

RESEARCH

Open Access



Readiness for scale up following effectiveness-implementation trial: results of scalability assessment of the Community Partnership Program for diabetes self-management for older adults with multiple chronic conditions

Melissa Northwood^{1*}, Tracey Chambers¹, Kathryn Fisher¹, Rebecca Ganann¹, Maureen Markle-Reid¹, Marie-Lee Yous¹, Ron Beleno¹, Gary Gaudet¹, Andrea Gruneir², Helen Leung³, Craig Lindsay¹, Kasia Luebke⁴, Gail Macartney⁵, Ethel Macatangay⁶, Janet MacIntyre⁵, Carolyn MacPhail⁷, William Montelpare⁵, Allan Morrison¹, Lisa Shaffer¹, Martha St. Pierre⁸, Frank Tang¹ and Catharine Whiteside⁹

Abstract

Background Implementation research should assess the feasibility of scale up to bridge the evidence-practice gap for integrated care programs in the prevention and management of chronic conditions. Scalability assessment is the first critical step of scale up to determine the potential suitability of a promising health program to be adopted into routine practice and the fit of the program within local contexts. The Community Partnership Program (CPP), an integrated care intervention for older adults with diabetes and multiple chronic conditions, was designed at the outset with scale up in mind, and evaluated in an implementation-effectiveness randomized controlled trial across three Canadian provinces. The final phase of this program of research was to assess scalability and determine the critical factors and next steps for the development of a scale up plan.

Methods Multiple methods were used to assess the scalability of the CPP including collection and analysis of publicly available documents, synthesis of qualitative and quantitative evidence from studies of the CPP, semi-structured interviews with key informants, feedback and recommendations arising from working group meetings and knowledge exchange workshops to discuss and rate the scalability of the program. Data collection and analysis was informed by the Intervention Scalability Assessment Tool (ISAT); developed to support practitioners and policy makers in conducting systematic assessments of the suitability of health interventions for population scale-up in high-income countries.

Results Overall, the CPP received high scalability ratings from participants. A phased, horizontal implementation and scale up process was recommended, facilitating local adaptations, on-going program evaluation,

*Correspondence:
Melissa Northwood
northwm@mcmaster.ca
Full list of author information is available at the end of the article



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

and accumulation of evidence. Challenges to scale up were identified, including the need for further evidence of program effectiveness in other diverse settings and populations, and designated funding and adequate health human resources.

Conclusions Participants agreed the CPP meets the needs of many older adults with diabetes and multiple chronic conditions; however, they suggested further tailoring of the program to support different ethnocultural groups and targeting the CPP to older adults with higher needs. The scalability assessment process was a practical method to generate concrete strategies to facilitate the uptake of the CPP into practice.

Trial registration Clinical Trials.gov Identifier NCT03664583. Registration date: September 10, 2018.

Keywords Diabetes, Older adults, Multiple chronic conditions, Scalability assessment, Integrated health care delivery, Workforce, Program evaluation

Background

Scale up is the process of integrating a health program or intervention into routine practice [1]. Implementation research should assess the feasibility of scale up to bridge the evidence-practice gap for integrated care programs in the prevention and management of chronic conditions [2, 3]. The historic focus in health services research in high-income countries has been on the development and testing of novel programs and interventions without an exploration of larger scale implementation [4]. This has created a knowledge gap regarding if and how promising interventions can become embedded into routine practice [4]. For knowledge mobilization efforts to be effective, researchers need to communicate program effectiveness, and include pragmatic steps on how to translate the program to a local context, and scale it for greater reach and impact [2, 4, 5]. Internationally, as countries contend with providing integrated care to an increasing population of older adults while advancing the quintuple aims (enhancing patient experience, improving population health, reducing costs, improving provider work life, and promoting health equity), efforts to understand how to assess the scalability of promising health interventions are a heightened priority [1, 4, 6–8].

The World Health Organization defines scalability as “the ability of a health intervention shown to be efficacious on a small scale and/or under controlled conditions to be expanded under real world to reach a greater proportion of the eligible population while retaining effectiveness” [2]. Scalability assessment is the first critical step of scale up to determine the potential suitability of a promising health program to be adopted into routine practice and the fit of the program within local contexts [1, 9]. Assessing the scalability of promising programs is important as many are scaled up with insufficient supporting evidence [9] and conversely, others with demonstrated effectiveness are not integrated into real-world health and social care systems [4]. The results of a scalability assessment can inform local or regional planning activities about the readiness for developing a scale-up

plan across various settings and populations, the need for further analysis, and actions and local adaptations to enhance intervention scalability [10].

The Intervention Scalability Assessment Tool (ISAT) was developed to support practitioners and policy makers in conducting systematic assessments of the suitability of health interventions for population scale-up in high-income countries [1, 5, 7]. In a recent systematic review of available tools to assess scalability, the ISAT was found to consider most of the important scalability components and many predictors of challenges [7]. The ISAT examines the following 10 domains: the problem that is being addressed; the intervention proposed to address the problem; intervention effectiveness; intervention costs and benefits; political/environmental contexts; fidelity and adaptation; reach and acceptability; delivery setting and workforce; implementation infrastructure; and sustainability. Historically in the design of novel interventions or programs, the focus was on determining the effectiveness or efficacy, rather than considering other factors, such as political or financial implications of scale up [11]. However, planning for scale up is an important part of study design as changes to policy and financial investments that are required in the post-trial period warrant early planning and consideration. Mechanisms to sustain and monitor the impact of programs and interventions at scale also need to be considered [2].

The Community Partnership Program (CPP), an integrated care intervention for older adults, was designed with scale up in mind [12–16]. Building on an initial pilot and randomized controlled trial (RCT), a larger program of research was launched, which included an implementation-effectiveness RCT evaluating the CPP across three Canadian provinces (Ontario, Prince Edward Island (PEI), and Quebec). This RCT was in progress when the COVID-19 pandemic lockdown occurred in Canada (March 2020). As a result, the program delivery moved from an in-person to a virtual format in Ontario and PEI but was unable to be completed in Quebec due to significant health human resource constraints [15]. The

final phase of this research program was to assess the program scalability and determine the critical factors and next steps for the development of a scale up plan in Ontario and PEI [15]. Approaches known to enhance the potential for scale up were embedded in the program of research, including: a) a participatory research process with key interested parties (including older adults and care partners); b) developing political commitment and champions of the program; and c) accumulating evidence in diverse settings and populations [2, 14, 15, 17]. This paper describes the scalability assessment process and findings for the CPP.

Methods

Intervention

The CPP is a six-month integrated care intervention for community-living older adults with diabetes and conditions and their care partners and is detailed in previous publications [12–15] and summarized using the Template for Intervention Description and Replication (refer to the Supplementary Material Appendix 1) [18]. The program was designed to address gaps in care identified by older adults with diabetes and multiple chronic conditions and their providers related to chronic disease self-management, care coordination, and system navigation. The program is based on best practice guidelines for diabetes and multimorbidity and was co-designed by older adults, primary and community care providers, and researchers. The CPP is collaboratively delivered by an interdisciplinary team that consists of primary care providers (registered nurse and registered dietitian) and a community program coordinator (kinesiologist or exercise specialist) from a local community-based organization. It integrates health and social care, and emphasizes interprofessional team-based care, self-management, and tailoring to address client goals and preferences [15].

Core program components include: a) up to three home or virtual visits by the nurse and/or dietitian; b) up to six monthly in-person or virtual group wellness sessions including health education, physical activity, and peer support; c) nurse-led care coordination and system navigation; d) care partner engagement and support; e) monthly team conferences to discuss and evaluate clients' care plans; and f) collaboration with primary care and specialists.

The initial pilot study and RCT demonstrated that the program was feasible and acceptable to older adults and providers. The CPP was found to be cost neutral and compared to usual care, improved diabetes self-management, mental health, quality of life, and collaborative teamwork [12, 14, 16]. In the most recent trial, no

between group differences were found in any of the primary health outcomes (Fisher K, Ploeg, Markle-Reid M, Valaitis R, Ganann R, et al: Effectiveness of the Aging, Community Health Research Unit's Community Partnership Program (ACHRU-CPP) for older adults with diabetes and multiple chronic conditions: results from a randomized controlled trials, submitted). The median health and social service costs were higher in the intervention group compared to the control with this difference reflecting the intervention cost. Interprofessional team ratings of partnership significantly improved over the trial.

Provinces included in the scalability assessment: Ontario and Prince Edward Island

Provincial governments in Canada are responsible for the delivery of publicly funded health services. In Ontario, diabetes education programs and centers offer education, self-management support, and counselling to adults ≥ 18 years of age. These programs are provided by teams of certified diabetes educators, including registered dietitians and registered nurses, and/or social workers and chiropodists responsible for facilitating individual and group sessions. These programs are situated in a variety of settings, such as acute care hospitals, family health teams, and community health centres [19]. Persons with diabetes in Ontario can also access chronic disease management support from their primary health care provider, who may be in solo practice, or part of family health team, family health group, or community health centre. The provincial health authority in PEI (Health PEI) operates a provincial diabetes program that provides education, support, and diabetes management advice. Patient Medical Homes were established in 2022 and provide collaborative, team-based primary care, including care by diabetes educators [20]. In both provinces, community services for older adults, such as exercise programs or chronic condition management programs, are operated by a mix of for-profit, municipal, and volunteer/charity organizations and are not formally part of usual diabetes care.

Study design

Multiple methods were used to assess the scalability of the CPP including collection and analysis of publicly available documents, synthesis of qualitative and quantitative evidence from all studies of the CPP, semi-structured interviews with key informants, feedback and recommendations arising from provincial working group meetings and two provincial knowledge exchange workshops to discuss and rate the scalability of the program [1, 10].

Framework: The intervention scalability assessment tool

The ISAT was used as a framework to guide data collection and analysis [1, 5]. The ISAT consists of two parts with 10 domains and a total of 19 readiness assessment questions, which are used to generate ratings of the scalability of the intervention by domain. The first five domains in Part A of the ISAT are to assess the intervention and the remaining five domains in Part B consider the implementation of the intervention [10]. A brief description of the domains is provided in Table 1.

Data collection and analysis

Data from four main sources were collected and analyzed to answer the ISAT readiness assessment questions: 1) relevant practice, policy, and research documents, 2) meeting documentation from provincial scalability working groups, 3) key informant interviews, and 4) feedback and recommendations from provincial knowledge exchange workshops. Patient and public research partners received honorariums in recognition of their time participating in the working groups and knowledge exchange workshops.

Relevant practice, policy, and research documents

The documents used to inform the scalability assessment are summarized in Table 2. Documents and sources were collected and reviewed through an on-line environmental scan [21] of: a) national, provincial, and regional health policy documents regarding older adults with diabetes and multiple chronic conditions and their care partners, b) current community-based diabetes programs,

c) published and grey literature on the prevalence and impact of diabetes and multiple chronic conditions in community-living older adults and effective community-based programs for this population, d) qualitative and quantitative evidence from the studies on the CPP [12, 14, 16] and the most recent implementation-effectiveness trial [15, 22]. Members of the research team conducted directed content analysis to summarize key findings across all data sources by domains of the ISAT [23]. From this analysis, a preliminary scalability assessment was generated in preparation for the working group meetings.

Provincial scalability assessment working groups

Provincial working groups were formed to provide guidance to the research team throughout the scalability assessment process. Members of the governance structure of the CPP program of research were invited to participate in the scalability assessment. The Ontario working group had nine members and the PEI working group had six members.

Two, virtual meetings of the working groups were held in each province. At these meetings, the research team shared the results of the preliminary scalability assessment by ISAT domains, and working group members provided further information regarding scalability and relevant literature and policy documents. Working group members provided feedback on their respective provincial working document, and this information (documented in meeting minutes) was incorporated in the scalability assessment documents. Working group members also identified potential key informants.

Table 1 Intervention scalability assessment tool

Domain	Brief Description
Part A: Setting the Scene	
A1. The problem	Considers the problem that is being addressed. This domain aims to describe the problem, who it affects, what it affects and how it is currently being addressed (if at all)
A2. The intervention	Describes the proposed service to address the problem
A3. Strategic/political context	Considers the current strategic/political/ environmental contextual factors that are potentially important influences on the service to be scaled up
A4. Evidence of effectiveness	Considers the level of evidence available to support the scale-up of the proposed service, such as scientific literature and/or other known evaluations of the intervention
A5. Intervention costs and benefits	Considers the known costs of the service delivery as well as any quantifiable benefits
Part B: Intervention Implementation Planning	
B1. Fidelity and adaptation	Considers whether there are any proposed changes to the service required for scale-up
B2. Reach and acceptability	Considers the reach and acceptability of the intervention for the target population
B3. Delivery setting and workforce	Considers the setting within which the intervention is delivered as well as the delivery workforce
B4. Implementation Infrastructure	Considers the potential implementation infrastructure required for scale-up
B5. Sustainability	Considers the potential longer-term outcomes of the scale-up and how, once scaled up, the intervention could become sustainable over the medium to longer term

Note. Adapted from "Intervention Scalability Assessment Tool" by A. Milat et al., [10], https://preventioncentre.org.au/wp-content/uploads/2019/11/The-ISAT-Oct-2019_FINAL.pdf

Table 2 Documents used to inform scalability assessments

Document Types	Sources
Community-based diabetes programs and services	<p>Ontario Self-Management Programs: https://www.selfmanagementontario.ca/en/regionalsite</p> <p>Ontario Online Chronic Self-Management Program: https://takecontroltakecharge.ca/chronic-disease/</p> <p>Government of Ontario Diabetes Education Program: www.ontario.ca</p> <p>Ontario Health811 Find a Service: https://health811.ontario.ca/static/guest/find-a-service^a</p>
National, provincial, and regional health policy	<p>Chief Public Health Office PEI Diabetes Trends Report 2018: https://www.princeedwardisland.ca/sites/default/files/publications/diabetesreport_2018.pdf</p> <p>Government of Prince Edward Island Primary Care Road Map: Modernizing Primary Care on Prince Edward Island, 2021: https://www.princeedwardisland.ca/sites/default/files/publications/primary_care_road_map_2021.pdf</p> <p>Government of Prince Edward Island Promoting Wellness, Preserving Health: A Provincial Action Plan for Seniors, Near Seniors, and Caregivers Living on Prince Edward Island: https://www.princeedwardisland.ca/sites/default/files/publications/dhw_promoting_wellness_preserving_health_action_plan.pdf</p> <p>Health PEI Strategic Plan 2021–24: https://www.princeedwardisland.ca/sites/default/files/publications/health_pei_strategic_plan_2021-24.pdf</p> <p>Ontario Health Annual Business Plan 2022/23: https://www.ontariohealth.ca/sites/ontariohealth/files/2022-05/OHBusinessPlan22_23.pdf</p> <p>Ontario Health Chronic Disease Prevention Strategy 2020–2023: www.ccohealth.ca/en/what-we-do/general-health/chronic-disease-prevention/strategy2020</p> <p>Ontario Ministry for Seniors and Accessibility: https://www.ontario.ca/page/ministry-seniors-accessibility</p> <p>Ministry of Health Ontario Health Teams, The Path Forward: https://www.ontario.ca/files/2024-01/moh-oht-path-forward-en-2024-01-22.pdf</p> <p>Ministry of Health Ontario Assistive Devices Program: https://www.ontario.ca/page/assistive-devices-program</p> <p>Public Health Agency of Canada Framework for Diabetes in Canada: https://www.canada.ca/en/public-health/services/publications/diseases-conditions/framework-diabetes-canada.html</p>
Published and grey literature on the prevalence and impact of diabetes and multiple chronic conditions in community-living older adults and effective community-based programs for this population	<p>Diabetes Canada. (2022). <i>Diabetes in Canada: 2022 Backgrounder</i>. https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Backgrounder/2022_Backgrounder_Canada_English_1.pdf [24]</p> <p>Diabetes Canada. (2021). <i>Diabetes in Prince Edward Island: Backgrounder</i>. https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Backgrounder/2021_Backgrounder_Prince-Edward-Island_FINAL.pdf [25]</p> <p>Fisher, K., et al. (2016). Comorbidity and its relationship with health service use and cost in community-living older adults with diabetes: a population-based study in Ontario, Canada. <i>Diabetes Research and Clinical Practice</i>, 122, 113–123. https://doi.org/10.1016/j.diabres.2016.10.009 [26]</p> <p>Miksch, A. et al. (2009). Additional impact of concomitant hypertension and osteoarthritis on quality of life among patients with type 2 diabetes in primary care in Germany: A cross-sectional survey. <i>Health Qual Life Outcomes</i>, 27(7), 19. https://doi.org/10.1186/1477-7525-7-19 [40]</p> <p>Statistics Canada. (2022). Diabetes, by age group. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310009607 [41]</p> <p>World Health Organization. (2016). <i>Global Report on Diabetes: World Health Organization</i>. https://www.who.int/publications/i/item/9789241565257 [42]</p>
Evidence from foundational studies and most recent trial of the Community Partnership Program	<p>Markle-Reid, M., et al. (2016). The Aging, Community and Health Research Unit-Community Partnership Program for older adults with type 2 diabetes and multiple chronic conditions: A feasibility study. <i>Pilot and Feasibility Studies</i>, 2, 24. https://doi.org/10.1186/s40814-016-0063-1 [11]</p> <p>Markle-Reid, M. et al. (2018). Community program improves quality of life and self-management in older adults with diabetes mellitus and comorbidity. <i>Journal of the American Geriatrics Society</i>, 66(2), 263–273. https://doi.org/10.1111/jgs.15173 [13]</p> <p>Miklavcic, J. J. et al. (2020). Effectiveness of a community program for older adults with type 2 diabetes and multimorbidity: A pragmatic randomized controlled trial. <i>BMC Geriatrics</i>, 20(1), 174. https://doi.org/10.1186/s12877-020-01557-0 [15]</p> <p>Ploeg, J., et al. (2022). The Aging, Community and Health Research Unit Community Partnership Program (ACHRU-CPP) for older adults with diabetes and multiple chronic conditions: study protocol for a randomized controlled trial. <i>BMC Geriatrics</i>, 22:99. https://doi.org/10.1186/s12877-021-02651-7 [14]</p>

Note. ^aAt the time of study Health Connect Ontario

Scalability key informant interviews

Individual semi-structured interviews were conducted with a purposeful sample of key interested parties who were identified as having portfolios that included responsibility for supporting older adults with diabetes and multiple chronic conditions. Interviews were conducted concurrently with the working group meetings and prior to the knowledge exchange workshops. Participants included policy- and decision-makers at the local, provincial, and national levels, and senior practitioners and managers. An email script was used to invite potential key informants to participate in a one-on-one interview with a member of the research team by phone or videoconference, depending on the preference of the potential informant. A semi-structured interview guide was developed based on questions from the ISAT and included a question about experiences with scaling-up other programs (refer to Table 3). Interviews were audio-recorded and transcribed verbatim by an experienced transcriptionist. Transcripts were analyzed using directed content analysis by the domains of the ISAT [10, 23]. The findings from these interviews were incorporated into the preliminary provincial scalability assessment documents.

Provincial knowledge exchange workshops

A virtual provincial knowledge exchange workshop was held over 2 half-days in each of the two provinces. The workshops aimed to: a) review and gather feedback on the preliminary findings of the scalability assessment; b) identify intervention components to be strengthened, necessary adaptations, and barriers to be addressed to enhance program scalability; and

c) rate the adapted program scalability and readiness for scale-up. The researchers provided brief overviews of the preliminary findings for each ISAT domain and workshop participants were encouraged to share their questions and reflections on the findings. Lastly, participants were invited to rate the readiness for scale-up for each ISAT domain or to abstain from rating. Research team members did not participate in rating.

A professional facilitator, who was not part of the research team, led the workshops and used group decision support software to collect participants' anonymous responses to each ISAT readiness question in real-time. Questions related to scalability readiness were rated on a four-point scale [not at all (0), to a very small extent (1), somewhat (2), to a large extent (3)] for each ISAT domain. Following each rating, participants were encouraged to discuss the rationale for their ratings or to enter comments anonymously into the software program. Scores for each question in a domain were averaged across participants and across questions within the domain to create a final score for the ISAT domain, as per the ISAT guidance [10]. A radar plot was used to create a visual representation of the average score for each domain. The radar plot helped to highlight differences in scalability across the 10 domains and focus subsequent discussions on strategies to address domains where scalability readiness was rated lower.

Following the workshop, research team members reviewed the individual ratings, comments, and meeting minutes, synthesized the findings, and summarized the results in a scalability assessment report for each province [27, 28].

Table 3 Semi-structured Interview Guide for Key Informants

1. Can you briefly describe the current delivery settings for the programs like the Community Partnership Program?
2. What is the situation in your province regarding self-management support for older adults with multiple chronic conditions and their caregivers?
3. What level of scale-up could you see for this program? (e.g., more local sites, regional roll-out, provincial roll-out, national roll-out)
4. What do you feel would be the costs of implementing the program (e.g., staff costs, cost of training, infrastructure, equipment)?
5. What do you feel would be the benefits of implementing the program?
6. Do you think that any aspects of the program would need to be changed before scale-up?
7. How do you think that the fidelity to the program could be monitored if scaled up? (fidelity being the extent to which parts of the program is delivered as originally planned)
8. What measures do you have in place presently that could be used to monitor the program over time (e.g., on-going quality assurance)?
9. How do you monitor the on-going quality of existing programs and services?
10. Who would you see as the target population for this program?
11. Who would you see as the delivery workforce and referrers for this program and would they remain the same workforce/referrers at scale-up?
12. In your experience, what type of infrastructure (e.g., clinic facilities, IT equipment) is needed to implement this program?
13. Once scaled up, how sustainable do you think the service would be in the medium to long term (5–10 years)?
14. Do you have any additional comments or feedback on the scalability or scale-up for the Community Partnership Program that you would like to share?

Results

Participants

The Ontario working group had nine members and the PEI working group had six members. Ten key informants participated in interviews, five in each province, representing different levels of leadership in one of the two provincial health systems (n=9) and a pan-Canadian not-for-profit organization (n=1). Twelve participants attended the workshop in Ontario (representing local, provincial and national diabetes-related organizations and patient and public research partners) and eight attended from PEI (representing the PEI Department of Health and Wellness and Health PEI, and patient and public research partners).

Scalability assessment

Overall, the scalability of the CPP was rated highly in both provinces. Each readiness assessment question scored between 2.0 and 3.0 on average, on the 0-to-3-point scale. Figures 1 and 2 summarize the scalability assessments through ISAT radar plots for Ontario and PEI. Mean scores for each domain by readiness question and province are summarized in Table 4.

Domain A1: The problem

Domain A1 asked participants to consider if diabetes among community-living older adults with multimorbidity is of sufficient priority to warrant scale-up of the CPP to address the problem. In both provinces this domain

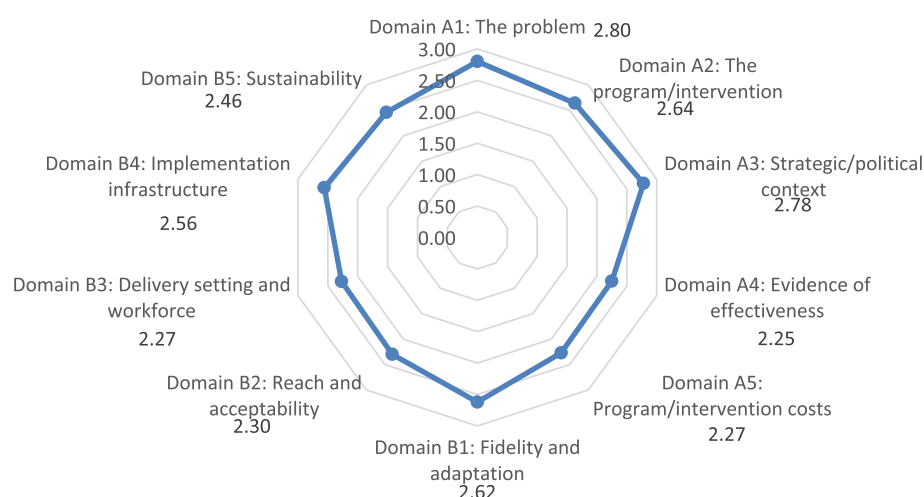


Fig. 1 ISAT Radar Plot of the COMMUNITY PARTNERSHIP PROGRAM Scalability Assessment Mean Scores for Ontario

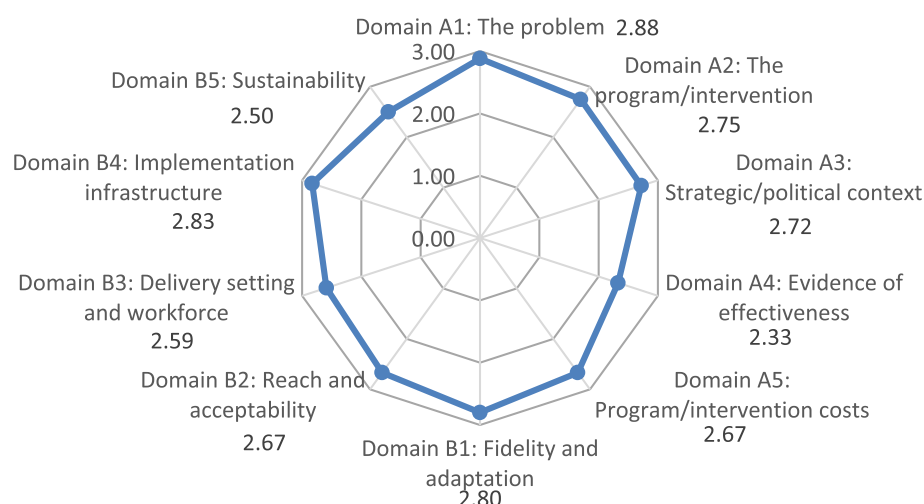


Fig. 2 ISAT Radar Plot of the COMMUNITY PARTNERSHIP PROGRAM Scalability Assessment Mean Scores for PEI

Table 4 Intervention Scalability Assessment Tool (ISAT) Mean Ratings by Questions and Province (N = 20)

ISAT DOMAIN	ON (n = 12)	PEI (n = 8)
Readiness Assessment Question(s)	Mean (SD)	Mean (SD)
DOMAIN A1: THE PROBLEM		
Q1. In your opinion, is diabetes among community-living older adults with multiple chronic conditions of sufficient priority to warrant scale up of the ACHRU-CPP to address this problem?	2.80 (0.13)	2.88 (0.11)
DOMAIN A2: THE INTERVENTION		
Q2. Do you think the outcomes intended by the ACHRU-CPP address the needs of the target group (and/or) problem (diabetes and multiple chronic conditions)?	2.64 (0.16)	2.75 (0.14)
DOMAIN A3: STRATEGIC AND POLITICAL CONTEXT		
Q3. To what extent is addressing the problem of diabetes and multiple chronic conditions in community-living older adults consistent with policy /strategic directions or priorities?	2.91 (0.10)	2.86 (0.12)
Q4. Do you think scaling up the ACHRU-CPP would be strategically useful to funders/funding agency?	2.64 (0.16)	2.57 (0.16)
DOMAIN A4: EVIDENCE OF EFFECTIVENESS		
Q5. Based on the evidence available, do you think the ACHRU-CPP will be effective in addressing the problem in the target population?	2.25 (0.20)	2.33 (0.16)
DOMAIN A5: INTERVENTION COSTS AND BENEFITS		
Q6 Based on the evidence available, do you think that the benefits of the ACHRU-CPP could outweigh the costs?	2.27 (0.15)	2.67 (0.16)
DOMAIN B1: FIDELITY AND ADAPTATION		
Q7. What changes/adaptations to the core components, if any, are recommended to maximize the scalability of the ACHRU-CPP?	NR	NR
Q8. If the core components of the ACHRU-CPP are changed/adapted as recommended, are the impact(s) likely to be favourable?	2.50 (0.17)	2.80 (0.13)
Q9. To what extent can the changed/adapted ACHRU-CPP be monitored and/or maintained if it is implemented at scale?	2.73 (0.15)	2.80 (0.13)
DOMAIN B2: REACH AND ACCEPTABILITY		
Q10. Do you think the ACHRU-CPP in its current form has the potential to reach the intended target population at scale?	2.17 (0.18)	2.50 (0.17)
Q11. Do you think the ACHRU-CPP will likely be acceptable to the target population at scale-up?	2.42 (0.16)	2.83 (0.12)
DOMAIN B3: DELIVERY SETTING AND WORKFORCE		
Q12. Is the delivery setting(s) selected to deliver the ACHRU-CPP at scale consistent with that used in previous studies?	2.08 (0.21)	2.67 (0.25)
Q13. Is the workforce intended to deliver the program at scale consistent with that used in previous studies?	2.33 (0.16)	2.50 (0.25)
Q14. Is the ACHRU-CPP likely to be acceptable to the delivery workforce involved in its delivery at scale?	2.25 (0.14)	2.50 (0.17)
Q15. As the ACHRU-CPP requires integration into existing organizational or community structures, do you think this is likely to be feasible?	2.42 (0.16)	2.67 (0.16)
DOMAIN B4: IMPLEMENTATION INFRASTRUCTURE		
Q16. Do you think the implementation infrastructure requirements for scale-up will be feasible to acquire?	2.56 (0.17)	2.83 (0.12)
DOMAIN B5: SUSTAINABILITY		
Q17. In your opinion, is the level of integration of the ACHRU-CPP into delivery settings required for implementation at scale sustainable?	2.75 (0.14)	2.50 (0.17)
Q18. In your opinion, is the level of resourcing required to implement the ACHRU- CPP at scale sustainable?	2.38 (0.16)	2.50 (0.17)
Q19. In your opinion, is the delivery workforce required for implementation at scale sustainable?	2.25 (0.22)	2.50 (0.17)

Note. ACHRU CPP Aging, Community and Health Unit Community Partnership Program, NR not rated, ON Ontario, PEI Prince Edward Island, SD standard deviation

received the highest mean score in Part A of the ISAT tool. Participants suggested that the intervention would benefit from a presentation strategy, such as creating key messages for funders to convey the importance of supporting older adults with diabetes and multimorbidity by scaling-up the CPP.

Domain A2: The intervention

Domain A2 asked participants to consider whether the intended outcomes of the intervention addressed the needs of the target population and/or the problem. In

both provinces, participants appreciated the holistic, patient-centred focus of the intervention and its support for management of diabetes and other chronic conditions. However, program scale up would require analyzing the delivery of diabetes care across all populations and identifying sub-populations of older adults who would most require and benefit from an enhanced care model. Participants noted this would be supported by using a data informed approach to identify and recruit this priority population. In PEI, the identification of potential participants for the program could be

automated and flagged through their newly introduced provincial electronic health record.

Domain A3: Strategic/political context

Domain A3 asked participants to consider to what extent addressing the problem of diabetes and multimorbidity in community-living older adults is consistent with current policy, strategic directions, or priorities, and if scaling up the CPP would be strategically useful to program funders. Participants and key informants noted that addressing the problem of diabetes and multiple chronic conditions among older adults is well aligned with current provincial priorities in both provinces of using integrated care models to deliver care to a geographically defined catchment, such as integrated care pathway development in Ontario and development of Patient Medical Homes in PEI. In addition, they noted a need to understand the effectiveness of existing diabetes programs and determine if scaling up of the CPP would require additional funding or the reorganization of current care delivery.

Domain A4: Evidence of effectiveness

Domain A4 asked participants to consider if the CPP would be effective at addressing the problem in the target population based on the available evidence. The score for this domain was rated the lowest score among all 10 of the ISAT domains. Participants perceived that the lack of statistically significant differences in any outcomes in the most recent RCT (compared to usual care) were largely attributable to implementation challenges encountered due to the COVID-19 pandemic. They also felt that the program may not have targeted a population where quantitative effectiveness could be demonstrated (i.e., older adults in most need). Participants suggested that a longer follow-up period may also have been required to capture changes that occurred due to the intervention, since outcomes were only measured immediately post-intervention. As well, participants suggested that new outcome measures (e.g., global self-management measure) may be needed to detect potential impacts. Participants agreed that a balanced view of the trial's positive qualitative findings (e.g., perceived impacts by participants and interventionists, acceptability of the intervention) with the quantitative results needed to be taken when considering scalability (Fisher K, Chan Carusone S, Ganann R, Northwood M, Sherifali D: Transforming healthcare by prioritizing qualitative and quantitative clinical trial evidence: evaluating the Aging, Community and Health Research Unit's Community Partnership Program, submitted).

Domain A5: Intervention costs and benefits

Domain A5 asked participants to consider the costs of delivering the CPP and its quantifiable benefits, and to

rate whether these benefits could outweigh the implementation costs. The cost analysis of the CPP considered the use of health and social services from a societal perspective, including costs incurred by persons with diabetes. Since the trial was conducted during the COVID-19 pandemic, the use of other health and social services were reduced, and by extension, the costs of use were also reduced. The most recent trial yielded higher total health and social service costs for participants in the intervention group versus the control; entirely attributable to the cost of the intervention with little/no group difference in the change over time in the costs of other services. Participants noted important perceived benefits of the CPP that were not evaluated quantitatively, such as the value of home visits in better understanding issues affecting self-management of diabetes by older adults (e.g., living situation, food insecurity), strengthened intersectoral collaboration between providers, and opportunities for peer support in the group wellness sessions. Key informants in both provinces noted that the CPP has the potential to demonstrate increased efficiencies and effectiveness of existing diabetes care as a standardized, evidence-based program and inform other initiatives (programs for diabetes and other chronic conditions) if a more comprehensive approach was used (e.g., full cost-benefit analysis). Some participants felt further evaluation was needed to gain more information on the program's impact and cost.

Domain B1: Fidelity and adaptation

Domain B1 asked participants to consider changes or adaptations to the core components of the intervention that would be required to maximize scalability and favourable impacts. Participants were also asked to consider how the intervention could be monitored and maintained at scale. Some participants suggested scaling up in-person delivery of the intervention, while others supported the use of a hybrid model (both in-person and virtual delivery options) depending on the needs and preferences of the older adult. Virtual program delivery was seen of benefit to some participants, for example when transportation was not available or during inclement weather. Electronic health record platforms were identified as a strategy for facilitating continuous monitoring of program outcomes and the collect feedback from older adults and their care partners.

Domain B2: Reach and acceptability

Domain B2 asked participants to consider the reach and acceptability of the CPP to the intended population. Participants felt overall that the program would be acceptable to older adults with diabetes and multiple chronic conditions, however offered specific local

recommendations to improve program reach and acceptability. For example, in Ontario, suggested adaptations included operating the group sessions in a faith-based setting by bilingual and bicultural providers with strong understanding of the local community.

Domain B3: Delivery setting and workforce

In Domain B3, participants were asked to consider the setting in which the CPP would be delivered, the associated workforce to implement the program at scale, and if delivery of the program in these settings with the current workforce would be acceptable and feasible. Participants indicated that it may be feasible and acceptable to integrate the CPP into existing diabetes education programs. They suggested that integrating the program would require buy-in and support from community leaders and partnering with organizational champions. To begin scaling up the program, participants suggested starting with organizations that would be most willing to engage, leveraging existing infrastructure where the program represents a good fit, and proceeding in a phased approach (i.e., one setting at a time).

Domain B4: Implementation infrastructure

Domain B4 asked participants to consider the feasibility of acquiring the implementation infrastructure to scale up the CPP. Implementation infrastructure includes the organizational and health human resources required to implement the program at scale (e.g., training, education, feedback and monitoring systems, clinic and community facilities).

Participants identified the main barrier to scale-up would be securing adequate health human resources to deliver the program, given existing shortages. Key informants also noted the importance of the development of cross-sectoral partnerships. The CPP differs from usual care in most settings with its use of home visits and group wellness sessions, both requiring additional staff to be delivered. Participants agreed with the proposed infrastructure requirements identified through the scalability assessment and thought that they would be feasible to acquire. This would include standardized training curriculum and ongoing education, local community advisory board to support implementation and adaptation of the program, leadership support and buy-in, clinical/organizational champions, a program coordinator, information technology systems for documentation in health records and ongoing program monitoring. However, sustainable funding for delivery of the CPP would need to be secured in both provinces.

Domain B5: Sustainability

Domain B5 asked participants to consider the potential outcomes of scaling up the CPP and program

sustainability in the medium- and long-term, if it were scaled up. Participants identified that program sustainability would depend on support from public funders and agencies, as well as ongoing collaboration with primary care, diabetes care programs, community partners, older adult and caregiver research partners, and champions. In both provinces, the identification of a backbone implementing organization was regarded as an important prerequisite. The backbone organization would also need to be responsible for training, technical guidance, monitoring program fidelity and outcome measurement, and advancing health equity.

Implementation planning considerations

The critical factors and next steps to scaling up the program in each province were identified during the provincial knowledge exchange workshops. Key informants were also asked to share lessons learned in scaling up other initiatives or programs. In both provinces, participants suggested that a targeted communication plan would need to be developed to communicate the need for and benefits of the CPP to provincial ministries of health, providers, and older adults.

Next, a backbone organization would need to be identified in each province. Key informants in Ontario thought that Ontario Health Teams (integrated model of care where providers in hospitals, primary care, and home and community care work as one coordinated team) would be in position to be the backbone organizations given the alignment of the program with their chronic disease strategy. In PEI, key informants thought Patient Medical Homes would be in a position to serve as the backbone organization, with the Department of Health and Wellness providing program funding.

The development of a scale up plan could then occur with interested primary and community care organizations to consider how current workflows could be reimaged to integrate and support the program. The support of senior leadership in these organizations was viewed as critical by key informants. A phased, horizontal approach to implementation and scale up was regarded as the optimal approach, where the program is implemented in different settings, allowing for continued accumulation of evidence and ongoing adaptations and development guided by the evidence [2]. A horizontal approach was preferred to vertical scale up, which would be the implementation of the program across the province [2]. Participants noted that in a phased approach, adaptations could be made to fit the needs and context of the local community that would inform larger scale up efforts. Ideally, key outcome measures could be embedded in electronic health records to support continuous program monitoring and evaluation. Future funding

opportunities to support implementation evaluation and iterative program development would be beneficial.

Discussion

We have provided an exemplar for other researchers and health and social care providers and leaders on how to collaboratively assess the scalability of a program. Both the findings and our approach make contributions to evidence related to integrated care programs for other chronic conditions in older adults. This study assessed the scalability of the CPP, an integrated care program for older adults with diabetes and multiple chronic conditions and their care partners, and determined the most critical factors and next steps to scaling up the intervention in two provinces in Canada, Ontario and PEI. Overall, the CPP received high scalability ratings from participants. A phased, horizontal implementation and scale up process was recommended, facilitating local adaptations, ongoing program evaluation, and accumulation of evidence. However, challenges to scale up were identified, including the need for further evidence of program effectiveness in other diverse settings and populations, and designated funding and adequate health human resources.

All participants strongly agreed that diabetes among older adults with multiple chronic conditions is a significant problem and warrants the scale up of the CPP. Participants felt that the program was well aligned with the strategic directions of both provinces, especially given the focus on improving care pathways for persons with diabetes and multiple chronic conditions [29, 30]. However, dedicated funding for the program may be challenging to acquire within competing system demands.

Providing a realistic estimate of benefits and costs to help inform participants' assessment of the net program benefit was challenging. Many of the program's benefits are difficult to quantify or monetize, such as the impact of an assessment done during a home visit to tailor care planning. The directors who would be responsible for budgeting for the program were interested in how much the program would cost to implement within their organization and what organizational cost savings would be realized. Translating the costs of intervention implementation within the context of a trial to the cost of implementation as part of usual health and social care is an important scalability consideration and one that requires consideration of health care policy and the infrastructure and assets of all organizations in the interprofessional team delivering the intervention [31]. The lack of collaborative funding models is a recognized challenge in the implementation of integrated care programs in many health and social care systems around the world [32]. Funding mechanisms are not integrated at the population level (i.e., collective responsibility to care for

a well-defined population) but rather at the level of the organizations [32].

Participants agreed that the key components of the CPP meet the needs of many older adults with diabetes and multiple chronic conditions; however, they suggested that the program needs to be further tailored to support different ethnocultural groups and may be more effective and efficient if targeted to older adults with higher need. The characteristics of different older adult populations that could benefit the most from the program were suggested to improve the program's effectiveness and outcomes, however further research is needed to identify these groups. Several adaptations were also suggested to improve program acceptability and effectiveness to older adults and their care partners. However, this creates a tension between ensuring the fidelity of the tested program at scale and the need for local adaptation. Adaptation to programs is a valuable consideration in scalability and for modifications to be fidelity-consistent the core elements of the program must be preserved that are required for it to be effective [33]. At the same time, implementing a program without consideration of fit is not recommended, as it would negatively impact effectiveness and sustainability [33, 34].

The identification of the production of health inequities is not explicitly noted in the ISAT. A systematic review of tools for assessing the scalability of innovations in health found health inequities to be the least considered potential pitfall to planning scale up in the 21 tools examined [7]. Likewise, an umbrella review of evidence on scaling in health and social care located only one review that examined ethical, legal and societal issues, such as equity of care and community needs, as part of the scale up process [31]. Failing to adequately consider equity issues and local community needs when assessing scalability could perpetuate or exacerbate health inequities if programs are scaled up without knowledge of their impact across diverse communities [7, 33]. In our scalability assessment, health inequities were the focus of many discussions initiated by participants. We hypothesize this was due to the emphasis on health equity and the social determinants of health in the design of the CPP, but also because of the inclusion of patient and public research partners in planning and implementing the scalability assessment process. The ISAT would benefit from prompts across the readiness assessment questions regarding production of health inequities and features of the target population (e.g., racialized groups) that require consideration.

Given the recommendations to adapt the program to local contexts, the importance of strategies to monitor the impact of the program at scale and implementation fidelity were raised by participants in both provinces. However, the information technology infrastructure required for continuous quality monitoring does not

currently exist in either province, such as electronic health records that span social and health care sectors and contain patient-reported outcome measures [35]. An absence of secure data infrastructure has been noted in other research of integrated care programs and care outcome data is more often available from primary and acute care sectors and not from the social care sector [36, 37]. Furthermore, few models of continuous quality improvement efforts using high-quality patient data exist, with the exception of long-term care [38], making it very challenging to continuously evaluate promising programs in the real-world context [35]. Monitoring the longer-term impact of the program will be important as the program is delivered in new contexts with different populations. It will take time for the program to become fully integrated into practice and future needs of the population and/or community may require additional program adaptations [34, 39]. Researchers conducting a qualitative case study of sustainability of scaled up population health interventions suggested the inclusion of sustainability in funding proposals or innovative funding opportunities to renew funding if commitment to scale up is secured [39].

Planning for the scalability assessment as a final phase of the research program and overall evaluation of the CPP was beneficial. Many of the participants had excellent working knowledge of the program and experience in its delivery allowing them to engage deeply in the assessment. In addition, the diverse backgrounds of the participants provided critically important perspectives, which facilitated assessing scalability and generating implementation considerations reflective of real-world contexts. The collaborative process also resulted in strengthening relationships between researchers and participants that can be leveraged for on-going implementation and evaluation of this program and other complex, integrated care interventions for older adults. The long-term engagement and collaboration required to move research into practice is aligned with the development of a learning health system, where care delivery and research are well connected [24, 35]. Given that the policy and practice environment is ever-changing, this final phase of the scalability assessment facilitated an assessment of how the CPP aligns with the current policy and practice context. Significant movements towards integrated care in both provinces, and enhanced awareness of social health determinants and equity from critical lessons learned in the pandemic, means that the program has even better alignment than when it was initially co-designed.

The ISAT was useful in facilitating data generation. However, participants and key informants provided highly relevant information that was not specifically elicited by the ISAT readiness questions, but very important in assessing the scalability of the CPP. As noted earlier, the

ISAT would benefit from prompts regarding production of health inequities and features of the target population (e.g., equity-denied groups) related to the intervention (Domain A2). The implementation infrastructure domain (B4) would be strengthened with prompts regarding availability of leadership support, provider champions, and community leaders, as participants identified these factors as facilitating scalability of the program. Inclusion of these factors in a scalability assessment is also consistent with other commonly used implementation science frameworks [25].

Strengths and limitations

The ISAT provided a useful structured approach to the scalability assessment. Rating each domain in real time, followed by reflection and discussion, facilitated information sharing and idea generation. The narrow range used for rating (0 to 3) may have had the effect of being less sensitive to response differences. The scalability assessment involved a diverse and knowledgeable group of participants, including patient and public research partners. However, participants identified a lack of clarity around some of the readiness assessment questions and struggled to foresee or predict program sustainability if scaled up due to unknowns, such as securing funding.

In the context of the pandemic and travel restrictions, the workshops were held online, rather than in-person as originally planned; this may have affected participation for some. We also conducted the workshop over a shorter duration, in recognition of the busy schedules of participants and the negative impact of prolonged screen time. The assessment was done at one point in time, and as such, readiness for scalability may change with changes in the political and practice context.

Conclusions

The scalability assessment process resulted in consensus that the CPP should be adapted and implemented using a phased approach (horizontal scale-up) with strong community and partner involvement. However, monitoring the impact and fidelity of these types of programs at scale is hampered by the lack of adequate informational technology infrastructure. Participants are committed to sustaining the collaborative working relationships developed during the trial and seek further funding opportunities to support the scale-up of the program into usual care of older adults with diabetes and multiple chronic conditions. The scalability assessment process was a practical method to generate concrete strategies to facilitate the uptake of the program into practice. Planning for scalability as part of implementation-effectiveness studies is of significant value in increasing the potential for health care system impact.

Abbreviations

CPP	Community Partnership Program
ISAT	Intervention Scalability Assessment Tool
RCT	Randomized controlled trial
PEI	Prince Edward Island

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12913-025-12378-5>.

Supplementary Material 1.

Acknowledgements

We wish to thank our partners: Scarborough Health Network, Unity Health Toronto – St. Michael's Hospital Academic Family Health Team, Carefirst Seniors and Community Services Association, the YMCA of Greater Toronto, University of Prince Edward Island, Health PEI, and PEI Department of Health and Wellness for their time, commitment, and ongoing collaboration on this research. Special thanks also go to the patient and public research partners for their valued experience and support of this work. We acknowledge the significant contributions to this program of research by Dr. Jenny Ploeg and Dr. Ruta Valaitis, Professors Emeriti, School of Nursing, McMaster University, and provide our thanks for her leadership and expertise. We also extend our thanks to the undergraduate and graduate students who collected evidence for the environmental scan and literature review: Meagan Boucher, Michelle Greenway, Hasti Mahboubi, and Aimun Shah.

Authors' contributions

MN, TC, KF, RG, and MMR contributed to the conception and design of the work; MN, TC, KF, RG, MMR, RB, GG, AG, HL, CL, KL, GM, EM, JM, CM, WM, AM, LS, MS, FT, and CW participated in data collection; MN, TC, KF, RG, MMR, and MY conducted the analysis and interpretation of data; MN drafted the work and TC, KF, RG, MMR, MY, AG, GM, JM, CW substantively revised it; and all authors reviewed and approved the submitted version.

Funding

This study is supported, in part, by funding from the Canadian Institutes of Health Research Strategy for Patient-Oriented Research (SPOR) Primary and Integrated Health Care Innovations Network: Programmatic Grants (Funding Reference Number: KPG-156883) in partnership with: Diabetes Action Canada, a Canadian Institutes for Health Research (CIHR) Strategy for Patient-Oriented Research Network in Chronic Disease (project reference #1.1.1ACHR); McMaster Institute for Research on Aging (Hamilton, ON); McMaster University School of Nursing; Réseau-1 Québec; Fonds de Recherche du Québec (FRQS); Scarborough Health Network Foundation. This research was also undertaken, in part, thanks to the funding from Dr. Markle-Reid's Tier 2 CIHR Canada Research Chair.

Data availability

The data for this research consists of questionnaires, interview transcriptions, and meeting notes. Raw data cannot be publicly released due to the risk of compromising participant confidentiality. For any data queries, please contact the first author.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the Tri-Council Policy Statement, Ethical Conduct for Research Involving Humans [26]. Verbal, informed consent was given by working group members, key informants, and participants in the knowledge exchange workshop. This study was approved by: the Hamilton Integrated Research Ethics Board (a collaboration of Hamilton

Health Sciences, McMaster University, and St. Joseph's Healthcare Hamilton; #5101); the Scarborough Health Network Research Ethics Board (#NEP-18-014); the Unity Health Toronto Research Ethics Board (#18336); University of Prince Edward Island Research Ethics Board (#6008019); Prince Edward Island Research Ethics Board; and Centre intégré universitaire de santé et de services sociaux (CIUSSS) de la Capitale-Nationale (MP13-2019-1670).

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Faculty of Health Sciences, Aging and Community Health Research Unit, School of Nursing, McMaster University, 1280 Main Street West, Hamilton, ON L8S 4L8, Canada. ²Department of Family Medicine Research Program, University of Alberta, 6-40 University Terrace, Edmonton, AB T6G 2T4, Canada. ³Carefirst Seniors and Community Services Association, 300 Silver Star Blvd., Scarborough, ON M1V 0G2, Canada. ⁴Ontario Health East, Ontario Health, 500-525 University Avenue, Toronto, ON M5G 2L3, Canada. ⁵Margaret and Wallace McCain Chair in Human Development and Health, Department of Applied Human Sciences, Faculty of Science, University of Prince Edward Island, Room 122, Health Sciences Building, 550 University Avenue, Charlottetown, Prince Edward Island C1A 4P3, Canada. ⁶Scarborough Health Network, Nephrology & Chronic Disease Management, 3050 Lawrence Ave. E, Scarborough, ON M1P 2V5, Canada. ⁷Health PEI Primary Care and Chronic Disease, Community Health and Seniors Care, 223 Queen Street, PO Box 2000, Charlottetown, Prince Edward Island C1A 6A5, Canada. ⁸Department of Health and Wellness, Government of Prince Edward Island, 3rd floor Sullivan Building, 16 Fitzroy Street, PO Box 2000, Charlottetown, Prince Edward Island C1A 7N8, Canada. ⁹Diabetes Action Canada, Toronto General Hospital, 200 Elizabeth Street, Eaton Building, Room 12E244, Toronto, ON M5G 2C4, Canada.

Received: 3 December 2024 Accepted: 5 February 2025

Published online: 20 February 2025

References

1. Milat A, Lee K, Conte K, Grunseit A, Wolfenden L, van Nassau F, et al. Intervention scalability assessment tool: A decision support tool for health policy makers and implementers. *Health Res Policy Syst.* 2020;18(1). <https://doi.org/10.1186/s12961-019-0494-2>.
2. World Health Organization. Beginning with the end in mind: Planning pilot projects and other programmatic research for successful scaling up. 2011. <https://www.who.int/publications/i/item/9789241502320>
3. Barr VJ, Robinson S, Marin-Link B, Underhill L, Dotts A, Ravensdale D, Salivaras S. The expanded chronic care model: An integration of concepts and strategies from population health promotion and the chronic care model. *Hosp Q.* 2003;7(1):73–82.
4. Ben Charif A, Zomahoun HTV, LeBlanc A, Langlois L, Wolfenden L, Yoong SL, et al. Effective strategies for scaling up evidence-based practices in primary care: a systematic review. *Implement Sci.* 2017;12(139). <https://doi.org/10.1186/s13012-017-0672-y>.
5. Milat AJ, Newson R, King L, Rissel C, Wolfenden L, Bauman A, et al. A guide to scaling up population health interventions. *Public Health Res Pract.* 2016;26(1):e2611604. <https://doi.org/10.17061/phrp2611604>.
6. Calnan S, Lee K, McHugh S. Assessing the scalability of an integrated falls prevention service for community-dwelling older people: a mixed methods study. *BMC Geriatrics.* 2022;22(17). <https://doi.org/10.1186/s12877-021-02717-6>.
7. Ben Charif A, Zomahoun HTV, Gogovor A, Abdoulaye Samir M, Massoug-bodji J, Wolfenden L, et al. Tools for assessing the scalability of innovations in health: a systematic review. *Health Res Policy Syst.* 2022;20(1):34. <https://doi.org/10.1186/s12961-022-00830-5>.
8. Nundy S, Cooper LA, Mate KS. The Quintuple aim for health care improvement: a new imperative to advance health equity. *JAMA.* 2022;327(6):521–2. <https://doi.org/10.1001/jama.2021.25181>.

9. Indig D, Lee K, Grunseit A, Milat A, Bauman A. Pathways for scaling up public health interventions. *BMC Public Health*. 2017;18(1):68. <https://doi.org/10.1186/s12889-017-4572-5>.
10. Milat A, Lee K, Grunseit A, Conte K, Wolfenden L, Bauman A. Intervention Scalability Assessment Tool. The Australian Partnership Centre; 2019. https://preventioncentre.org.au/wp-content/uploads/2019/11/The-ISAT-Oct-2019_FINAL.pdf
11. Skivington K, Matthews L, Simpson SA, Craig P, Baird J, Blazeby JM, et al. A new framework for developing and evaluating complex interventions: update of Medical Research Council guidance. *BMJ*. 2021;374:n2061. <https://doi.org/10.1136/bmj.n2061>.
12. Markle-Reid M, Ploeg J, Fisher K, Reimer H, Kaasalainen S, Gafni A, et al. The aging, community and health research unit-community partnership program for older adults with type 2 diabetes and multiple chronic conditions: a feasibility study. *Pilot Feasib Stud*. 2016;2:24. <https://doi.org/10.1186/s40814-016-0063-1>.
13. Markle-Reid M, Ploeg J, Fraser KD, Fisher KA, Akhtar-Danesh N, Bartholomew A, et al. The ACHRU-CPP versus usual care for older adults with type-2 diabetes and multiple chronic conditions and their family caregivers: study protocol for a randomized controlled trial. *Trials*. 2017;18(1):55. <https://doi.org/10.1186/s13063-017-1795-9>.
14. Markle-Reid M, Ploeg J, Fraser KD, Fisher KA, Bartholomew A, Griffith LE, et al. Community program improves quality of life and self-management in older adults with diabetes mellitus and comorbidity. *J Am Geriatr Soc*. 2018;66(2):263–73. <https://doi.org/10.1111/jgs.15173>.
15. Ploeg J, Markle-Reid M, Valaitis R, Fisher K, Ganann R, Blais J, et al. The Aging, Community and Health Research Unit Community Partnership Program (ACHRU-CPP) for older adults with diabetes and multiple chronic conditions: Study protocol for a randomized controlled trial. *BMC Geriatr*. 2022;22(1):99. <https://doi.org/10.1186/s12877-021-02651-7>.
16. Miklavcic JJ, Fraser KD, Ploeg J, Markle-Reid M, Fisher K, Gafni A, et al. Effectiveness of a community program for older adults with type 2 diabetes and multimorbidity: A pragmatic randomized controlled trial. *BMC Geriatr*. 2020;20(1):174. <https://doi.org/10.1186/s12877-020-01557-0>.
17. Curran GM, Bauer MS, Mittman B, Pyne JM, Stetler CB. Effectiveness-implementation hybrid designs: Combining elements of clinical effectiveness and implementation research to enhance public health impact. *Med Care*. 2012;50(3):217–26. <https://doi.org/10.1097/MLR.0b013e3182408812>.
18. Hoffmann TC, Glasziou PP, Boutron I, Milne R, Perera R, Moher D, et al. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ*. 2014;348:g1687. <https://doi.org/10.1136/bmj.g1687>.
19. Amirthavasar G, Dudar N, Gandhi S, Phillips S, Sherifali D. The landscape of diabetes education in Ontario: A descriptive overview. *Can J Diabetes*. 2012;36:204–9. <https://doi.org/10.1016/j.cjcd.2012.07.006>.
20. Government of Prince Edward Island. First five Patient Medical Homes launched: Government of Prince Edward Island. 2022. Available from: <https://www.princeedwardisland.ca/en/news/first-five-patient-medical-homes-launched>.
21. Charlton P, Doucet S, Azar R, Nagel DA, Boulos L, Luke A, et al. The use of the environmental scan in health services delivery research: a scoping review protocol. *BMJ Open*. 2019;9(9):e029805. <https://doi.org/10.1136/bmjopen-2019-029805>.
22. Yous ML, Ganann R, Ploeg J, Markle-Reid M, Northwood M, Fisher K, et al. Older adults' experiences and perceived impacts of the Aging, Community and Health Research Unit-Community Partnership Program (ACHRU-CPP) for diabetes self-management in Canada: a qualitative descriptive study. *BMJ Open*. 2023;13(4):e068694. <https://doi.org/10.1136/bmjopen-2022-068694>.
23. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277–88. <https://doi.org/10.1177/1049732305276687>.
24. Foley T, Vale LA. A framework for understanding, designing, developing and evaluating learning health systems. *Learn Health Syst*. 2022;7(1):e10315. <https://doi.org/10.1002/lrh2.10315>.
25. Damschroder LJ, Reardon CM, Widerquist MAO, Lowery J. The updated consolidated framework for implementation research based on user feedback. *Implement Sci*. 2022;17(1):75. <https://doi.org/10.1186/s13012-022-01245-0>.
26. Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, Social Sciences and Humanities Research Council of Canada. TriCouncil Policy Statement: Ethical Conduct for Research Involving Humans. 2022. www.pre.ethics.gc.ca.
27. Northwood M, Markle-Reid M, Ganann R, Fisher K, Chambers T. A scalability assessment of the Aging, Community and Health Research Unit (ACHRU) Community Partnership Program for diabetes self-management for older adults with multimorbidity and their care partners in Ontario: Final report. McMaster University; 2023. Available from: <https://achru.mcmaster.ca>.
28. Northwood M, Markle-Reid M, Ganann R, Fisher K, Chambers T. A scalability assessment of the Aging, Community and Health Research Unit (ACHRU) Community Partnership Program for diabetes self-management for older adults with multimorbidity and their care partners in Prince Edward Island: Final report: McMaster University; 2023. Available from: <https://achru.mcmaster.ca/>.
29. Health PEI. Health PEI Diabetes Strategy 2020–2024. 2019. https://www.princeedwardisland.ca/sites/default/files/publications/diabetes_strategy_2020_2024.pdf
30. Ontario Health. Ontario Health Business Plan (2022–2023). 2022. https://www.ontariohealth.ca/sites/ontariohealth/files/2022-05/OHBusinessPlan22_23.pdf
31. Corôa RC, Gogovor A, Ben Charif A, Ben Hassine A, Zomahoun HTV, McLean RKD, et al. Evidence on scaling in health and social care: An umbrella review. *Milbank Q*. 2023;101(3):881–921. <https://doi.org/10.1111/1468-0009.12649>. Epub 2023 Apr 25.
32. Valentijn PP, Schepman SM, Opheij W, Bruijnzeels MA. Understanding integrated care: A comprehensive conceptual framework based on the integrative functions of primary care. *Int J Integr Care (IJIC)*. 2013;13(22 March):1–12 URN:NBN:NL:U1:10-1-114415.
33. Wiltsey Stirman S, Baumann AA, Miller CJ. The FRAME: an expanded framework for reporting adaptations and modifications to evidence-based interventions. *Implement Sci*. 2019;14(1):58. <https://doi.org/10.1186/s13012-019-0898-y>.
34. Shelton RC, Rhoades Cooper B, Wiltsey SS. The sustainability of evidence-based interventions and practices in public health and health care. *Annu Rev Public Health*. 2018;39:55–76. <https://doi.org/10.1146/annurev-publhealth-040617-014731>.
35. Reid RJ, Greene SM. Gathering speed and countering tensions in the rapid learning health system. *Learn Health Syst*. 2023;7:e10358. <https://doi.org/10.1002/lrh2.10358>.
36. Wodchis WP, Dixon A, Anderson GM, Goodwin N. Integrating care for older people with complex needs: Key insights and lessons from a seven-country cross-case analysis. *Int J Integr Care (IJIC)*. 2015;15(23). <https://doi.org/10.5334/2Fijic.2249>.
37. Integrated Foundation for Integrated Care. Nine pillars of integrated care n.d. Available from: <https://integratedcarefoundation.org/nine-pillars-of-integrated-care#1635761492753-956b9f90-0968>. Accessed 09 Feb 2025.
38. Hirdes JP, Retalic T, Muskat C, Morris JN, Katz PR. The Seniors Quality Leap Initiative (SQLI): An international collaborative to improve quality in long-term care. *J Am Med Dir Assoc*. 2020;21(12):1931–6. <https://doi.org/10.1016/j.jamda.2020.07.024>.
39. Lee K, van Nassau F, Grunseit A, Conte K, Milat A, Wolfenden L, Bauman A. Scaling up population health interventions from decision to sustainability: A window of opportunity? A qualitative view from policy-makers. *Health Res Policy Syst*. 2020;18(118). <https://doi.org/10.1186/s12961-020-00636-3>

40. Miksch A, Hermann A, Rölz S, Joos S, Szecsenyi D, et al. Additional impact of concomitant hypertension and osteoarthritis on quality of life among patients with type 2 diabetes in primary care in Germany: A cross-sectional survey. *Health Qual Life Outcomes*. 2009;27(7):19. <https://doi.org/10.1186/1477-7525-7-19>.
41. Statistics Canada. Diabetes, by age group; 2022. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310009607>. Accessed 28 Jan 2022.
42. World Health Organization. Global Report on Diabetes; World Health Organization; 2016. <https://www.who.int/publications/i/item/9789241565257>.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.