and whether the clinical innovation to address it is appropriate	Municipality partners and principal knowledge users were engaged in conversations to address whether SSBC would be an appropriate intervention for their communities/organization and discussed the relative benefit of delivering SSBC in their communities. A letter of support with each site was signed after this point.	Letter of Support	DPRG	Pre-Implementation	Adoption; Appropriateness
Conduct ongoing training	Plan for and conduct training in the clinical innovation in an ongoing way	As the site identifies additional staff that would like to become SSBC coaches, they will receive access to the self-paced online modules. Ongoing training will be provided to SSBC coaches and SLs through optional booster session workshops, continued access to resources housed on the online training platform, and access to a VCoP. These resources will allow coaches to connect and collaborate about the program and support delivery as intended. Financial assistance will be offered to coaches that have ideas about how to network, enhance learning or refine skills among the coach community.	Coach Training, VCoP, Educational Materials	DPRG & RRCs	Implementation & Sustainability	Fidelity; Acceptability

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Create new clinical teams	Change who serves on the clinical team, adding different disciplines and different skills to make it more likely that the clinical innovation is delivered (or is more successfully delivered)	There are no educational requirements to become an SSBC coach. This allows for a variety of community lay personnel, including fitness facility staff, personal trainers, practicum students, volunteers and SSBC alumni the opportunity to become coaches. The process of certification is the same for each coach. The individuals who serve on the project steering committees, research team and SSBC delivery staff have various expertise and come from different disciplines. These diverse skills and perspectives make it more likely for the program to be delivery successfully and effectively adapted	Governing Principles, Coach Training	DPRG	Pre-Implementation, Implementation & Sustainability	Fidelity; Sustainability; Adoption
Create or change credentialing and/or licensure standards	Create an organization that certifies clinicians in the innovation or encourage an existing organization to do so. Change governmental professional certification or licensure requirements to include delivering the innovation. Work to alter continuing education requirements to shape professional practice toward the innovation	SSBC certification will be awarded to those who successfully completed the coach training program. Only certified coaches will be eligible to deliver the SSBC program to clients in the community. The research team will work with YMCAs and provincial credentialing organizations to have the SSBC coach training course also qualify for continuing education credits for YMCA staff.	Coach Training	DPRG	Pre-Implementation, Implementation & Sustainability	Fidelity; Adoption
Develop an implementation glossary	Develop and distribute a list of terms describing the innovation, implementation, and stakeholders in the organizational change	An implementation outline was created and will be included in both the implementation blueprint and governing principles document to describe the program, implementation goals, IS, and roles of individuals involved in the implementation effort.	Governing Principles; IS Blueprint; SL SOP, RRC SOP	DPRG	Pre-Implementation	Fidelity; Feasibility; Sustainability
Develop and organize quality monitoring systems	Develop and organize systems and procedures that monitor clinical processes and/or outcomes for the purpose of quality assurance and improvement	Quality monitoring systems and processes were put in place to assure quality assurance and program improvement. Examples include fidelity checks, survey data from clients, interview data from coaches, clients and SLs and an established communication process.	Communication Process, RRC SOP, Fidelity Blueprint, REDCap, Tracking Spreadsheets (meeting notes)	DPRG & RRCs	Pre-Implementation	Fidelity; Sustainability
Develop resource sharing agreements	Develop partnerships with organizations that have resources needed to implement the innovation	Partnerships were established with various YMCA locations that had the interest and resources needed to implement the program and uphold its core components. Service agreements were signed by each location and the research team to provide a shared understanding of the partnership and transparency of expected roles, timelines, responsibilities and available resources.	Service Agreement Template	DPRG	Pre-Implementation	Adoption; Fidelity

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Facilitation	A process of interactive problem solving and support that occurs in a context of a recognized need for improvement and a supportive interpersonal relationship	Interactive problem-solving was encouraged and supported through regular staff meetings with coaches, SLs and RRCs and during the annual team meeting. A VCoP was offered to support coaches through the celebration of success and help eachother problem solve any potential implementation challenges. Additional meetings with project managers and YMCA senior staff will help facilitate problem solving and support efforts.	VCoP, SL SOP, RRC SOP	DPRG & RRCs	Pre-Implementation, Implementation & Sustainability	Fidelity; Feasibility; Acceptability; Sustainability
Inform local opinion leaders	Inform providers identified by colleagues as opinion leaders or "educationally influential" about the clinical innovation in the hopes that they will influence colleagues to adopt it	Representatives from community organizations and health authorities were contacted to assist in program recruitment and, if willing, will be asked to share information about program success and client satisfaction with their colleagues. YMCA managers/staff and SSBC alumni will be encouraged to assist in recruitment and program delivery by offering location-specific insight into their community context and preferences on recruitment methods and community values.	Recruitment and Educational Materials	DPRG & RRCs	Pre-Implementation, Implementation & Sustainability	Penetration; Adoption (providers not site)
Involve executive boards	Involve existing governing structures (e.g., boards of directors, medical staff boards of governance) in the implementation effort, including the review of data on implementation processes	A governing structure was created (during the pre-implementation phase) including an advisory committee, three steering committees (Sex & Gender and Inclusivity, Diabetes Prevention Engagement and Program Evaluation) and a research team. These teams will review relevant measures for data collection, research initiatives and implementation progress throughout the project.	Governing Principles, Data Management Manual	DPRG	Pre-Implementation, Implementation & Sustainability	Penetration; Sustainability; Feasibility
Involve patients/consumers and family members	Engage or include patients/consumers and families in the implementation effort	SSBC alumni and individuals with lived and living experience will be involved in the implementation effort to ensure engagement with client perspectives is included. SSBC alumni and individuals with lived experience roles were established in each of the steering committees. If interested, SSBC alumni were also invited to become SSBC coaches to assist in the delivery of the program. Feedback from SSBC clients was collected through acceptability and satisfaction surveys and post program interviews.	Governing Principles, REDCap	DPRG	Pre-Implementation, Implementation & Sustainability	Adoption; Acceptability; Feasibility; Sustainability
Model and simulate change	Model or simulate the change that will be implemented prior to implementation	Initial community implementation of the SSBC program started in Kelowna, British Columbia in 3 urban sites and expanded to 5 rural locations in British Columbia. Barriers and facilitators to implementation in these locations and lessons learned about scaling out in these initial sites informed the selection of IS used in the urban scale up initiative.		DPRG	Pre-Implementation	Adoption; Penetration; Fidelity, Sustainability; Appropriateness
Obtain formal commitments	Obtain written commitments from key partners that state what they will do to implement the innovation	Written commitments in the form of formal Letters of Support and service agreements were signed by all sites committed to delivering the SSBC program at their YMCA location.	Service Agreement Template, Letters of Support	DPRG	Pre-Implementation	Appropriateness; Fidelity; Implementation Costs

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Prepare patients/ consumers to be active participants	Prepare patients/consumers to be active in their care, to ask questions, and specifically to inquire about care guidelines, the evidence behind clinical decisions, or about available evidence-supported treatments	SSBC client will be provided program workbooks during session one. Sessions are delivered using an MI-informed counselling style to ensure the program is client-centered and encourages their autonomy and likelihood they will take an active role in their health.	Client Workbooks, SSBC Coach Training	DPRG	Pre-Implementation	Fidelity
Promote network weaving	Identify and build on existing high-quality working relationships and networks within and outside the organization, organizational units, teams, etc. to promote information sharing, collaborative problem-solving, and a shared vision/goal related to implementing the innovation	A mentorship program was established so that successes and challenges of implementation could be shared between sites. The SSBC Network on Teams, and coach forum, will allow for delivery staff to collaborate, learn, share ideas and problem-solve. SLs are encouraged to engage with their community to assist with recruitment efforts. Open lines of communication will be encouraged between sites.	SL SOP, RRC SOP	DPRG, RRCs and SLs	Pre-Implementation, Implementation & Sustainability	Fidelity; Acceptability
Provide clinical supervision	Provide clinicians with ongoing supervision focusing on the innovation. Provide training for clinical supervisors who will supervise clinicians who provide the innovation	RRCs will provide a SL Orientation to each YMCA staff that is identified as a SSBC SL. SLs who oversee the delivery of the SSBC program at their prospective YMCA location will be supported by the RRCs through all stages of the implementation process. SLs will be provided with a standard operating procedures document to assist them with their supervision role. The SL will be the main point of contact for each YMCA location.	Site SOP SL Orientation Presentation	DPRG, RRCs and SLs	Pre-Implementation	Fidelity; Sustainability; Adoption
Provide ongoing consultation	Provide ongoing consultation with one or more experts in the strategies used to support implementing the innovation	The research team will be involved throughout program delivery and provide ongoing consultation to help support the delivery through meetings and the VCoP.	VCoP, IS Blueprint, IS Toolkit, Regular Meetings	DPRG	Pre-Implementation, Implementation	Fidelity
Remind clinicians	Develop reminder systems designed to help clinicians to recall information and/or prompt them to use the clinical innovation	SSBC coaches/delivery staff will be prompted to deliver the program as intended through the use of REDCap session checklists and data collection reminders. Additional reminder systems will include booster training workshops, the VCoP, monthly meetings, and SL supervisors.	REDCap, VCoP, SL SOP	DPRG, RRCs and SLs	Implementation & Sustainability	Fidelity
Use capitated payments	Pay providers or care systems a set amount per patient/consumer for delivering clinical care	Grant funding was secured to pay delivery staff including RRCs, SLs/ managers and SSBC coaches. Paid partnerships in the community will facilitate recruitment efforts through blood laboratories.		DPRG	Pre-Implementation, Implementation & Sustainability	Fidelity; Adoption; Penetration; Appropriateness, Implementation Costs

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Use data experts	Involve, hire, and/or consult experts to inform management on the use of data generated by implementation efforts	Data experts were involved in the project to manage all collected data. A data management plan was developed by the data manager outlining data protocols across the project and shared with the research team when relevant. A statistician will be involved and consulted on data collection and data use throughout the project. A Program Evaluation Committee will be consulted bi-annually for data collection, analysis, and reporting processes.	Data Management Plan Program Evaluation Committee Notes	DPRG	Pre-Implementation, Implementation & Sustainability	Fidelity; Acceptability; Feasibility; Implementation Cost
Use data warehousing techniques	Integrate clinical records across facilities and organizations to facilitate implementation across systems	A data manager will oversee data collection. A survey platform known as REDCap will used to collect all quantitative data across the project for all sites.	Data Management Plan	DPRG	Pre-Implementation	Fidelity; Acceptability; Feasibility; Implementation Cost
Use mass media	Use media to reach large numbers of people to spread the word about the clinical innovation	An SSBC program website was created to spread easily accessible information about the program and assist with recruitment. Social media accounts have been developed to advertise the program and engage with eligible audiences. Template documents have also been provided to sites to encourage their use during news interview opportunities, press releases, radio announcements, and newspaper articles.	SSBC Website Press Release Template Radio Template	DPRG	Pre-Implementation	Penetration
Intervene with patients/consumers to enhance uptake and adherence	Develop strategies with patients to encourage and problem solve around adherence	To enhance uptake of the program and increase knowledge of T2D risk, health assessment days will be hosted in the community. The program eligibility survey will be accessible on the SSBC website to enhance uptake and direct participants to the consent form if deemed eligible.	Educational and Recruitment Materials, SSBC Website	DPRG, RRCs and SLs	Pre-Implementation, Implementation & Sustainability	Penetration
Change accreditation or membership requirements	Strive to alter accreditation standards so that they require or encourage use of the clinical innovation. Work to alter membership organization requirements so that those who want to affiliate with the organization are encouraged or required to use the clinical innovation	Coaches are encouraged to maintain a minimum 6-month commitment to deliver the program to help avoid high turnover. Incentives for coaches will include raffle prizes and VCoP recognition as an "all-star" coach if a certain number of coaches is reached or level of client satisfaction is reported. Practicum students and volunteers may be offered the opportunity to become a SSBC coach and delivery the program as part of their hours. SSBC clients will be incentivized to join the program as it is free of cost and includes a YMCA membership for the duration of their sessions.	VCoP, REDCap	DPRG	Pre-Implementation	Sustainability; Penetration; Adoption
Facilitate relay of clinical data to providers	Provide as close to real-time data as possible about key measures of process/outcomes using integrated modes/channels of communication in a way that promotes use of the targeted innovation	Provide clinicians and referring physicians with outcome reports of their patients' progress through the program to promote referrals to SSBC.	REDCap	DPRG	Implementation & Sustainability	Penetration; Adoption

Table 2 (continued)

ERIC Strategy	ERIC Definition	Operationalization (how SSBC plans to use the strategy–may include the action and action target in description)	Resource Tools needed	Actor	Temporality	Implementation Outcome Targeted by IS (Proctor's Taxonomy)
Recruit, designate, and train leaders for the change effort	Recruit, designate, and train leaders for the change effort	RRC's were recruited, hired and trained to support the program and all implementation efforts.	RRC SOP RRC Orientation Presentation	DPRG & RRCs	Pre-Implementation	Fidelity; Sustainability

Step 4: Operationalizing Implementation Strategies

Each of the 54 ERIC strategies was operationalized to articulate how this strategy fit the context of SSBC. *Actions* of each strategy explained how the strategy would be executed and further defined the strategy. The SSBC *Tool* outlined the implementation resources needed to facilitate the use of each strategy. The *Actor* of the strategy identified who was responsible for executing the strategy, options included the research team, Regional Research Coordinators (RRCs) on the project and Site Leads (SL) (YMCA implementation staff). All 54 strategies were proposed to involve DPRG, 23 involve RRCs and 12 involve SLs. The *Stage* referred to when a strategy would be implemented and used. Forty-five strategies were identified for use during the pre-implementation phase, 28 during implementation and 21 during sustainability. The *Implementation Outcomes* were defined as the following: Acceptability, Adoption, Appropriateness, Feasibility, Fidelity, Implementation Cost, Penetration and Sustainability (Proctor et al., 2013). Implementation outcomes were chosen based on if it was targeted or affected by the associated strategies (see Table 2).

Step 5: Creating the Implementation Blueprint

The operationalized strategies were used to create a user-friendly blueprint for delivery sites that included accessible language and actionable strategies useful to site delivery. This two-page blueprint was shared with each site during an adaptation workshop meeting. This blueprint outlined its' purpose and goals, the roles and responsibilities of each member of the team including the committees, principle knowledge users (PKUs), DPRG RRCs, SLs and Coaches. The blueprint included implementation tools to be provided to help support the delivery of the SSBC at their site. Tools listed in the blueprint included the online coach training, recruitment material packages, a VCoP for coaches, program resources (checklists, workbooks and session guides), data collection tools (REDCap and Otter.ai), the SSBC website and relevant SOPs. See Supplementary Material 2 to view the implementation blueprint distributed to sites. After sharing the blueprint with 11 urban YMCA sites, positive feedback was received regarding the anticipated support some of the resources would provide, and no adaptations were required.

Step 6: Creating a Resource Toolkit to Support the Implementation

This toolkit included a collection of resources helpful to each site in program delivery but also included resources that were expected to add organization and value for the

research team. A total of 27 implementation tools were identified and created for this project (see Table 3). 15 were included in the site-specific toolkit and 17 were included in the research team-specific toolkit, with an overlap of six tools used in both (Recruitment Package, SSBC Website, Tracking Sheets, Coach Training SOP, Adaptation Workshop and HCP Presentation Package).

Step 7: Develop a Tracking System for Implementation Strategy Use Throughout the Project

A REDCap online form was created for tracking implementation strategies by the research team across the sites. In addition, a site tracking document and standard operating procedure for recording activities into the REDCap form was generated to ensure consistent completion of the form. The tracking system involves the use of activity logs to track implementation activities over the 24-month SSBC implementation across 44 sites. Specifically, activity log data, for each site, will be captured every three months. Every quarter, a member of DPRG will review meeting minutes and site reports and record the implementation activity within the log. Data captured will include: when and where the activity occurred (temporality and dose), the purpose of the activity (action), the individuals involved in the activity (actor), the target of the activity (action target), why that activity was chosen (justification), any barriers to the implementation activity, the anticipated outcome and actual outcome of the activity if known (implementation outcome), and any adaptations that had to be made to the activity. In addition to reviewing study documentation, key members of DPRG (e.g., the project manager and data manager) who regularly engage directly with delivery sites, will complete the activity log throughout the project to record implementation activities that may not be captured in formal meeting documents or reports (Bunger et al., 2017). It is anticipated, based on previous research, that it will take approximately 5 min per log entry, depending on the level of detail reported (Hyzak et al., 2023).

Discussion

The objective of this study was to develop an implementation blueprint and toolkit for use in the national scale-up of the SSBC diabetes prevention program (DPP) based on a systematic and transparent method of identifying and operationalizing suitable implementation strategies. This project drew on implementation of SSBC both in urban and rural locations of British Columbia and the national scale-up planning meetings to identify barriers and facilitators to SSBC implementation across diverse implementation settings, covering 8-years of research. In total 41 facilitators and 18 barriers to implementation were identified, which were linked to 54 strategies and the ultimate creation of an SSBC implementation blueprint and resource toolkit consisting of 26 resource tools were identified or created. The 54 ERIC implementation strategies were identified and operationalized to further articulate how this strategy fit the context of SSBC to create an implementation blueprint. This blueprint informed where resources and support tools were needed to be created for project partners. The proposed strategies and implementation tools aim to help guide and support the implementation and sustainability of the urban scale up SSBC. No specific guidelines exist outlining a required number of strategies to ensure implementation success, as such this work selected appropriate strategies by systematically linking them to identified barriers and facilitators for implementation (Powell et al., 2017). A strength of this study was the identification of both barriers and facilitators, past literature has focused solely on addressing barriers but not necessarily supporting facilitators to implementation (Lewis et al., 2018). Identifying both barriers and facilitators allowed for an encompassing approach to ensure select strategies were not missed.

The seven-step methodology to selecting implementation strategies, creating an implementation blueprint and prospectively outlining a tracking system for implementation strategy adaptations aims to increase transparency in the planning process of program scale up. Past research has reported challenges in the translational process of evidence-based practices, with only a third of health behaviour interventions progressing from efficacy focused behavioural trials to community-based scale-up efforts (McCrabb et al., 2023). The implementation plan and process showcased in this work can be applied to implementation efforts beyond SSBC. The identification of implementation strategies and the development of an implementation blueprint and resource toolkit outlines a detailed plan for behavioural intervention scale-up relevant to chronic disease prevention efforts focused on diet and exercise changes. This study has demonstrated a rigorous and systematic method to selecting where resources, time and efforts will be made throughout the scale-up process. Outlining a comprehensive implementation plan may help support evidence-based interventions maintain their effectiveness in community settings and target important implementation outcomes such as acceptability, feasibility and fidelity. This proactive approach may result in a smoother transition into organizational settings and improve community partnerships by increasing collaboration with all parties involved.

This work builds on exemplars in the literature that have developed blueprints for program implementation (Hyzak

Table 3 Implementation tools

Implementation Tool	Definition/Use	Toolkit
Client workbooks	SSBC program workbook provided to each client at their first session to guide them through the program (provides information and activity pages).	Site
REDCap	Software housing coach session checklists and client surveys used for data collection.	Site
Otter.ai	Audio recording and transcription application used during each client session to collect data for fidelity checks.	Site
Online SSBC Coach Training	Training course used to certify SSBC coaches: includes access to modules, practice mock session, learning resources, session guides, videos and FAQs (educational content: motivational interviewing, prediabetes, type 2 diabetes, diet and exercise).	Site
Final Steps Training	The final step to the SSBC coach training (after coach certification but prior to taking on a client) delivers information on how to collect data and use the data collection tools during SSBC session delivery. Also provides a live support opportunity where coaches can ask questions before delivering SSBC to clients.	Site
Virtual Community of Practice	Online access to a SSBC coach forum and a Microsoft teams chat for SLs to collaborate and problem solve.	Site
Site SOP	Standard operating procedures document outlining program logistics, core components, responsibilities, delivery logistics and communication protocols for the SL.	Site
Regional Research Coordinator (RRC) SOP & Training	Standard operating procedures document outlining program logistics, core components, responsibilities and communication protocols for the RRC. Additional training for RRCs was provided for conducting and coding coach training mock sessions.	Research Team
Recruitment Package	A collection of documents including posters, pamphlets, QR codes and email templates to assist in client recruitment efforts. Also includes resources for coach recruitment including a coach promotion 1-pager.	Site & Research Team
Supplies Package	A shipment of supplies including scales, stadiometers, swag, blood requisition forms, measuring tape, etc. is sent to each site prior to program launch.	Site
Adaptation and Implementation Workshop	A workshop held in the months prior to launch with each site to plan and support program delivery and tailor IS to align with identified contextual factors. Includes information about coaching, recruitment, scheduling, core components and introduces the digestible implementation blueprint and select implementation tools. An excel filed to organize and facilitate note taking will be used during each workshop.	Site & Research Team
SSBC website	A program website used to provide program information, eligibility screening and addresses for participating locations.	Site & Research Team
Tracking Sheets	Shared excel sheets to help track information and collect data about coach training status, fidelity checks, meeting notes, fidelity coding and recruitment activities.	Site & Research Team
Implementation Blueprint	An implementation plan presented to each site during the adaptation and implementation workshop outlining relevant IS, roles and responsibilities and goals.	Site
Coach Training SOP	A document outlining the process of coach training and how to operate the back end of the online training platform.	Site & Research Team
Governing Principles	This document is aimed to act as an overarching research project reference document holding key information about project timeline, core components, contact information, governance structure, roles and responsibilities.	Research Team
Formal IS Blueprint	Table 1 in this paper outlines each of the select strategies being used in the project with relevant information about how the IS is being used, who is it implemented by, when, and what implementation outcome it is targeting.	Research Team
Final Steps Training SOP	A document outlining the necessary steps in the Final Steps Training and relevant materials needed to deliver this session (coach consent, PowerPoint presentation, educational materials).	Research Team
Measurement Timepoints Table	A large table outlining the measures used over the duration of the project and the various timepoints when these measures will be collected.	Research Team
Fidelity Blueprint	A document outlining the plans for fidelity checks which include timing, an evaluation feedback template, and coding spreadsheets.	Research Team
HCP Presentation Package	A slide deck used to present to HCPs and MOA during scheduled "Lunch and Learns" in the community to assist with recruitment and marketing. This package also includes HCP information sheets and recruitment posters.	Site & Research Team
VCoP SOP	A document that outlines the process for facilitating and monitoring the virtual community of practice.	Research Team
IS Tracking Tool	A REDCap survey specifically designed to track adaptations of IS over the span of the project.	Research Team
Mentorship Program SOP	A document outlining the process of a mentorship program that connects new site leads with existing site leads to help support initial implementation efforts.	Research Team

Table 3 (continued)

Implementation Tool	Definition/Use	Toolkit
Data Management Manual	A document outlining the data collection, storage and management protocols across the scale up project.	Research Team
Service Agreement Template	A document template outlining a formal service agreement to establish a shared understanding of the partnership between the research team and delivery site, ensuring transparency regarding roles, timelines, responsibilities and resources.	Research Team
Letter of Support Template	A document template that outlines a site's planned commitment to deliver and expand the SSBC program.	Research Team

et al., 2023; Lewis et al., 2018; Valentine et al., 2022). As reported in previous work, developing a blueprint to scale-up an intervention across hospital units, the use of the CFIR-ERIC matching tool was used to identify strategies addressing barriers and facilitators to implementation (Hyzak et al., 2023). While the CFIR-ERIC matching tool was helpful in selecting strategies, it was developed in the context of healthcare settings. Community settings face unique challenges to implementation which may not be captured by the tool or the language utilized within the CFIR-ERIC matching tool (Waltz et al., 2019) As such, additional efforts were made to ensure a comprehensive and critical approach was taken to identify which strategies were relevant to the current community context. This involved the researchers reviewing each strategy in the context of the identified implementation factor and selecting strategies perceived to be relevant. Where the authors went beyond the matching tool, justification was provided. Furthermore, the research team classified primary and secondary strategies for the specified implementation factors. Strategies were classified in this manner to provide delivery sites with guidance for focusing implementation efforts if resources were limited. The primary strategy column details the main strategy used to address each barrier or facilitator, while the secondary strategy column highlights strategies that assist but not specifically selected for that purpose. Table 1 illustrates the overlap in implementation strategies and emphasizes the role of context. This information is valuable for implementation researchers with limited resources, as it suggests that secondary strategies, which may be less resource-intensive, can still address relevant barriers or facilitators, even if they are not the most potent option.

This study builds on other implementation blueprint development projects by clearly outlining how to develop a blueprint but also how to efficiently prospectively track the use of the identified strategies by research staff and delivery sites across 8 provinces in Canada over 24-months. The aim of this tracking system is to capture comprehensive information on strategy use in real time rather than relying on retrospective exploration. Identifying and tracking strategies allows for future researchers to replicate and build off of the work we have presented. McCrabb and colleagues recommend consistent reporting of adaptations to strategies during scale-up efforts to become standard practice as they are often not reported. This study outlines the strategies selected during the pre-implementation phase and outlines a tracking system to report the nature of strategy adaptations throughout this project. Identification of implementation strategy adaptations will add to the limited literature (McCrabb et al., 2023). Consistent reporting of strategy adaptations across behavioural interventions will allow for future research to compare and contrast strategy adaptations and progress the field of implementation science.

Blueprints have been used in the literature to help guide implementation and previous work has developed blueprints with extensive detail and information (Lewis et al., 2018). While this detail is important for researchers and implementation science, the amount of detail included in these blueprints may limit usage by community partners unfamiliar with implementation strategy jargon and implementation science. To ensure the blueprint was useable for our community partners a concise document was developed to share with YMCA sites and a toolkit with implementation resources was created to ensure that the relevant strategies identified by the research team (Table 2) were actionable for YMCA sites. The development of a useable blueprint designed for the implementation delivery system also aimed to increase likelihood of sustainable delivery efforts.

Sustainability of interventions is also a key consideration into the rationale of creating an implementation plan. A number of the strategies selected in this implementation plan target the implementation outcome of sustainability. Sustainability is important to understand whether funding investments lead to long-term outcomes and whether beneficial effects are sustained (Scheirer & Dearing, 2011). This work outlined strategies that may target sustainability from the perspective of pre-implementation. Future work can build off the initial strategies identified in Table 2 by assessing context specific barriers and facilitators further into the project timeline once the sustainability phase of the project is underway. Strategies that are planned for during the sustainability phase of scale-up can direct implementation efforts and resources to performing those strategies when most relevant. The goals of a project will change based on

the phase of implementation it is in, understanding when implementation strategies may be the most impactful will benefit the implementation process.

This work is not without its limitations, in terms of methodology, the data collected in Step 1 was different depending on the project as they were based in different geographical locations. This was deemed low risk and presented an opportunity to gather data beyond one urban location in British Columbia however differences in contextual factors did exist. For any strategies not used in the project, future reporting during tracking efforts will identify where appropriate blueprint changes need to be made for future sites, thereby building an iterative blueprint that can adapt and transform to the realities of contextual influences. The inclusion of views from knowledge parters who had received the program would have provided additional valuable insights reflecting their perceived barriers and facilitators to engaging with SSBC. While this project was designed to guide the identification and specification of implementation strategies from the perspective of those delivering the intervention, this is a limitation when considering the full picture of the factors that may have been relevant to the real-world implementation of SSBC. Future work aims to capture participant level engagement and preferences.

ERIC strategies have been criticized for their limited applicability for implementation of evidence-based interventions in community settings (Balis et al., 2022, 2024). Alternative implementation strategy taxonomy's have been created to account for these differences, their use was contemplated but rationale to maintain the use of ERIC strategies outweighed the additional options. Some of the benefits of using the ERIC strategies included their common use within the field of implementation science, the opportunity to expand on the original work done by Dineen and colleagues (Dineen et al., 2022) and the available use of the CFIR-ERIC matching tool. While there is no perfect taxonomy to cover the plethora of implementation settings, emphasis should be placed on clearly operationalizing the strategies for use within each specific context. The ERIC strategies used were largely designed for use in clinical settings making them difficult to apply to community settings which are more diverse in nature operating at multiple levels of society (Balis et al., 2024). ISAC strategies have since been published and could offer a more accurate taxonomy for community-based settings since they are specific to implementation of evidence-based programs and may have been more relevant to this project. However further consideration about the differences and overlap between ERIC and ISAC are needed and cautious consideration should be taken for future projects when selecting the strategy taxonomy used.

Next steps will follow the implementation project through the implementation and sustainability phases, tracking use and adaptations to strategies. The effectiveness of the methodology outlined in this study can be compared to other approaches and effectiveness of the implementation blueprint can be examined. Once this project is complete additional research can look to identify and explore which strategies may have been most effective, which strategies may be core to the SSBC and which strategies are most and least resource intensive. If this implementation plan and blueprint help facilitate the implementation of SSBC into community setting with effectiveness, acceptability and feasibility the odds of sustainability are more likely. These findings may be applied to other implementation efforts involving DPPs in community settings and highlight a rigorous method for implementation strategy selection. While results have the potential to be generalizable, contextual factors are highly important when considering which strategies are most fruitful for the population, location and intervention being implemented.

Conclusion

This paper describes the development and planned use of implementation strategies during the national scale-up of a diabetes prevention program across 44 locations in Canada. The implementation blueprint and tools developed for this project, and associated tracking system, will help support our community partners with effective delivery of the SSBC program and assist in transparent tracking and implementation data collection over the course of the project. By expanding SSBC in a sustainable manner, more individuals with prediabetes will be able to access this evidence-based diabetes prevention program, ultimately improving the health of Canadians by reducing their risk of type 2 diabetes.

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Data Availability The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors declare no competing interests.

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