Implementation of interprofessional primary care teams in Nova Scotia: Results of a survey and knowledge sharing event

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Abstract

Background: Interprofessional primary care teams (IPCTs) work together to enhance care. Despite evidence on the benefits of IPCTs, implementation remains challenging. This research aims to 1) validate and prioritize barriers and enablers, and 2) co-develop team-level strategies to support IPCT implementation in Nova Scotia, Canada.

Methods: Healthcare providers and staff of IPCTs were invited to complete an online survey to identify barriers and enablers, and the degree to which each item impacted the functioning of their team. Top ranked items were identified using the sum of frequency x impact for each response. A virtual knowledge sharing event was held to identify strategies to address local barriers and enablers that impact team functioning.

Results: IPCT members (n=117), with a mix of clinic roles and experience, completed the survey. The top three enablers identified were related to access and use of technological tools and having a team manager to coordinate collaboration. The top three barriers were limited opportunity for daily team communication, lack of conflict resolution strategies, and lack of capacity building opportunities. IPCT members, administrators, and patients attended the knowledge sharing event (n=33). Five strategies were identified including balancing patient needs and provider scope of practice, holding regular meetings, supporting team and professional development, and supporting involvement in non-clinical activities.

Interpretation: This research contextualized evidence to further understand local perspectives and experiences of barriers and enablers to the implementation of IPCTs. The knowledge exchange event identified actionable strategies that IPCTs and healthcare administrators can tailor to support teams and care for patients.

Introduction

Shortages in primary care access have been documented in North America for the past 20 years (1–3). In Canada, although the number of primary care physicians per citizen has increased over time (4), the amount of clinical activity has decreased (5,6). Concurrently, there has been an increase in patient demand given a growing population and increasing complexity of patient care needs (7–9). The primary care system in Nova Scotia, Canada faces similar challenges (10,11). The number of people in the province who identify as needing a regular family practice provider has doubled over a 3-year period (12), despite the provincial primary care workforce growing by 58 family physicians and 118 NPs during that time (13).

Improving access to primary care through the development of interprofessional teams has been a national goal since the early 2000s (14), with advocates recently calling for an expansion of team-based primary care for a system in crisis (15,16). Interprofessional Primary Care Teams (IPCTs) are an approach to the delivery of primary care that involves three or more healthcare providers (HCPs), at least two of whom are different professions (e.g. family physicians, nurse practitioners, social workers), who work

interdependently to provide high-quality patient care (17). IPCTs reduce wait times, improve care coordination, contribute to more appropriate referrals, reduce duplication of services and emergency department visits (18–20), improve patient outcomes, and reduce HCP burnout (21–24). In Nova Scotia, IPCTs have demonstrated positive impacts on accessibility (25,26), chronic disease prevention and management (27), and patient satisfaction (26).

Despite challenges in accessing primary care (12,28) and calls for increasing the number of and support for IPCTs, implementation has varied across Canada (29,30) and internationally (30–32), both in how quickly teams have been implemented (33–35) and the mix of HCPs included (36). Implementation strategies that are responsive to local contexts (41), or tailored to individual, team, or policy levels (37–40), have greater uptake (40). A literature review was conducted to identify theoretically-informed barriers and enablers to IPCT implementation (43), using the Consolidated Framework for Implementation Research (CFIR) (44). Building on this work, the current study aimed to support the continued implementation of IPCTs by 1) validating and prioritizing barriers to and enablers of implementation by IPCT team members, and 2) co-creating team-level strategies to mitigate and/or enhance the prioritized barriers and enablers, respectively, through a knowledge sharing event.

Methods

This study was performed in accordance with the Declaration of Helsinki and approved by the appropriate ethics committee. Ethics approval was obtained from Nova Scotia Health (NSH), Research Ethics Board (Approval #1026183). For the survey portion of the study, consent was implied by opening and completing the survey, which was described in the information provided to potential participants. For the knowledge sharing event, the need for informed consent was waived by the ethics board as the nature of the event involved mutual sharing of information and co-development of implementation strategies. All methods were carried out in accordance with relevant guidelines and regulations.

Aim I: Validating and prioritizing barriers and enablers

Survey Development

Barriers and enablers to IPCT implementation were identified via a literature review (43) using the CFIR (44), which the research team used to create the survey (Appendix A). Survey items were identified through a three-step process of item reduction, consolidation, and transformation (Figure 1). The survey focused on items within *Domain III – Inner setting* or *Characteristics of the Team* to detect strategies that could be enacted at the practice level.

The barriers and enablers identified in the literature review were combined into shared concepts and consolidated into opposing barrier and enabler statements (n=21) to prompt respondents to identify whether they had experienced each item as a barrier, enabler, or neither. In the second stage of the survey, respondents rated selected items on a 5-point Likert scale (1 = no impact to 5 = significant impact). The

survey also contained an open-ended question on barriers and enablers to IPCT implementation. Demographic information (e.g., role, time with team) was also collected.

Survey Recruitment

The survey was administered using REDCap™ (45,46). Members of IPCTs (n=85 teams at the time of the survey) in Nova Scotia including HCPs, managers, administrative staff, and health service leads (for role definitions see: https://cfpt.nshealth.ca/team-members) were invited to participate via email from the Director of each of the four Primary Health Care health service management zones. Three reminder emails were sent at two-week intervals (47). Targeted recruitment from Directors was used when there was a low response rate within a zone or from specific professions to maximize the number of respondents. Respondents were also offered a chance to win one of five $100 gift cards.

Survey Data Analysis

Data were analyzed using SPSSV26.0 (48). Demographic information and questionnaire responses were summarized using descriptive statistics. For each potential barrier and facilitator, a sum score was generated from the product of its frequency (number of respondents who indicated they had experienced the item) and its impact (response item selected on the 5-point Likert scale). The summed scores for each statement were compared across participant roles and other demographics, and combined scores were used to determine prioritization rankings. Responses to the open-ended question was analyzed deductively to the CFIR domains by one team member (SA) and inductively using content analysis to identify overarching themes (49). Results are reported in accordance with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) (50).

Part II: Co-creating strategies

A two-hour, virtual knowledge sharing event was held on October 20, 2022 to: 1) share survey findings and 2) co-create strategies to mitigate and/or enhance priority barriers and enablers.

Recruitment for Knowledge Sharing Event

Recruitment was purposive to attract participation from IPCT HCPs and staff, Primary Health Care Leads and Managers, patients and caregivers, and government representatives. Invitations were emailed by Zone Directors to Zone Health Service Managers to IPCTs. Existing Patient and Family Advisors and MSSU Patient Public Partners were also emailed invitations by Patient Engagement Advisors. Participants completed an online registration that collected information about their roles and where they work to help assign individuals to breakout groups. Prior to the event, participants were sent the event objectives, agenda, and discussion topics.

Event structure

Following an overview of the literature review and survey results, participants were split into pre-assigned groups, with a mix of participants based on role and practice location, for world café-style discussions (51). Experienced interprofessional facilitators were each assigned one topic: team organization and coordination supports; communication tools and technology; role clarity and relationships; goals and feedback; or availability of resources and leadership engagement. Each topic was associated with priority barriers and enablers, and a set of prompt questions (Appendix B). Each facilitator met with two breakout groups, such that each breakout group had the opportunity to discuss two topics. Following the event, participants were invited to complete an online event evaluation survey using Select Survey v5.0 (52). Participants responded to statements about the event objectives and possible applications on 5-point Likert scale ranging from strongly agree to strongly disagree or very likely to very unlikely. Responses were collapsed into agree (i.e., strongly agree, agree), neutral, or disagree (i.e., disagree, strongly disagree).

Knowledge Sharing Event Analysis

A content analysis of audio/video recordings of breakout group discussions identified overarching themes, strategies, and actions to address the barriers and enablers discussed (49). Five team members independently coded breakout group discussions for one topic (AG, AB, AMir, RG, EL), and met to compare their analyses, and to revise and agree on the coding. Two team members (AB, AMir) independently coded the next recording, and then again met to compare results and discuss with the coding team. The remaining topics were double-coded (AB, AMir). Discrepancies were resolved by group consensus. Findings were consolidated into strategies and actions by one team member (AB) and were reviewed by the full study team.

Results

Part I: Survey

The survey was partially (n=94) or fully (n=93) completed by 187 respondents. Respondents who only completed the demographic portion of the survey were excluded from the analysis (n=70). Respondents' demographic characteristics are summarized in Table 1. The top three enablers and barriers are identified in Table 2. The top three enablers were related to technological tools and organizational supports and the top three barriers were communication and information sharing, team culture and climate, and education and training.

The top ranked barriers and enablers were compared across participant roles (Table 3). The ranking of the top three enablers was similar across participant roles, however there were differences in rankings across the remaining items. For example, nurses and administrators/managers identified the importance of clear operating procedures (Statement 1) in their top 7, whereas this was ranked 13 by medical doctors (MDs). There were similar rankings across the top three barriers. MDs ranked items related to collaborative care and scope of practice (Statements 10, 19) higher than other respondents. Conversely, administrators/managers ranked items about leadership and organizational supports (Statements 12, 13) more highly than those in clinical roles.

Twenty-three respondents (20%) answered an open-ended question about barriers and enablers that were not part of the pre-defined survey statements. Themes identified included: leadership (importance of trust and respect), funding models (fee-for-service models impacting time for collaboration), and the built environment (shared space) (Table 4).

The top 10 barriers and enablers from the survey were grouped into five categories and discussed at the knowledge sharing event (Appendix B).

Part II: Co-creating strategies

Thirty-three stakeholders participated in the knowledge sharing event, with a mix of roles and health service management zones represented (Table 5). Four overarching themes were identified: 1) Considering and consulting the community to address community and patient needs alongside the needs of the practice; 2) Tailoring implementation strategies and approaches to the needs of individual clinics; 3) Clear and consistent communication is crucial and requires dedicated resources; and 4) Practice governance and funding models need to be designed to support team collaboration. Each of these themes represent considerations that support multiple implementation strategies and impact all levels of implementation (patients and caregivers; individual providers; teams; and policy and organizations). Five multi-modal implementation strategies with 26 associated actions were identified during breakout group discussions (Table 7). A visual summary of these themes, strategies, and actions is available online.

The post-event survey was fully or partially completed by 18 event participants (54.5%) (Table 6). Most respondents (83%) agreed that they gained a greater understanding of the barriers and enablers to IPCT implementation and heard perspectives they otherwise would not have heard (82%). Similary, most respondents felt that they engaged with others to brainstorm strategies (76%) and that the event provided an effective means of doing so (71%). However, of those who responded to questions about application, fewer respondents indicated that they were likely to apply strategies identified through the event (69%).

Interpretation

This research prioritized barriers and enablers, and co-developed team-level strategies to support implementation of IPCTs in Nova Scotia. To our knowledge, this is the first research to collect contextually relevant data on barriers and enablers to IPCTs in the province. Top enablers identified by IPCT members were related to technological tools (e.g., EMRs) and management supports. Top barriers focused on communication, including limited opportunities to discuss issues and processes to resolve conflicts. A lack of interprofessional training opportunities was also identified as a top barrier.

The survey findings reflect the broader literature around barriers and enablers identified using the CFIR in a recent narrative review (43). For example, items coded within the *Communication Tools & Technology* CFIR construct (constructs are subcategories nested within CFIR domains) in the broader literature were frequently identified, though more often as barriers. The survey findings identified technological tools as a top enabler, while communication was a top barrier. *Available resources* were also frequently identified

in the literature, which was reflected in the survey findings but focused specifically on the enabling function of management supports within the team. This contextual information disentangles what is working and not working well locally and will enable more focused intervention and supports.

The knowledge sharing event provided a low-cost, casual forum (53) for local primary care stakeholders to co-create actionable strategies that IPCTs and healthcare administrators can tailor to support teams and care for patients. The five strategies and 26 associated actions identified focus on optimizing scopes of practice to balance patient care needs and HCPs ability to meet those needs, having regular and accessible interprofessional meetings, supporting team and professional development, as well as finding ways to support the work involved in non-clinical administrative activities. No priority was assigned to strategies or related actions given that there is need to tailor strategies during implementation (42,54). Rather, these strategies serve as options for team members and stakeholders (e.g., health service managers) to consider for their particular practice conditions. The need to further tailor actions to practice needs may also explain why fewer respondents indicated an intention to apply strategies on the event evaluation—not all strategies will be appropriate for all settings and, as indicated by some participants, some strategies have already been implemented within IPCTs.

Despite the focus on team-based factors, several actions were associated with patients and caregivers. These actions clustered primarily within a single strategy, 'Optimize scope of practice to balance patient care and provider needs,' and focused on gathering patient and caregiver perspectives and providing a medium for anonymous feedback. Discussions reflected the importance of trust and highlighted complementary motivations. For example, when discussing a desire to avoid physicians always working to their full scope of practice, patients voiced the importance of developing relationships with physicians prior to having a serious health concern, while clinicians and health service managers cited the need to avoid burnout. This reflects patients' openness to being treated by various practice members (20), but also provides an example of how patient perspectives can help to optimize scope of practice and enable patient-centred care (24,55). Future research could aim to identify how best to incorporate patient and caregiver perspectives into the implementation of IPCTs.

The role of leadership in creating a culture of collaboration to support change was also identified as an enabler in the survey yet was not discussed at the knowledge sharing event. Since the discussion topics focused on team-level functions, this may have directed conversation away from individual actions and leadership. This gap may also be partially attributable to recruitment bias, as participants tended to describe positive experiences with well-functioning teams.

Limitations

This review focused on features of the team, however, change may also be needed in other domains of the CFIR such as the outer setting (i.e., policy/health authority), or at the individual level where more personalized interventions would need to be developed. The strategies and actions identified provide a useful starting point for IPCTs to determine which strategies are most appropriate in their setting, when or

how often to implement a change (53), and to refine the action during implementation (56). Study recruitment was a challenge, as it was difficult to find an appropriate time during the COVID-19 pandemic to both launch a survey and to host a collaborative event, as primary care and health care workers were under pressure. Despite this, we were able to recruit a mix of professional roles, with varying practice characteristics, with fairly broad geographic representation. However, it is still possible that those who participated represented well-functioning teams whose positions afforded them the time to participate in these non-clinical activities.

Conclusions

There is currently a strong focus on improving implementation of IPCTs both nationally (57) and provincially, which focuses on accessing care from the right provider, at the right time (58). Given increasing issues with primary care access, with 15% of the provincial population currently waiting for a primary care provider (59), the need to focus on evidence-informed ways to improve implementation of IPCTs has never been more timely. These findings provide interprofessional, theoretically informed evidence about priority barriers and enablers of IPCT implementation in Nova Scotia, as well as a set of co-developed implementation strategies and actions that can be tailored to enhance implementation.

Declarations

Ethics approval and consent to participate

Ethics approval was obtained from Nova Scotia Health (NSH), Research Ethics Board (Approval #026183) having approved all experimental protocols. Informed consent was waived by Nova Scotia Health Research Ethics Board and consent to participate in the survey was implied. Participants were informed that consent was implied after opening and completing the online survey. No identifying information was collected from participants. Consent was not required for the Knowledge Sharing Event, as this was a mutual learning event, with the goal of co-developing implementation strategies.

Consent for publication

Not applicable.

Availability of data and materials

All data generated or analyzed during this study are included in this published article [and its supplementary information files].

Competing interests

The authors have no competing interests related to this manuscript to declare.

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Authors' contributions

AG, RG, KL, AMac, EJ, JK, EGM, SP, DSL, DSL, DB, LC, RMM were all involved in the conception and design of the research study. AG, RG, AB, AM contributed to writing the first draft of the manuscript. AG, KL, AMac, EJ, JK, EGM, SP, DSL, LC, and RMM were involved in the collection of survey data. AG, RG, KL, AM, EJ, JK, EGM, SP, DSL, EL, AB, AM, DB, LC, and RMM were involved in the planning of and/or participation in the knowledge sharing event. All authors contributed to the data analysis and interpretation of results, and have approved the final version of the submitted manuscript.

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References

1. Tyrrell L, Dauphinee D, Scully H. Task force on physician supply in Canada. In Canadian Medical Forum; 1999.
2. Government of Canada SC. Access to a regular medical doctor, 2014 [Internet]. 2015 [cited 2023 Jan 24]. Available from: https://www150.statcan.gc.ca/n1/pub/82-625-x/2015001/article/14177-eng.htm.
3. Primary Care Health Professional Shortage Areas (HPSAs) [Internet]. KFF. 2022 [cited 2023 Jan 24]. Available from: https://www.kff.org/other/state-indicator/primary-care-health-professional-shortage-areas-hpsas/.
4. Canadian Institute for Health Information (CIHI). Supply, distribution, and migration of physicians in Canada, 2013: data tables [Internet]. Canadian Institute for Health Information (CIHI); 2017 [cited 2023 Jan 24]. Available from: https://secure.cihi.ca/estore/productFamily.htm?pf=PFC4984 =en&media=0.
5. Hedden L, Barer ML, McGrail K, Law M, Bourgeault IL. British Columbia, The Supply Of Primary Care Physicians Grew, But Their Rate Of Clinical Activity Declined. Health Aff (Millwood). 2017;36(11):1904–11.
6. Rudoler D, Peterson S, Stock D, Taylor C, Wilton AS, Blackie D et al. Do recent family physician graduates practice differently? A longitudinal study of primary care visits and continuity in four

Canadian provinces [Internet]. Primary Care Research; 2022 Mar [cited 2023 Jan 25]. http://medrxiv.org/lookup/doi/10.1101/2022.03.11.22272161.

7. Hofer AN, Abraham JM, Moscovice I. Expansion of Coverage under the Patient Protection and Affordable Care Act and Primary Care Utilization. Milbank Q. 2011;89(1):69–89.
8. Petterson SM, Liaw WR, Phillips RL, Rabin DL, Meyers DS, Bazemore AW. Projecting US Primary Care Physician Workforce Needs: 2010–2025. Ann Fam Med. 2012;10(6):503–9.
9. Tinetti ME, Fried TR, Boyd CM. Designing Health Care for the Most Common Chronic Condition—Multimorbidity. JAMA [Internet]. 2012 Jun 20 [cited 2023 Jan 24];307(23). Available from: http://jama.jamanetwork.com/article.aspx?doi=10.1001/jama.2012.5265.
10. Capstone GS4000, ArcGIS StoryMaps. 2023 [cited 2023 Aug 15]. Nova Scotia: An Aging Population. Available from: https://storymaps.arcgis.com/stories/a395cca7d0b242d783f80d80c6238acf.
11. Nova Scotia Public Health. Nova Scotia Health Profile 2015 [Internet]. 2015 [cited 2023 Aug 15]. Available from: https://novascotia.ca/dhw/publichealth/documents/Population-Health-Profile-Nova-Scotia.pdf.
12. Nova Scotia Health Authority. Reports, Statistics, and Accountability [Internet]. 2021. Available from: http://www.nshealth.ca/reports-statistics-and-accountability#finding-a-primary-care-provider-reporting.
13. Province of Nova Scotia. Action for Health: Solution 1 [Internet]. Available from: https://novascotia.ca/actionforhealth/solution-1/#c-graph–1_20.
14. Canadian Intergovernmental Conference Secretariat. Canadian Intergovernmental Conference Secretariat. 2000. Ontario Communiqué on Health First Ministers' Meeting Ottawa on September 11, 2000. Available from: http://www.scics.gc.ca/english/conferences.asp?x=1&a=viewdocument&id=688.
15. Bodenheimer T. Revitalizing Primary Care, Part 2: Hopes for the Future. Ann Fam Med. 2022;20(5):469–78.
16. Kiran T. Keeping the front door open: ensuring access to primary care for all in Canada. Can Med Assoc J. 2022;194(48):E1655–6.
17. Canadian Nurses Association. Primary health care: A summary of the issues. Ottawa, ON: Canadian Nurses Association; 2005.
18. Cowling TE, Cecil EV, Soljak MA, Lee JT, Millett C, Majeed A et al. Access to primary care and visits to emergency departments in England: a cross-sectional, population-based study. PLoS One. 2013/06/19 ed. 2013;8(6):e66699–e66699.
19. McMurchy D. What are the Critical Attributes and Benefits of a High-Quality Primary Healthcare System? [Internet]. Ottawa: Canadian Health Services Research Foundation; 2009. Available from: http://www.cfhifcass.ca/sf-docs/default-source/primaryhealthcare/11498_PHC_McMurchy_ENG_FINAL.pdf.
20. Shi L. The impact of primary care: a focused review. Sci Cairo. 2012/01/01 ed. 2012;432892–432892.

21. Barrett J, Curran V, Glynn L, Godwin M. Canadian Health Services Research Foundation. CHSRF synthesis: Interprofessional collaboration and quality primary healthcare. 2007.
22. Helfrich CD, Dolan ED, Simonetti J, Reid RJ, Joos S, Wakefield BJ, et al. Elements of Team-Based Care in a Patient-Centered Medical Home Are Associated with Lower Burnout Among VA Primary Care Employees. J Gen Intern Med. 2014;29(S2):659–66.
23. Reiss-Brennan B, Brunisholz KD, Dredge C, Briot P, Grazier K, Wilcox A, et al. Association of Integrated Team-Based Care With Health Care Quality, Utilization, and Cost. JAMA. 2016;316(8):826.
24. Safran DG. Defining the future of primary care: what can we learn from patients? Ann Intern Med. 2003;138(3):248–55.
25. Callaghan K, Martin-Misener R, O'Connell C, Burge F, Marshall EG. Comparison of Access to Nurse Practitioners in Primary Healthcare across Three Team Structures. Nurs Leadersh Tor Ont. 2017/01/01 ed. 2017;30(4):67–79.
26. Martin-Misener R, Downe-Wamboldt B, Cain E, Girouard M. Cost effectiveness and outcomes of a nurse practitioner–paramedic–family physician model of care: the Long and Brier Islands study. Prim Health Care Res Dev. 2009;10(1):14–25.
27. Lawson B, Dicks D, Macdonald L, Burge F. Using quality indicators to evaluate the effect of implementing an enhanced collaborative care model among a community, primary healthcare practice population. Nurs Leadersh Tor Ont. 2012/09/27 ed. 2012;25(3):28–42.
28. Canadian Institute for Health Information., CIHI. How Canada Compares: Results from the Commonwealth Fund's 2020 International Health Policy Survey of the General Population in 11 Countries - Methodology Notes. Ottawa, ON; 2021.
29. Health Canada, First Ministers Health Accord. 2003. 2006; Available from: https://www.canada.ca/en/health-canada/services/health-care-system/health-care-system-delivery/federal-provincial-territorial-collaboration/2003-first-ministers-accord-health-care-renewal/2003-first-ministers-health-accord.html.
30. Martin-Misener R, McNab J, Sketris IS, Edwards L. Collaborative practice in health systems change: the Nova Scotia experience with the Strengthening Primary Care Initiative. Nurs Leadersh Tor Ont. 2004/07/09 ed. 2004;17(2):33–45.
31. Gocan S, Laplante MA, Woodend K. Interprofessional collaboration in Ontario's family health teams: a review of the literature. J Res Interprofessional Pract Educ. 2014;3(3).
32. Sicotte C, D'Amour D, Moreault MP. Interdisciplinary collaboration within Quebec community health care centres. Soc Sci Med. 2002;55(6):991–1003.
33. Buchan J, Poz MRD. Skill mix in the health care workforce: reviewing the evidence. Bull World Health Organ. 2002.
34. Richards A, Carley J, Jenkins-Clarke S, Richards DA. Skill mix between nurses and doctors working in primary care-delegation or allocation: a review of the literature. Int J Nurs Stud. 2000;37(3):185–97.
35. Sibbald B, Shen J, Mcbride A. Changing the skill-mix of the health care workforce. J Health Serv Res Policy. 2004;9(1suppl):28–38.

36. Freund T, Everett C, Griffiths P, Hudon C, Naccarella L, Laurant M. Skill mix, roles and remuneration in the primary care workforce: Who are the healthcare professionals in the primary care teams across the world? Int J Nurs Stud. 2015;52(3):727–43.
37. Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. Implement Sci. 2012;7(1):37.
38. Powell BJ, Waltz TJ, Chinman MJ, Damschroder LJ, Smith JL, Matthieu MM, et al. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. Implement Sci. 2015;10(1):21.
39. Waltz TJ, Powell BJ, Chinman MJ, Smith JL, Matthieu MM, Proctor EK, et al. Expert recommendations for implementing change (ERIC): protocol for a mixed methods study. Implement Sci. 2014;9(1):39.
40. Waltz TJ, Powell BJ, Matthieu MM, Damschroder LJ, Chinman MJ, Smith JL, et al. Use of concept mapping to characterize relationships among implementation strategies and assess their feasibility and importance: results from the Expert Recommendations for Implementing Change (ERIC) study. Implement Sci. 2015;10(1):109.
41. Chambers DA, Glasgow RE, Stange KC. The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. Implement Sci. 2013;8(1):117.
42. Wensing M. The Tailored Implementation in Chronic Diseases (TICD) project: introduction and main findings. Implement Sci IS. 2017;12(1):5.
43. Grant A, Kontak J, Jeffers E, Lawson B, MacKenzie A, Burge F et al. Barriers and enablers to implementing Interprofessional Collaborative Teams in Primary Care: A narrative review of the literature using the Consolidated Framework for Implementation Research. 2023.
44. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci. 2009;4(1):50.
45. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42(2):377–81.
46. Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O'Neal L, et al. The REDCap consortium: Building an international community of software platform partners. J Biomed Inform. 2019;95:103208.
47. Dillman DA, Smyth JD, Christian LM, Dillman DA. Internet, mail, and mixed-mode surveys: the tailored design method. 3rd ed. Hoboken, N.J: Wiley & Sons; 2009. p. 499.
48. IBM Corp. IBM SPSS Statistics for Windows. Armonk, NY: IBM Corp; 2019.
49. Hsieh HF, Shannon SE. Three Approaches to Qualitative Content Analysis. Qual Health Res. 2005;15(9):1277–88.
50. Eysenbach G. Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). J Med Internet Res. 2004;6(3):e34.

51. Löhr K, Weinhardt M, Sieber S. The World Café as a Participatory Method for Collecting Qualitative Data. Int J Qual Methods. 2020;19:1609406920916976.
52. SelectSurvey. Powered by SelectSurvey.NET v5.058.012 1998–2023 © ClassApps Inc. 2023.
53. Proctor EK, Powell BJ, McMillen JC. Implementation strategies: recommendations for specifying and reporting. Implement Sci. 2013;8(1):139.
54. Wilson P, Kislov R. Implementation Science. Elem Improv Qual Saf Healthc [Internet]. 2022 Oct [cited 2023 Jan 31]; Available from: https://www.cambridge.org/core/elements/implementation-science/9E9361E2F6C1A3B894C6D202031ECD19.
55. Sampalli T, Edwards L, Christian E, Kohler G, Bedford L, Demmons J et al. A Patient-Centred Redesign Framework to Support System-Level Process Changes for Multimorbidities and Chronic Conditions. Heal Q. 2016/01/01 ed. 2015;18(3):34–42.
56. Wensing M, Oxman A, Baker R, Godycki-Cwirko M, Flottorp S, Szecsenyi J, et al. Tailored Implementation For Chronic Diseases (TICD): a project protocol. Implement Sci IS. 2011;6:103.
57. Bell B, Black G, Butts J, Goel V, Lafontaine A, Lee V et al. How to accelerate people-centred reform now [Internet]. Public Policy Forum; [cited 2023 Mar 10] p. 20. (Taking Back Health Care). Available from: https://ppforum.ca/wp-content/uploads/2023/01/TakingBackHealthcare-Jan2023-PPF-EN-1.pdf.
58. Province of Nova Scotia. Action for Health: A Strategic Plan 2022–2026 [Internet]. 2022 [cited 2023 Jan 30]. Available from: https://novascotia.ca/actionforhealth/assets/docs/action-for-health-strategic-plan-for-nova-scotia.pdf.
59. Nova Scotia Health. Nova Scotians on the Need a Family Practice Registry - June 2023 [Internet]. [cited 2023 Jun 27]. Available from: https://public.tableau.com/app/profile/nova.scotia.health/viz/ActionforHealth-PublicReporting/Overview.

Tables

Table 1: Demographic characteristics of survey respondents

	Respondents (N = 117)
	N (%)
Respondent profession RN/FPN/LPN NP GP Admin Assistant Clinic Manager Social Worker Dietitian Other	26 (22.2) 16 (13.7) 34 (29.1) 21 (17.9) 4 (3.4) 5 (4.3) 4 (3.4) 7 (6.0)
# years in Practice <1 1–5 6–10 11–15 16–20 >20	4 (3.4) 37 (31.6) 22 (18.8) 21 (17.9) 10 (8.5) 22 (18.8)
# years on IPCT <1 1–5 6–10 11–15 16–20	12 (10.3) 82 (70.1) 9 (7.7) 9 (7.7) 2 (1.7)
# years IPCT in existence <1 1–5 6–10 11–15 16–20 >20	3 (2.6) 61 (52.1) 23 (19.7) 16 (13.7) 7 (6.0) 5 (4.3)
Other roles on team reported by respondents RN FPN LPN NP GP Admin. Assistant Clinic Manager Social Worker Psychologist Physiotherapist Occupational therapist Dietitian Other+	66 (56.4) 56 (47.9) 20 (17.1) 82 (70.1) 99 (84.6) 88 (75.2) 64 (54.7) 41 (35.0) 4 (3.4) 7 (6.0) 2 (1.7) 39 (33.3) 26 (22.2)

*NP = Nurse Practitioner, FPN = Family Practice Nurse, GP = General/Family Physician; #Other included Health Services Lead/Manager, Pharmacist, Podiatrist. *% is expressed out of the total sample size, as not all respondents completed demographic questions; +Other included psychiatrist, urologist, pharmacist, podiatrist, specialist, addiction.

	Respondents (N = 117)
Governance Model Unsure Contracted Services Co-leadership Turn-key	44 (37.6) 24 (20.5) 38 (32.5) 10 (8.5)
Zone Central Western Eastern Northern	57 (48.7) 20 (17.1) 24 (20.5) 15 (12.8)
*NP = Nurse Practitioner, FPN = Family Practice Nurse, GP = General/Family Physician; #Other included Health Services Lead/Manager, Pharmacist, Podiatrist. *% is expressed out of the total sample size, as not all respondents completed demographic questions; +Other included psychiatrist, urologist, pharmacist, podiatrist, specialist, addiction.	

Table 2: Barriers and enablers with associated rank

Category Legend
Coordination & Decision-making
Team Culture and Climate
Communication & Information Sharing
Leadership
Organizational Structure and Design
Technological Tools
Scope of Practice
Education & Training

Statement #	Enablers	N (%)	Rank	Statement #	Barriers	N (%)	Rank
16	All members of the team have access to the technological tools needed to complete their role.	80 (68.4)	1	8	There are not enough opportunities for team members to communicate about *daily events or issues that arise* (e.g., daily clinic huddles or impromptu scheduled meetings to discuss a concern).	36 (30.8)	1
15	There are standardized processes and procedures for using the technological tools (e.g., electronic medical records (EMRs)) available to the team.	79 (67.5)	2	6	There are a lack of processes and procedures in place to facilitate conflict resolution between team members who have different roles.	29 (24.8)	2
13	There is a team/office manager or lead embedded within the team to coordinate team activities (e.g., schedules meetings, organizes staffing) and provides organizational support.	76 (65.0)	3	20	There are a lack of interprofessional education and/or training opportunities for team members to build capacity in delivering collaborative care.	32 (27.4)	3
3	A clear vision is established that fosters a shared sense of purpose and belonging within the team.	67 (57.3)	4	4	The team has not collectively identified well-defined goals regarding how care should be delivered.	25 (21.4)	4
7	Team members are formally or informally recognized by other team members for their performance.	68 (58.1)	5	18	The clinical or direct manager/leads(s) do not understand or operationalize care delivery to facilitate team members working to their full scope of practice.	17 (14.5)	5
11	There are designated leaders within the team who are responsible for	71 (60.7)	6	17	There are a lack of specific strategies in place that allow	17 (14.5)	6

	managing and facilitating collaboration.			providers to practice to their full scope within the team context.		
1	Clear operating procedures are in place that support agreement and coordination with approaches to care (e.g., how to refer patients between providers).	68 (58.1)	7	9	Open, face-to-face or virtual communication is not encouraged through regularly scheduled team meetings.	20 (17.1)	7
12	Individuals in leadership roles foster and facilitate an environment of trust and respect.	63 (53.8)	8	3	There is no clear vision established, impeding a shared sense of purpose and belonging within the team.	18 (15.4)	8
9	Open, face-to-face or virtual communication is encouraged through regularly scheduled team meetings.	63 (53.8)	9	12	Individuals in leadership roles do not foster and facilitate an environment of trust and respect.	15 (12.8)	9
14	Workspaces are designed to encourage collaboration (e.g., shared clinical space, meeting rooms, lunch rooms).	65 (55.6)	10	19	There are not clear mechanisms in place to ensure providers can articulate their own and other team members' respective scopes of practice.	17 (14.5)	10
10	Communication tools or protocols are in place and designed well for facilitating collaborative care (e.g., encourage information sharing within the team).	64 (54.7)	11	10	Communication tools or protocols are either not in place or are in place but are not designed well for facilitating collaborative care (e.g., deter information sharing within the team).	17 (14.5)	11
17	There are specific strategies in place that allow providers to practice to their full scope within the team context.	62 (53.0)	12	14	Workspaces are not designed to encourage collaboration (e.g., shared clinical space, meeting rooms, lunch rooms).	18 (15.4)	12
2	The process for non-clinical decision-making is	62 (53.0)	13	21	Individuals in leadership roles	15 (12.8)	13

	not dominated by one individual (e.g., enable both top-down and bottom-up decision making).			lack the interprofessional education and training necessary to become champions of collaborative care.		
5	There is an organizational culture that encourages the entire team to take responsibility for the outcomes of care delivery (both good and bad).	56 (47.9)	14	5 There is an organizational culture that discourages the full team from taking responsibility for the outcomes of care delivery (both good and bad).	14 (12.0)	14
18	The clinical or direct manager/leads(s) understand and operationalize care delivery to facilitate team members working to their full scope of practice.	57 (48.7)	15	2 The process for non-clinical decision-making is dominated by one individual or profession (e.g., rigid hierarchical control over decisions).	16 (13.7)	15
19	There are clear mechanisms in place to ensure providers can articulate their own and other team members' respective scopes of practice.	61 (52.1)	16	1 Clear operating procedures are not in place, fostering disagreement over approaches to care (e.g., how to refer patients between providers).	14 (12.0)	16
4	The team has collectively identified well-defined goals regarding how care should be delivered. .	56 (47.9)	17	16 Not all members of the team have access to the technological tools needed to complete their role.	11 (9.4)	17
8	There are enough opportunities for team members to communicate about *daily events or issues that arise* (e.g., daily clinic huddles or impromptu scheduled meetings to discuss a concern).	52 (44.4)	18	11 There are no designated leaders within the team responsible for managing and facilitating collaboration.	13 (11.1)	18
20	There are interprofessional education and/or training opportunities for team members to build capacity	48 (41.0)	19	7 Team members are not formally or informally recognized by other	15 (12.8)	19

	in delivering collaborative care.				team members for their performance.		
21	Individuals in leadership roles have the interprofessional education and training necessary to become champions of collaborative care.	47 (40.2)	20	13	There is no team/office manager or lead embedded within the team to coordinate team activities (e.g., schedule meetings, organize staffing) and provide organizational support.	10 (8.5)	20
6	There are processes and procedures in place to facilitate conflict resolution between team members who have different roles.	29 (24.8)	21	15	There are no standardized processes and procedures for using the technological tools (e.g., EMRs) available to the team.	7 (6.0)	21

Table 3
Comparison of ranking across participant roles

	Enablers (rank)				Barriers (rank)			
Statement #	**Nurses**	**GPs**	**Admin/ Manager**	**Other**	**Nurses**	**GPs**	**Admin/ Manager**	**Other**
1	4	13	6	9	15	16	14	9
2	9	18	16	6	20	17	7	16
3	7	10	4	8	14	9	3	11
4	17	17	9	11	4	3	4	6
5	20	12	15	16	16	8	11	14
6	21	21	20	21	3	1	1	5
7	5	7	5	12	18	19	10	12
8	19	5	18	20	1	2	2	1
9	8	8	14	15	10	11	12	4
10	10	14	8	10	12	5	13	8
11	6	9	11	2	17	12	16	15
12	11	6	19	1	9	13	5	19
13	3	3	10	4	21	14	6	7
14	18	4	2	17	6	20	21	10
15	1	2	3	7	19	21	18	18
16	2	1	1	3	11	15	17	20
17	14	11	12	5	7	10	15	13
18	12	16	13	13	5	18	8	17
19	13	15	7	19	13	4	19	3
20	15	19	21	18	2	6	9	2
21	16	20	17	14	8	7	20	21

Table 4
Qualitative analysis of open-ended survey responses

Theme	Description	Sample quote
Leadership (n = 4)	Differences in levels of competency and involvement by co-leaders can be a barrier to collaboration.	In the co-leadership model, there is a clinical lead and an organizational lead. Some of the enablers are grounded by a strong clinical lead despite having poor organizational leadership. Several of the barriers are impacted by poor organizational leadership that is not outweighed by good clinical leadership. For example, barriers around scope of practice are primarily influenced by organizational leadership while enablers about fostering trust and respect are driven almost exclusively by clinical leadership. (Nurse)
Funding model (n = 3)	The Fee for Service (FFS) funding model was identified as a barrier to collaborative practice as it creates a disincentive for physicians to collaborate as they lose revenue.	Barriers include the fee for service model within a collaborative practice. Physicians are 'scared' to give up their patient care as they won't be able to bill for some visits. (Nurse)
Built Environment (n = 2)	The workspace was both a facilitator and a barrier to collaborative practice.	Enabler: shared team lounge/lunchroom - allows for informal collaboration and team building. (GP) Having a bigger working area would be beneficial as we run out of space often. Organization around office is key and run is limited. (Admin)

Table 5

Participants demographics

	Participants (N = 33) n (%)
Role	
Family Physician	4 (12)
Nurse Practitioner	4 (12)
Registered Nurse and/or Family Practice Nurse	2 (6)
Clinic Manager / Administrators	2 (6)
Health Service Managers/Leads	6 (18)
Patient and/or caregiver attached to a CFPT	5 (15)
Other	10 (30)
Nova Scotia Health Management Zones	
Central	7 (21)
Northern	7 (21)
Eastern	0 (0)
Western	19 (58)

Table 6

Evaluation survey responses

	Survey Respondents n (%)
Role (n = 18)	
Family Physician	2 (11)
Nurse Practitioner	4 (22)
Registered Nurse and/or Family Practice Nurse	0
Clinic Manager / Administrators	2 (11)
Health Service Managers/Leads	2 (11)
Patient and/or caregiver attached to a CFPT	4 (22)
Other	4 (22)
Opportunities for dialogue	
Have a greater understanding of barriers/enablers to implementation (n = 18)	
Agree	15 (83)
Neutral	2 (11)
Disagree	1 (6)
Heard perspectives they may not have otherwise heard (n = 17)	
Agree	14 (82)
Neutral	3 (18)
Disagree	0 (0)
Strategy co-creation	
Engaged with others to brainstorm potential strategies (n = 17)	
Agree	13(76)
Neutral	4(24)
Disagree	0(0)
Event was an effective way to support brainstorming strategies (n = 17)	
Agree	12(71)
Neutral	5(29)

	Survey Respondents n (%)
Role (n = 18)	
Disagree	0(0)
Application	
How likely are you apply any of the recommendations identified through this event (n = 13)	
Likely	9 (69)
Neutral	4 (31)
Unlikely	0 (0)
Do you feel the strategies identified have the potential to improve patient care (n = 3)	
Likely	3 (75)
Neutral	0 (0)
Unlikely	0 (0)

Table 7: Summary of implementation strategies and associated actions

Implementation Strategy	Description	Associated Actions
Optimize scope of practice to balance patient care and provider needs	This strategy supports team members to work flexibly within their scope of practice, balancing the needs and interests of the provider when assigning patient services. This approach was seen as favourable to always working to full scope of practice, which could concentrate challenging cases with physicians and nurse practitioners, and contribute to staff burnout. Balancing patients appointments amongst various staff roles was also seen to build trust between patients and the whole team, prior to the onset of serious health concerns, and helps familiarize patients on the role of different clinic staff and how their functions overlap.	• Allow providers to be flexible in working to full scope of practice (balance provider workload and reduce burnout). • Build positive rapport and trust between the patients and the whole team. • Include Patient and Family Advisors (PFAs) and patients as stakeholders to the practice. • Provide education within the clinic and to the public about team members and their respective roles, abilities, and scopes of practice. • Balance the abilities and interests of team members so patients can be scheduled to an appropriate provider (may increase access to care). • Incorporate technology and software that makes patient files accessible to all team members (may facilitate care

Implementation Strategy	Description	Associated Actions
		and case conference).
Holding regular and accessible meetings	This strategy highlights the importance of using meetings as a medium of communication and support for all staff within the practice. Different formats and frequencies can be used strategically to support practice goals and activities.	• Be respectful of members' time during meetings (have an agenda, meeting goal(s), keep to time). • Use meetings to communicate practice needs and share feedback, and discuss barriers experienced by team members and the community. • Include all members of the practice in team meetings for transparency, to facilitate collaboration, understand patient needs, and provider scope (e.g., administrative staff). • Choose a consistent virtual communication software for ease of use (e.g., Zoom, Skype, Teams). • Use meeting strategically to support various practice goals and activities (e.g., roundtables, meetings with other community providers,

Implementation Strategy	Description	Associated Actions
		patient case-conferences). • Establish protected time for team meetings.
Support team development opportunities	This strategy focuses on facilitating and improving teamwork within the practice.	• Model collaboration behaviour for other team members. • Support team members in working together rather than independently. • Ensure team members know that they're appreciated (e.g., rewarding good work) and share success stories to boost morale. • Educate team members on governance models and how they affect teamwork (e.g., union requirements, different contractual obligations). • Discuss collaborative strategies experiences by team members in other settings (e.g., in school) and how they can be included in the practice. • Allot recurring time to discuss practice goals, quality standards, and revisit the

Implementation Strategy	Description	Associated Actions
		memorandum of agreement. • Provide a medium for anonymous feedback by team members and patients. • Create a leadership role responsible for collaboration and effective teamwork. • Design physical spaces to facilitate and encourage teamwork.
Support professional development opportunities	This strategy focuses on additional training for individual team members and how it can benefit the practice as well as practitioners.	• Encourage and support mentorship within the practice, allowing members to share skills and grow their scope of practice. • Provide and support opportunities for team members to build skills through educational opportunities. • Consider practice composition when hiring new staff (e.g., mentoring opportunities).

Implementation Strategy	Description	Associated Actions
Support involvement in non-clinical activities	This strategy captures the challenges with billing and compensation experienced by team members who use a "fee for service" model, which makes it difficult for members to bill for professional time not spent on direct patient care.	• Use the funding available for collaborative activities and, when possible, have administrative staff complete the Family Physician Collaboration Payment Form. • Create payment mechanisms that compensate all team members for collaborative activities including attending regular meetings, without the need for additional billing requests.

Figures

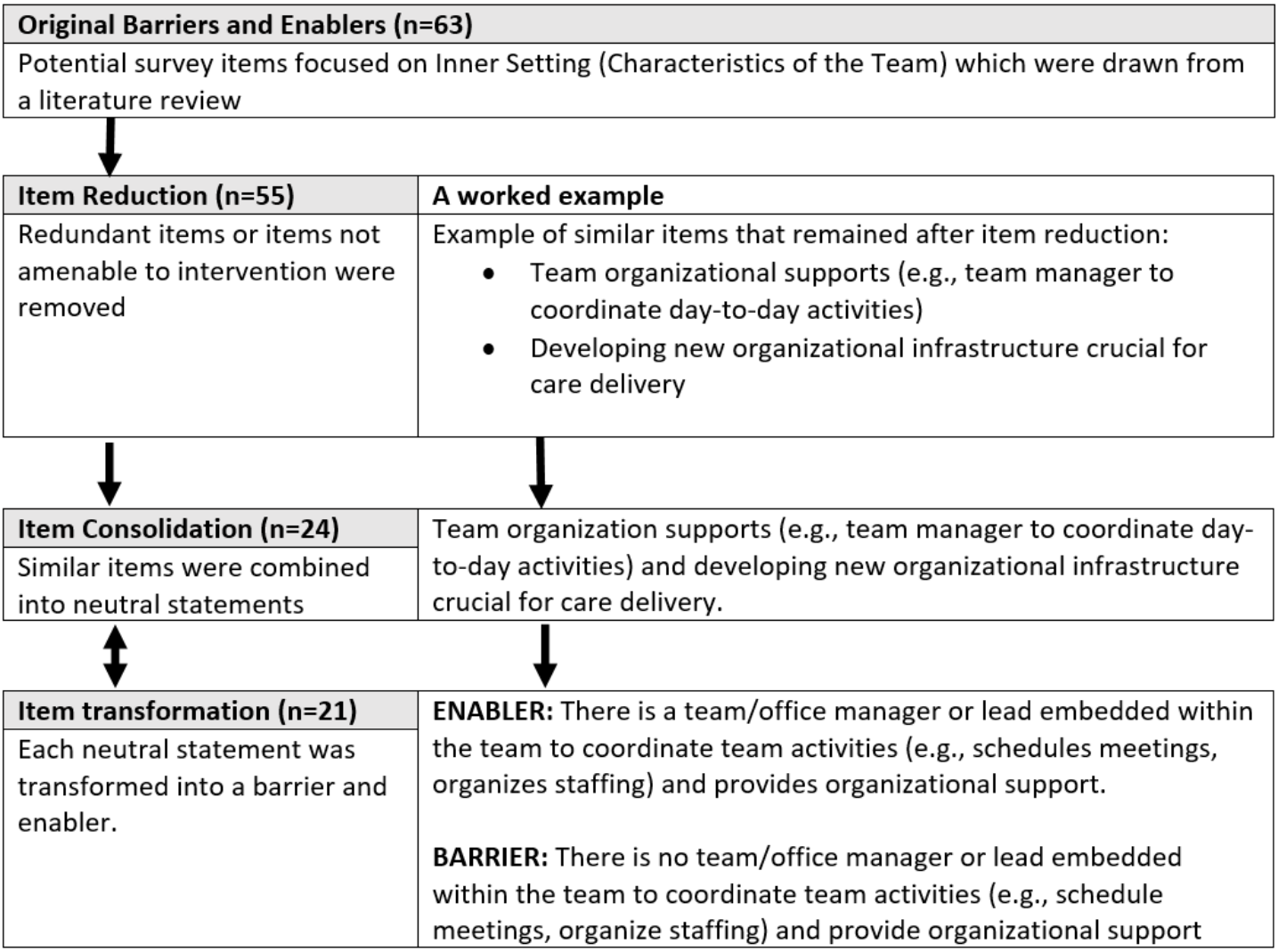

Figure 1

Survey item reduction and development process with a worked example

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- AppendicesIPCT.docx