Assessing Organizational Participatory Research Partnerships in Health:

A Content Validation Study

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LIST OF ACRONYMS

CBPR: Community-based participatory research

CIHR: The Canadian Institutes of Health Research

CIROP: The Community Impacts of Research Oriented Partnerships

CIROP RF: The Community Impacts of Research Oriented Partnerships respondent form

iKT: Integrated knowledge translation

OPR: Organizational participatory research

OPREM: The Organizational Participatory Research Evaluation Method

PIQ: The Partnership Indicators Questionnaire

PSS: The Partnership Strength Survey

SHRTN CoP: The Seniors Health Research Transfer Network Community of Practice

ABSTRACT

Context

Organizational Participatory Research (OPR) is a research approach, which sees researchers partnering with members from health organizations, e.g., clinicians and health managers, to improve organization practice (organizational learning). It is thought that better OPR partnership processes lead to more OPR extra-benefits, i.e., positive outcomes outside the anticipated types of change. Although partnership evaluation can be used to maximize OPR partnership processes, little evaluation has been reported in the OPR literature. To address this gap, a systematic review identified six OPR partnership evaluation tools which were used to produce concepts and dimensions of OPR partnerships and an evaluation questionnaire (OPREM V2). These review products, however, may be enhanced in three ways. First, the relationships among the concepts and dimensions of OPR partnerships have not been explained or predicted. Doing so, would establish a theoretical base that would improve the validity of OPR partnership assessment. Second, V2 has not been content validated with experts. Third, V2 has not been content validated with users, i.e., OPR stakeholders who would use the questionnaire. Validation with experts and users is important to ensure that a questionnaire is relevant and representative of the phenomenon to be measured, i.e., OPR partnership.

Objectives

The overarching goal of this research is to produce a questionnaire for the evaluation of OPR partnerships, which is theory-informed and has been validated with experts and users.

Thus, the specific objectives of this research are to:

(O1) Predict and explain relationships among the concepts and dimensions of OPR partnerships to produce a theory to act as the conceptual base of further OPREM development.

(O2) Validate the OPREM V2 with experts to produce an OPREM version three (V3).

(O3) Validate the OPREM V3 with users to produce an OPREM version four (V4).

Design

This dissertation research followed a three phase content validation design: theory building (phase 1) and a two-phase mixed methods study (phases 2, e-Delphi, and 3, cognitive and usability testing).

Phase 1 (O1) [Theory building]: Relationships among concepts and dimensions of OPR partnerships were explained and predicted using theory building guidance, to form an OPR partnership theory. This theory formed the conceptual underpinning of the OPREM development.

Phase 2 (O2) [Quantitative component, e-Delphi]: international OPR experts built consensus on V2 items. OPR experts assessed the relevance and clarity of V2 items. Given that experts assessed all items as relevant or very relevant, clarity ratings were used to retain items as is, modify and retain items, or remove items. OPR experts also had the opportunity to comment on their answers, suggest modifications or compose new items (if any), thus improving the representativeness of items. The final list of items was used to produce an OPREM V3, which was evaluated in the next phase.

Phase 3 (O3) [Qualitative component, cognitive and usability testing]: OPR stakeholders from primary health care contexts took part in cognitive interviews and were asked about their perceptions of OPREM V3 items for their context. They were also asked to speak about the usability of the OPREM V3 for their context. Users from primary health care were chosen because I am a PhD student in Family Medicine & Primary Care, and my dissertation is expected to impact primary health care research and practice. The final list of items was used to produce an OPREM V4.

Conclusion

The OPREM V4 will be disseminated across Canada and internationally so OPR stakeholders can use evaluation findings to optimize their OPR partnerships, thus helping to improve the practices of primary health care organizations.

RÉSUMÉ

Contexte

La recherche participative organisationnelle (RPO) est une approche de recherche dans laquelle les chercheurs travaillent en partenariat avec des membres des organisations de santé, par exemple des cliniciens et des gestionnaires, afin d'améliorer les pratiques de l'organisation (apprentissage organisationnel). De meilleurs processus de partenariat dans le cadre de la RPO conduiraient à des avantages supplémentaires, c'est-à-dire à des résultats positifs en dehors des types de changement prévus. Bien que l'évaluation des partenariats puisse être utilisée pour maximiser les processus de partenariat, peu d'évaluations ont été rapportées dans la littérature sur le RPO. Pour combler cette lacune, une revue systématique a identifié six outils d'évaluation des partenariats de RPO qui ont été utilisés pour produire des concepts et des dimensions des partenariats de RPO ainsi qu'un questionnaire d'évaluation (OPREM V2). Ces produits peuvent toutefois être améliorés. Premièrement, les relations entre les concepts et les dimensions des partenariats de RPO n'ont pas été expliquées ou prédites. Cela permettrait d'établir une base théorique pour améliorer la validité de l'évaluation des partenariats de RPO. Deuxièmement, le contenu de l'OPREM V2 n'a pas été validé par des experts. Troisièmement, le contenu n'a pas été validé auprès d'utilisateurs, c'est-à-dire des parties prenantes de RPO qui utiliseraient le questionnaire. La validation auprès d'experts et d'utilisateurs permet d'améliorer la pertinence d'un questionnaire et de s'assurer qu'il mesure bien le construit d'intérêt, soit le partenariat en RPO.

Objectifs

L'objectif global de cette recherche est de produire un questionnaire pour l'évaluation des partenariats de RPO, qui soit fondé sur la théorie et qui ait été validé par des experts et des utilisateurs.

Les objectifs spécifiques de cette recherche sont les suivants :

(O1) Prédire et expliquer les relations entre les concepts et les dimensions des partenariats de RPO afin de produire une théorie qui servira de base conceptuelle au développement subséquent de l'OPREM.

(O2) Valider l'OPREM V2 avec des experts pour produire une troisième version de l'OPREM (V3).

(O3) Valider l'OPREM V3 auprès d'utilisateurs pour produire une quatrième version de l'OPREM (V4).

Devis de l'étude

Il s'agit d'une étude de validation de contenu en trois phases : élaboration de la théorie (phase 1) et une étude utilisant une méthode mixte (phases 2, e-Delphi, et 3, tests cognitifs et d'utilisabilité).

Phase 1 (O1) [Élaboration de la théorie] : Les relations entre les concepts et les dimensions des partenariats de RPO ont été expliquées et prédites à l'aide de guides sur l'élaboration de théories,

pour développer une théorie des partenariats de RPO. Cette théorie a constitué le fondement conceptuel de l'élaboration des versions subséquentes de l'OPREM.

Phase 2 (O2) [Composante quantitative, e-Delphi] : des experts internationaux de RPO ont établi un consensus sur les items de la V2. Les experts ont évalué la pertinence et la clarté des items. Étant donné que les experts ont jugé tous les items pertinents ou très pertinents, les évaluations de la clarté ont été utilisées pour conserver les items tels quels, les modifier et les conserver, ou les supprimer. Les experts ont également eu la possibilité de commenter leurs réponses, de suggérer des modifications ou de composer de nouveaux items, ce qui a permis d'améliorer la représentativité des items. La liste finale des items a été utilisée pour produire un OPREM V3, qui a été évalué dans la phase suivante.

Phase 3 (O3) [Composante qualitative, tests cognitifs et d'utilisabilité] : Les parties prenantes de RPO dans le contexte de soins de santé primaires ont pris part à des entretiens cognitifs et ont été interrogées sur leurs perceptions des items de l'OPREM V3 dans leur contexte et de son utilisabilité. Les utilisateurs des soins de santé primaires ont été choisis parce que je suis doctorant en médecine familiale et en soins primaires. Donc, ma thèse devrait avoir un impact sur la recherche et la pratique des soins de santé primaires. La liste finale des items a été utilisée pour produire une OPREM V4.

Conclusion

L'OPREM V4 sera diffusé au Canada et à l'étranger afin que les parties prenantes de RPO puissent utiliser les résultats de l'évaluation pour optimiser leurs partenariats de RPO, contribuant ainsi à améliorer les pratiques des organisations des soins de santé primaires.

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I would like to thank Dr Pierre Pluye, for his immense dedication as my primary supervisor. His drive, orientation to detail, critical thinking skills, and passion for inquiry have inspired me. His empathy, attentiveness, and generosity have been much appreciated. He has helped me grow academically, professionally, and personally. I remain forever grateful for all the wisdom that Pierre has imparted on me, for all his help to advancing my PhD research, and, most importantly, for giving me the amazing opportunity to be his graduate student. Rest in peace, dear Pierre.

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those I was able to confide in and learn from. I am also grateful for the Graphos team at McGill and their wonderful ‘three months to advance your thesis’ program. It was a gift to be part of this writing community – the discussions, lessons learned, and mutual support that this group offered was indispensable.

Finally, I thank God, for guiding and keeping me steady on my path to a PhD.

CONTRIBUTIONS TO ORIGINAL KNOWLEDGE

This dissertation research provides theoretical, empirical, and practical contributions. First, an innovative OPR partnership theory is produced. Second, validated tools that evaluate OPR partnerships, and that are based on the theory, are produced (OPREMs V3 and V4). Third, the OPREM V4 can be used to assess and improve OPR partnerships, which are important to foster organizational practice improvement.

CONTRIBUTIONS OF AUTHORS

I am the first author on all sections of this thesis. Authors' contributions for the scholarly work that answered the research questions, can be found within each of the three manuscripts. Below, I describe the relative contributions for other sections that pertain to the dissertation:

Introduction and Background

I am the author of this section. Drs. Pierre Pluye and Catherine Hudon reviewed the text.

Methodology

I am the author of this section. Dr. Catherine Hudon reviewed the text.

Bridges to manuscripts

I am the author of these sections. Dr. Catherine Hudon reviewed the texts.

Discussion

I am the author of this section. Dr. Catherine Hudon reviewed the text.

Conclusion

I am the author of this section. Dr. Catherine Hudon reviewed the text.

CHAPTER 1 INTRODUCTION

In Organizational Participatory Research (OPR), academic researchers (from an organization or university) work with non-academic organization members (e.g., patients, clinicians, and health managers and policymakers) to stimulate organizational learning and practice innovation (Argyris et al., 1985; Waterman et al., 2001). While the expected outcome of OPR is practice improvement, OPR has also been shown to manifest outcomes outside what is usually planned or expected (Bush, Pluye, et al., 2017). In other words, OPR processes including partnership processes, e.g., establishing an OPR steering committee, lead to benefits that are not linked to the objectives of the OPR – extra-benefits – e.g., extension of OPR into other organizations or new professional skills (Bush, Pluye, et al., 2018). Although evaluation of an OPR partnership can pinpoint areas of improvement within the partnership (Bowen et al., 2022), and thus optimize the benefits of OPR, there is little partnership evaluation reported within the OPR literature. OPR, and other issues described in this paragraph (e.g., benefits, OPR partnership evaluation), will be unpacked further on in the background.

To address this gap in OPR partnership evaluation, I performed a systematic mixed studies review of OPR partnership evaluation questionnaires for my MSc thesis (Hamzeh et al., 2019). Based on the systematic review steps, six OPR partnership evaluation questionnaires were included: (a) The Community Impacts of Research Oriented Partnerships (CIROP) (King et al., 2009); (b) The CIROP respondent form (RF) (King et al., 2009); (c) The Partnership Indicators Questionnaire (PIQ) (Kothari et al., 2011); (d) The Partnership Strength Survey (PSS) (Savitz, 2007); (e) The Canadian Institutes of Health Research (CIHR) researcher-knowledge user integrated knowledge translation (iKT) survey (Tetroe, 2011); and (f) The Seniors Health

Research Transfer Network (SHRTN) Community of Practice (CoP) Evaluation Tool (Lusk & Harris, 2010). The items from these evaluation questionnaires were grouped into concepts and dimensions to evaluate OPR partnerships. The items were also used to produce a questionnaire that assesses the OPR partnership concepts and dimensions, named the OPR evaluation method (OPREM) version two (V2) (Hamzeh et al., 2018; Hamzeh et al., 2019). However, several gaps remained within these review outputs, to be addressed within my PhD research:

- The relationships between OPR partnership concepts were not nuanced (GAP 1). Therefore, I developed an OPR partnership theory that explains and predicts the relationships between the OPR partnership concepts (MANUSCRIPT 1). This theory will allow evaluators to assess OPR partnerships at any point during the OPR lifecycle, and therefore track OPR partnership improvement (CONTRIBUTION 1).
- The OPREM V2 has not been content validated with experts (GAP 2). Therefore, I developed an OPREM that is content validated with experts from around the world, named the OPREM version three (V3) (MANUSCRIPT 2). This validated OPREM V3 serves as an intermediary version during OPREM development (CONTRIBUTION 2).
- The OPREM V2 has not been content validated with users (GAP 3). Therefore, I validated the OPREM V3 with users from primary health care (as a PhD student in Family Medicine and Primary Care, I aim to align my dissertation with the advancement of primary health care research and practice) (MANUSCRIPT 3). This led to an OPREM version four (V4). An OPREM validated with users from primary health care will be useful to evaluate and improve OPR partnerships within organizations using OPR for primary health care improvement (CONTRIBUTION 3).

Research Objective and Questions

The overarching goal of this research is to produce a questionnaire for the evaluation of OPR partnerships, which is theory-informed and has been validated with experts and users.

Thus, the specific objectives of this research are to:

(O1) Predict and explain relationships among the concepts and dimensions of OPR partnerships to produce a theory to act as the conceptual base of further OPREM development.

(O2) Validate the OPREM V2 with experts to produce an OPREM version three (V3).

(O3) Validate the OPREM V3 with users to produce an OPREM version four (V4).

To address these objectives, the specific research questions are:

Q1(O1): What are the relationships between the concepts and dimensions of OPR partnerships?

Q2(O2): What are the most relevant and representative OPREM items as determined by experts?

Q3(O3): What are users' perceptions regarding an OPREM constructed from these items?

CHAPTER 2 BACKGROUND

The following background introduces concepts informing the central concept of this dissertation, OPR (Figure 1.). First, participatory research, is defined and the main features and varieties of participatory research are described. Second, the research partnerships inherent within participatory research are defined, and their main features are described. Third, one type of participatory research, organizational participatory research (OPR), is defined, followed by an examination of research partnerships within OPR, i.e., OPR partnerships. That is, OPR partnerships are defined, and their main features and historical roots are described, as well as the importance of evaluating OPR partnerships. Finally, the research gap addressed by this thesis will be presented.

Figure 1. Main concepts informing organizational participatory research (OPR) partnerships

Participatory Research

Participatory research has been defined as the "systematic inquiry, with the collaboration of those affected by the issue being studied, for purposes of education and taking action or effecting social change" (Green et al., 1995, p. 4). Similarly, according to the International Collaboration for Participatory Health Research (2013), "for [participatory health research], the primary underlying assumption is that participation on the part of those whose lives or work is the subject of the study fundamentally affects all aspects of the research" (p. 5).

Participatory research is rooted in Southern and Northern traditions. Knowledge syntheses of participatory research approaches within these traditions are described in Appendix 1. In the Southern tradition, the focus is on community empowerment. In Pedagogy of the Oppressed, Freire (1968/2018), a Brazilian, argues that one must work with the disempowered, to emancipate them. In the Northern tradition, the focus is on broad organizational improvement. One approach in this tradition of participatory research is action research. Seminal work from Lewin (1946), a German-American, defined action research as inquiry conducted with organizational professionals with the aim of producing social improvements. Seminal work from Argyris et al. (1985), another American, followed a similar vein, defining action science as inquiry performed with organization members, yet with the aim of changing how organization members think and behave, to stimulate organizational improvement.

Recent trends show that North America and continents with similar social and healthcare systems, e.g., Europe and Australia, are oriented to the Northern tradition of participatory research. Indeed, in their review, Cordeiro and Soares (2018) found that of the 57 included action research studies aimed at healthcare improvement, 23 were performed in Europe, 11 in North

America, and 8 in Australia. In contrast, of the 28 included action research studies aimed at community health improvement, 1 was performed in Europe, 6 in North America, and 3 in Australia.

In participatory research, there is a research partnership, also called research coproduction partnerships, where stakeholders from practice and academic settings work together to conduct inquiry (Bonny, 2017; Hoekstra et al., 2018; Kothari et al., 2022). Research partnerships are defined in the following section.

Research Partnerships

Hoekstra et al. (2018) provide a definition of research partnerships:

> Individuals, groups, or organizations engaged in collaborative research activity involving at least one researcher (e.g., individual affiliated with an academic institution) and any stakeholder actively engaged in any part of the research process (e.g., decision or policy maker, health care administrator or leader, community agency, charities, network, patients etc. (p. 4)

Similarly, Bonny (2017) states:

> Nous appelons recherche partenariale les modalités de recherche impliquant une articulation forte avec un milieu de pratique (que la recherche soit conçue *à partir de* ce milieu, dans une perspective d'abord cognitive et réflexive, ou *en vue de* ce milieu, dans une perspective d'appropriation et de traduction des connaissances produites en orientations d'action). (p. 25)

Finally, when speaking about research coproduction, Kothari et al. (2022) state "research coproduction adopts a participatory approach. Team members – researchers and knowledge users – are equal partners with respect to research and dissemination decisions, drawing on everyone's expertise" (p. 4).

The literature related to partnership growth is diverse. Influential work by Arnstein (1969) on levels of citizen participation posits that partnerships are achieved when there is "share[d] planning and decision-making responsibilities through such structures as joint policy boards, planning committees and mechanisms for resolving impasses" (p. 221). In contrast, in their discussion of other types of participatory research, Duran et al. (2013) state that "partnership means spending the time to develop trust and, most important, spending time to develop the structures that support trust, so that unexpected new directions or setbacks can be seen as part of a long-term process that will continue" (p. 47). This partnership literature, however, assumes that shared decision-making power is achievable within partnerships. Heron and Reason (2001) argue that true shared decision-making power is an ideal, i.e., impossible to achieve. The authors appear to clarify what they mean when speaking about empowering stakeholders to be free to contribute towards the research methodology, to express their emotions and to serve as co-governors of the research process. An apparent contradiction surfaces – indeed, how can stakeholders strive to serve as co-governors when it is impossible to achieve? As Heron and Reason (2001) state "what undoubtedly can be achieved as the inquiry proceeds is a sufficient degree of inter-dependent collaborative reflection and management, for the research to be genuinely *with* people, and not about them or on them" (p. 185).

Community-based participatory research (CBPR) is one kind of participatory research and "is a collaborative approach to research that equitably involves, for example, community members, organizational representatives, and researchers in all aspects of the research process" (Israel et al., 1998, p. 177). In contrast, OPR is one kind of participatory research that is aimed at improving organizational practice rooted in organizational learning and action science (Argyris et al., 1985).

Organizational Participatory Research (OPR)

In the following section, the historical roots of OPR, i.e., organizational learning and action science (in management and organization studies), is presented. Second, a definition of OPR, and its benefits and challenges, are presented. Third, the importance of OPR partnership evaluation is described, along with the theoretical and methodological gaps in the OPR partnership evaluation literature.

Organizational learning and Action Science

Important theoretical contributions to the fields of organizational learning and action science are described below.

In 1963, Cyert and March proposed a seminal model on organizational learning. Cyert and March (1963) explain how factors outside organizations stimulate the implementation of bureaucratic features within organizations. The mechanism by which this implementation occurs is organizational learning. For example, an organization may 'learn' that short-term, flexible

contracts are conducive to productivity demands imposed by political forces from outside the organization. The model assumes organizations maintain a core organizational identity.

Cangelosi and Dill (1965) proposed a model which problematizes assumptions from Cyert and March (1963). This model assumes that organizations do not maintain a core identity. This model, therefore, could help explain how primary care clinics restructure into makeshift emergency departments during times of public health crisis (e.g., pandemics). Likewise, Argyris et al. (1985) proposed an approach, called action science, which also problematizes assumptions from Cyert and March (1963). Action science assumes that organization members must choose to change their beliefs and assumptions, in order to improve their practices.

Argyris et al. (1985) argue that "applied researchers can intervene in practical affairs and manipulate causal variables to bring about desired outcomes. But to protect their status as scientists, they must circumvent normative questions and consequently cannot give practitioners much guidance on dilemmas of value" (p. 221).

To address the above, Argyris et al. (1985) summarize the notion of action science by stating "to put it most succinctly, action scientists engage with participants in a collaborative process of critical inquiry into problems of social practice in a learning context" (p. 237). Action science operates on two aims. First, action science aims for new norms within research, e.g., democratic research governance and practice, and empowering organizational staff to voice concerns to organizational leaders. Second, this approach aims to study and modify practitioners' practices and the factors influencing their practices, e.g., organizational policies. Put otherwise, action science assumes that organizational learning occurs through an understanding of multiple levels of a phenomenon (Argyris et al., 1985).

There are several steps within the action science process. First, action science requires that the researcher helps practitioners understand the thinking behind their practices. For example, this could involve researchers working with emergency department clinicians to understand the reasoning behind their triage practices. Second, action science requires that researchers help foster an environment where practitioners can discuss their practice issues. If emergency department clinicians do not feel comfortable discussing weaknesses within traditional triage practices, e.g., long wait times that lead to poor patient outcomes, then it may prove difficult to identify areas of improvement. Third, researchers and practitioners improve their learning, as they test and refine the thinking that informs their practices. Emergency department clinicians, therefore, must be willing to replace their previous reasoning about triage practices, with new reasoning, based on data. Fourth, to sustain their learning, practitioners must continually question and revise the thinking informing their actions. In this sense, being able to evaluate their own thinking becomes an orientation that the emergency department clinicians adopt as part of their daily practice (Argyris et al., 1985).

Indeed, within action science the aim is to stimulate organizational learning through a partnership between academics and organization members. In addition to action science, there are other terms within the literature describing such partnerships, such as academic-service partnerships, action research in health or with health practitioners, multi-stakeholder partnerships, nurse/nurse-led action research, participatory action research with health managers or in healthcare settings, participatory intervention in health and OPR. In this dissertation, the term OPR is used, and in the following section a formal definition of OPR is provided, along with a description of OPR benefits and challenges.

Defining OPR partnerships and their benefits and challenges

OPR is an innovative integrated knowledge translation strategy used to infuse the 'voices' of organization members (e.g., clinicians, health managers and policymakers) within research focused on improving the practices of organizations (Argyris et al., 1985; Waterman et al., 2001). According to Bowen et al. (2022), an OPR partnership can occur with at least one academic researcher and one organization member, or one academic organization and one health organization. Further, an OPR partnership can be initiated by the health or academic organization, or funding agency (Bowen et al., 2022). Moreover, within OPR partnerships, researchers can work within the health organization (Wolfenden et al., 2017). In any OPR partnership, the academics and non-academics involved have a shared interest (or stake) in OPR (knowledge production and utilization, respectively); together, these actors are considered OPR stakeholders.

There are several benefits of adopting an OPR partnership approach. First, involving healthcare practitioners in research may lead to them developing new knowledge, attitudes, and practices (Boaz et al., 2015). Moreover, academic service partnerships can foster the involvement of service users, e.g., patients, in service improvement. These partnerships can also foster the integration of competencies, and the democratization of research governance, among partnership members (De Geest et al., 2013). In addition, there are several outcomes produced from integrated knowledge translation, e.g., OPR, including improving the relevance of the research objectives and methods, dissemination and application of evidence, expansion of research partnerships from one project to another, research ownership, and conflict resolution (Lawrence et al., 2019). These and other OPR partnership elements are detailed within Appendix 2.

There are also benefits that are outside the OPR purview, i.e., extra benefits. Examples of such benefits include clinicians learning how to work better together, more democratic decision-making within organizations (i.e., clinicians are invited by decision-makers to share their thoughts on policy), or a new desire by clinicians to become abreast of the latest research in their practice domain (Bush, Pluye, et al., 2017).

Although there are benefits and extra-benefits to OPR, it is not without its challenges (see Table 1).

Table 1. Challenges within OPR partnerships

Challenge	**Reference**
Study does not represent interests of the academic and health organizations	Bowen et al. (2022)
Study progresses slowly	Bowen et al. (2022)
Partnership members are not committed to work in partnership	Bowen et al. (2022)
Time invested is insufficient	Bornstein et al. (2017); Bowen et al. (2022); Bush, Haggerty, et al. (2018); Lehmann and Gilson (2015)
Partnership is not assessed	Bowen et al. (2022)
Research questions lack focus	Bornstein et al. (2017)
Organization shifts in form and function, e.g., organizational missions	Bush, Haggerty, et al. (2018)
Communication among partnership members is problematic, e.g., researchers use academic terms	Bush, Haggerty, et al. (2018)
Partnership members have different preferences, e.g., organization members may not want to be involved in methodological decisions	Bush, Haggerty, et al. (2018)
Organization members are terminated from the organization	Bush, Haggerty, et al. (2018)
Partnership members lack a unified understanding of the partnership purpose	Wehrens et al. (2010)

Research findings may not be contextually appropriate	Lehmann and Gilson (2015)

An improved understanding of how OPR partnerships operate may be helpful to mitigate challenges. There is work within the domain of research partnerships that target 'theorizing', otherwise known as the process of constructing a theory, i.e., defining the main concepts of research partnerships and proposing relationships between the concepts (Silver, 2019). Theorizing is useful to assess and improve research partnerships. MacFarlane and Salsberg (2022) argue that it is worthwhile to clarify the components of research coproduction partnerships, e.g., OPR. Doing so, is key to capture lessons from previous research coproduction partnerships, and to design successful future partnerships.

Theorizing within research partnerships

The following section overviews theorizing within research partnerships.

Hoekstra et al. (2020) performed a review of reviews that identified principles, strategies, outcomes and impacts of research partnerships. They identified and sorted research partnership principles and strategies into the following concepts: (a) relationship between partners; (b) knowledge co-production; (c) meaningful stakeholder engagement; (d) capacity-building, support, and resources; (e) communication between partners; (f) ethical issues; (g) stakeholder engagement in the planning, conducting, and dissemination and application of the research.

In line with these principles and strategies, the authors arranged research partnership outcomes and impacts into the following concepts: (a) outcomes and impacts on individual partners; (b)

outcomes and impacts on the partnership; (c) larger community or social outcomes and impacts; (d) research outcomes and impacts.

As another example, Sibley et al. (2022) describe facilitators and beneficial effects of research partnerships on partnership member relations: (a) relations prior to beginning the partnership; (b) emotional bonds among partnership members; (c) trust and respect; (d) honesty; (e) exchange among partnership members, e.g., meetings; (f) synergy; (g) shared decision making power; (h) shared comprehension, e.g., partnership vision shared among partnership members; (i) common and unique principles among partnership members, e.g., although partnership members value equitable participation, some value participation in all research phases, whereas others value participation in only some phases; (j) different ethnicities; (k) ongoing motivation to be involved in a partnership; (l) problem solving; (m) sustainability of the partnership.

They also describe the facilitators and beneficial effects of research partnerships on individual partnership members: (a) diffused influence and liability over decisions, e.g., partnership members have power to influence the research, and accept financial costs associated with the research; (b) appropriate competencies, e.g., organization members understand healthcare domain, and researchers have knowledge of research methods; (c) commitment; (d) renumeration for non-academics; (e) increased research opportunities for academics, e.g., one research partnership can lead to several publications; (f) new knowledge; (g) new practices; (h) increased sense of agency. An overview of knowledge syntheses related to research partnerships can be found in Appendix 1.

Partnership processes are examined within conceptual frameworks. Cargo and Mercer (2008) put forward a framework describing how to perform participatory research within public health: (a)

identify the reason motivating the research, as knowledge utilization (organizational improvement), social justice (emancipation and empowerment), and/or self-determination (research ownership); (b) pinpoint those who will be involved in the research, as academics, service users, service users' personal support system, public, organizational staff, or decision makers, and consider to what extent partners will be engaged in each of the research phases, based on their skills, availability, and interest; (c) go through partnership phases and perform associated tasks: engagement (becoming acquainted with the given organization or community); formalization (recruiting more partners and developing a partnership agreement, which details roles, expectations, and values); mobilization (enfranchising partnership members to take on managerial and leadership roles); maintenance (sustaining the partnership); (d) reflect on the key components of participatory research: mutual respect and trust; capacity building, empowerment and ownership; accountability and sustainability; (e) consider the benefits of participatory research: improves understanding of real-world issue for academics, and meaningfulness and relevance of research for non-academics; improves methodological quality for researchers, and fosters research ownership and capacity building for non-academics; improves quality of interpretation and greater translation of findings for researchers; and fosters greater real-world change for non-academics.

Bach et al. (2017) put forward a framework that describes how to perform participatory research in epidemiology: (a) study purpose is about improving factors that influence population health; (b) specific study questions are constructed in partnership with non-academics; (c) study participants include those with knowledge for transforming population health, e.g., communities, health professionals, policy-makers; (d) methods are adapted for specific contexts, e.g., adapting a questionnaire for a participatory research project with policy makers; (e) data is analyzed in

partnership with non-academics; (f) partnership members coordinate the study together, e.g., attend to partnership dynamics; (g) results are applied into public health policy and practice.

While the partnership literature provides a useful starting point for theorizing, or constructing a theory, i.e., defining the main concepts of research partnerships and proposing relationships between the concepts (Silver, 2019), in this case, participatory research, the literature does not constitute theory, since it does not explain and predict the phenomenon (Bacharach, 1989). Salsberg and Merati (2018) highlight one reason for the lack of a grand (overarching) theory on participatory research:

> Research on the process and outcomes of [participatory health research] is still growing. With each new study, we learn a bit more about what works, for whom, and in what contexts. This contextual condition of [participatory health research] in itself points to the difficulty in locating an overarching framework for [participatory health research]. (p. 213)

Therefore, theories on participatory research should be specific to a given type of participatory research, e.g., OPR theory. Moreover, any theory informed evaluation of participatory research should also be specific to a given type of participatory research, e.g., OPR partnership evaluation.

OPR partnership evaluation: 2015 to 2023

This section examines OPR partnership evaluation from 2015 to 2023. This period was arbitrarily chosen to have around 50 studies by which to assess recent trends in OPR partnership evaluation.

The OPR partnership evaluation literature was searched using a modified version of the search string from two reviews of OPR studies by Bush and colleagues (Bush, Pluye, et al., 2017; Bush, Pluye, et al., 2018) within Scopus (see Appendix 3). Within these reviews, Bush and colleagues synthesized findings related to OPR extra-benefits (Bush, Pluye, et al., 2017; Bush, Pluye, et al., 2018), rather than trends on partnership evaluation. Citations from these two reviews were also examined. OPR empirical studies (with available abstracts) were included. Therefore, the record needed to clearly show: a) research focused on organizational (healthcare) improvement; b) performed in partnership; c) with organization members. Records needed to have been published between 2015 and 2023.

Excluded records related to: (a) OPR and medical education; (b) theoretical models; (c) protocols; (d) CBPR; (e) one research phase only (e.g., planning or dissemination); (f) lessons learned; (g) methodological commentaries (e.g., performing OPR with pharmacists); (h) reviews. Records published before 2015 were excluded.

After reviewing titles and abstracts, 46 records were included for full text analysis. These records represented 43 OPR studies (see Appendix 4), stemming from various countries, including Canada (n=7), Australia (n=5), Iran (n=5), UK (n=3), Germany (n=3), Spain (n=3), Denmark (n=2), Italy (n=2), Colombia (n=2), Belgium (n=1), Switzerland (n=1), Sweden (n=1), Ireland

(n=1), France (n=1), Netherlands (n=1), Taiwan (n=1), United States (n=1), South Africa (n=1), Brazil (n=1), Chile (n=1), Uruguay (n=1), Mexico (n=1), Finland (n=1), and Austria (n=1). Further, the 43 studies were based in various organizations, with the most common being hospitals (n=12).

Only 18 studies reported partnership evaluation as part of the results. These 18 studies stemmed from various countries, including Canada (n=4), Iran (n=3), Australia (n=2), UK (n=2), Colombia (n=2), Switzerland (n=1), Germany (n=1), Netherlands (n=1), Denmark (n=1), Spain (n=1), Brazil (n=1), Chile (n=1), Uruguay (n=1), Mexico (n=1), and Austria (n=1). These 18 studies were based in various organizations, with the most common being hospitals (n=5).

The results of this update are supported by others. Hutchinson et al. (2022) argue "greater attention needs to be paid to the adoption of evaluation approaches to further knowledge about how to optimize partnerships in order to achieve positive outcomes and impact regarding quality and safety of patient care" (p. 165). Hutchinson et al. (2022) further mention that "research to measure the impact of academic-health service partnerships on nurse and others' capability building . . . is also warranted" (p. 165). Moreover, a systematic review found that OPR partnerships were mostly assessed for their effects on learning at the end of the partnership (Kislov et al., 2018).

The importance of partnership evaluation in OPR cannot be understated. Evaluation of an OPR partnership can pinpoint areas of improvement within the partnership (Bowen et al., 2022). Moreover, "in order to map the transformations and impact of action research on the participants and healthcare settings, a critical evaluation of the process is highly recommended. This might

bring relevant contributions to improve action research in healthcare" (Cordeiro & Soares, 2018, p. 1016).

I performed a systematic review in my MSc that led to two products that could be used to assess and improve OPR partnerships: a list of OPR partnership concepts and dimensions and an initial questionnaire (OPREM V2). These are described in the following section.

Systematic Review on OPR partnership evaluation questionnaires

For my MSc thesis, the OPR partnership literature was systematically reviewed to identify OPR partnership questionnaires; detailed information on this review is published elsewhere (Hamzeh et al., 2019). Six questionnaires were included in the review; however, none of the questionnaires assessed all the dimensions of OPR partnerships. Thus, there was a need to develop a new questionnaire that assessed all such dimensions.

The main deliverables from the review were concepts and dimensions of OPR partnerships (Hamzeh et al., 2019) and an OPR evaluation method (OPREM V2) (Hamzeh et al., 2018) developed from other questionnaires, input from OPR stakeholders, frameworks on participatory research (Bush, Pluye, et al., 2018; Cargo & Mercer, 2008; Jagosh et al., 2015; Jagosh et al., 2012), and empirical work (Jagosh et al., 2015). Dimensions of OPREM V2 match those presented within the concepts and dimensions of OPR partnerships.

Description of OPR partnership concepts and dimensions

The OPR partnership concepts and dimensions can be used to assess OPR health partnerships (Hamzeh et al., 2019). The OPR partnership concepts and dimensions define and describe OPR

partnerships. Therefore, OPR stakeholders can use the OPR partnership concepts and dimensions to assess the degree to which partnership dynamics are addressed within an OPR.

The OPR partnership concepts are Trust, Sustainability and Collective learning. Underneath these concepts are numerous dimensions: (a) Supportive Environment; (b) Developing a Common Understanding; (c) Shared Power; (d) Strategic Alignment of Group with Organization; (e) New Knowledge; (f) New Attitudes; (g) New Practices; (h) Problem Solving; (i) Personal Concerns; (j) Commitment; (k) Partnership Cohesion; (l) Effective Resource Allocation; and (m) Synergy.

These OPR partnership concepts and dimensions were used to develop a theory that explains and predicts OPR partnerships (this is explained further in manuscript 1). This theory is compared to other OPR partnership frameworks within the Discussion section of this dissertation.

Description of the OPR Evaluation Method (OPREM)

OPREM V2 (Hamzeh et al., 2018) is a questionnaire to assess OPR partnerships within the health sciences. OPREM V2 contains 95 items, with short answer and closed ended (Likert scale) response options. OPREM V2 was developed by amalgamating items from six OPR partnership evaluation questionnaires identified from my systematic review. The purpose of the OPREM V2 is to provide a partnership 'snapshot' that OPR stakeholders could use to improve their partnership.

Knowledge Gaps with OPREM V2

There are three knowledge gaps with regards to OPREM V2. First, connections between OPR partnership concepts have not been explained and predicted. Doing so is important to develop a theoretical base for OPREM development. According to MacFarlane and Salsberg (2022), "progress is being made to develop research coproduction models and theories but there is more work to be done" (p. 28).

Second, OPREM V2 has not undergone content validation with experts, i.e., the relevance (appropriateness) and representativeness (comprehensiveness) of items (Messick, 1995) has not been assessed with experts (Haynes et al., 1995).

Third, V2 has not been content validated with users (Haynes et al., 1995), i.e., OPR stakeholders who would use the questionnaire. Having a questionnaire that has been validated with users would further improve the accuracy of the assessment, for the given users (Messick, 1995).

To address these knowledge gaps, a three-phase content validation study was performed: theory building (phase 1) and a two-phase mixed methods study (phases 2, e-Delphi, and 3, cognitive and usability testing). Further, a pragmatic epistemological position was adopted. Further details of the study design are found within Appendix 5.

BRIDGE TO MANUSCRIPT 1

This manuscript describes a theory that explains and predicts partnerships within OPR in the health domain. The theory serves as the conceptual foundation of further OPREM validation (manuscripts 2 and 3). Indeed, participants in the mixed methods study (manuscripts 2 and 3) were presented with theoretical definitions prior to evaluating the items. The OPR partnership theory was also important to ensure that any new items suggested during validation procedures were appropriate for the questionnaire (manuscript 3 describes examples of items that were outside the scope of the theory, and were therefore excluded from the OPREM). The OPR partnership theory also helped with the order of the concepts and dimensions, presented in the OPREM, i.e., the theory proposes that Trust and Sustainability each influence Collective learning, so the OPREM first presents items related to Trust, and then Sustainability and finally Collective learning.

The focal construct of the theory is the OPR partnership, and the concepts are Trust, Sustainability and Collective learning. Explanations were developed through fictitious OPR projects in the health sciences. Predictions were developed by thinking about the different ways in which increasing Trust and Sustainability, could lead to an increase in Collective learning. The theory building is in line with the pragmatic position, since one can imagine the outcomes that could hypothetically occur when increasing or decreasing certain variables (Johnson & Onwuegbuzie, 2004). In this paper, the fictitious OPR projects in the health sciences were informed by the authors' methodological expertise, e.g., systematic reviews, qualitative research, and questionnaire development and validation.

CHAPTER 3 MANUSCRIPT 1

COMMENTARY - ASSESSING AND IMPROVING ORGANIZATIONAL PARTICIPATORY RESEARCH HEALTH PARTNERSHIPS THROUGHOUT TIME: AN INNOVATIVE VARIANCE THEORY AND GUIDANCE FOR EVALUATORS

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ABSTRACT

Organizational participatory research (OPR) is a research approach that integrates non-academics into inquiry aimed at evaluating and improving organizational practice. Improved OPR partnerships are the driving force leading to benefits outside the OPR purview. Participatory research partnerships, however, have been traditionally conceptualized with frameworks that describe mechanisms whereby partnership processes produce outcomes (i.e., process approach), rather than explaining why an increase or decrease in partnership concepts influence each other (i.e., variance approach). We argue that evaluating OPR partnerships with a variance ontology is more conducive for theory testing, which may lead to an enhanced understanding on how OPR partnerships operate, and how to improve them. In this paper, we put forward an innovative variance theory that explains and predicts how to improve Trust, Sustainability and Collective learning within OPR partnerships. We then outline the theoretical and methodological contributions of our theory by comparing it to previous work. We conclude by offering practical guidance to evaluators of OPR related partnerships. Evaluators can use our theory and

accompanying guidance to assess OPR partnerships at any point in time, and therefore track OPR partnership improvements.

Keywords: variance theory, organizational participatory research partnership, partnership evaluation

1. INTRODUCTION

The purpose of this paper is to develop an innovative variance theory that explains and predicts partnerships within organizational participatory research (OPR) in the health domain and can be used with accompanying guidance for evaluators, to assess and improve OPR partnerships at any point in time, in accordance with three main concepts: Trust, Sustainability and Collective learning. OPR is research conducted in partnership by academics and members of organizations, with the objective of improving practices within organizations (Argyris et al., 1985; Waterman et al., 2001). With respect to history, OPR studies are grounded in the literature on organizational learning and action science (Argyris et al., 1985). They suggest numerous benefits for partners and partnering organizations.

Bush and collaborators conducted a systematic review synthesizing quantitative and qualitative evidence from OPR studies from around the world (Bush, Pluye, et al., 2017; Bush, Pluye, et al., 2018). They observed OPR-related benefits beyond expected research results, i.e., extra-benefits, in 71 OPR studies. For example, researchers and organization members may experience a deeper understanding of their respective domains of work (i.e., academia vs. organizational practice). Other reviews support the added value of OPR, including: (a) outcomes that are more likely to be useful for organization members (Boaz et al., 2015); (b) new knowledge, attitudes and practices among healthcare practitioners (Boaz et al., 2015); (c) involvement of service users, e.g., patients, in service improvement (De Geest et al., 2013); (d) mixing of skills, and diffused control over research processes (De Geest et al., 2013).

An OPR partnership theory may be useful to help OPR partnership members to evaluate and improve the partnership. As Bowen et al. (2022) state:

> Without effective and ongoing evaluation, however, opportunities for early identification (and remediation) of problems may be missed; and opportunities for growth and improvement of the early research initiative may pass unrecognized. (p. 146)

Theories help people to better comprehend a phenomenon, by explaining and predicting that phenomenon (Bacharach, 1989), e.g., explaining and predicting OPR partnerships and extra-benefits. Up to date, participatory research partnerships have commonly been examined through a process epistemology (Poole, 2006), that is, looking at the sequence of partnership processes and, their associated outcomes, over time (Bush, Pluye, et al., 2018; Huang et al., 2018; Malley et al., 2022; Zych et al., 2020). We propose that such partnerships could also be viewed with a variance epistemology (Poole, 2006), that is, looking at how variation in the quantity of one main partnership concept influences the quantity of other main partnership concepts over time, i.e., track OPR partnership improvement. Chatterji (2016) contends that understanding programs requires evaluating them through both a variance and process lens. Indeed, variance theories transform latent concepts into observable ones (Poole, 2006). Given their consideration of observable concepts, which can be assessed at any point in time, variance theories are well suited for empirical testing. This is an important feature, as testing of an OPR partnership theory may result in the evaluators' deeper understanding of the concepts required for assessing and improving OPR partnerships.

The utility of variance theory can be exemplified by Lester and Wilds (1990), who developed a variance theory that predicts how an increase or decrease in the use of evidence in decision-making, is influenced by an increase or decrease of various factors, e.g., the quality of the research study. Evaluators can use the theory to determine how a program's features increase or

decrease evidence utilization over time. A variance theory examining OPR partnerships would be useful to evaluators, as they can assess all OPR partnership-related concepts at every moment through the lifespan an OPR project, from its inception to its end, i.e., track OPR partnership improvement.

While there are process frameworks related to this topic (i.e., OPR in the health domain) (see Appendix 6), there are no variance theories on the matter. Therefore, our objective is to develop an original theory that describes, explains and predicts relationships between OPR partnership concepts, in line with Gregor (2006)'s definition of theories, using a variance approach (Poole, 2006). Explanatory and predictive theories answer the questions 'what is', 'what will be' and 'why', and therefore produce testable causal relationships with explanations (Gregor, 2006). In this commentary, OPR partnership is the construct under scrutiny. First, we will present the theory itself. Second, we will justify the contribution of our work, by comparing it with existing frameworks and assessment questionnaires. Finally, we will present practical guidance to help evaluators use the theory to assess OPR partnerships.

2. AN INNOVATIVE VARIANCE THEORY TO EXPLAIN AND PREDICT OPR PARTNERSHIPS IN THE HEALTH DOMAIN

2.1 Overview of our theory: essential elements

The proposed theory is based upon four assumptions. First, the theory is centered on OPR partnership concepts, and one forward cycle of OPR (e.g., one OPR project rather than an OPR program with multiple projects). Second, we assume that variation in one OPR partnership-related concept may lead to variation in the other concepts (Poole, 2006).

The construct is the OPR partnership. The definitions of the three main concepts (Trust, Sustainability and Collective learning) are borrowed from Hamzeh et al. (2019) and then refined using guidance from Wacker (2004) and approved by OPR experts (see Appendix 7 and Acknowledgements). Third, the theory is designed for the evaluation of OPR partnerships within the health domain, e.g., OPR that is aimed at improving primary care practices. Fourth, the theory is designed to assess OPR partnerships involving any type of OPR partnership member, e.g., patients, clinicians, policymakers.

This theory provides a novel set of arguments that explain and predict relationships between the three OPR partnership concepts. The explanations and predictions are summarized below. In the next section, they are expanded upon and supported using evidence from recent empirical OPR studies.

The explanations and predictions are threefold. First, increased Trust leads to increased Sustainability for at least four reasons: partnership members (a) are receptive to each other and the OPR work, (b) have clarity on what partnership work entails and how to interact with other partnership members, (c) are empowered to combine ideas, skills, and resources and have more opportunities to become familiar with each other, and (d) feel united in pursuit of a common, organizationally relevant, interest. Second, increased Sustainability leads to increased Collective learning, as partnership members are willing to reflect and discuss throughout the OPR and are dedicated to executing high quality research. Third, increased Trust leads to increased Collective learning, as it amplifies partnership members' understanding of their OPR roles, increases reflection and discussion among partnership members, and increases the practical relevance of the OPR.

Appendix 8 presents a summary of the steps used to build the theory, following the method by Whetten (2002).

2.2 Propositions and arguments to explain and predict OPR partnerships

2.2.1 Proposition 1: The greater the mutual trust among members of the OPR partnership, the more sustainable the OPR partnership.

Imagine a national health agency, primarily concerned with vaccine research. The agency director asks a researcher to synthesize evidence regarding vaccine mixing and health outcomes. The researcher suggests forming an OPR partnership between himself, the agency director, clinicians, and patient partners, to develop best practice guidelines for vaccine mixing, via a systematic review. At the first partnership meeting, members develop a written contract specifying review roles: developing outcomes of interest (patients and clinicians); framing the research question (researcher); choosing eligibility criteria and information sources (all members); identifying, selecting, and appraising studies, and extracting and synthesizing study data (researcher and clinicians); producing vaccine mixing guidelines from results (all members). This contract has several effects. Since they gain the clarity on what they need to do (review role), and with whom (inter-member interactions, in relation to the role, are defined), members become more interested in the review, and develop connections with those with whom they work, e.g., patients brainstorm outcomes of interest with clinicians. Moreover, debates are navigated more easily because roles are generally associated with expertise and value, and, thus, influence the weight of partnership members' arguments on given matters, e.g., researchers yield to patient partners and clinicians regarding outcomes of interest. Further, discussions and synergy happen more naturally, since members contribute knowledge associated to their role. For

example, members realize they should include all empirical studies (quantitative, qualitative, and mixed methods) for a more holistic understanding of vaccine mixing. Also, the researcher and clinicians have an epiphany to improve efficiency through crowdsourcing, i.e., recruiting many clinicians to assist with study identification and selection.

During another partnership meeting, members negotiate for changes to the review sources, which affects the partnership in several ways. First, with this shared power, members are given more opportunities to devote, and combine, their knowledge, skills, and resources. For example, clinicians highlight that certain healthcare organizations publish case reports and qualitative research regarding the effects of vaccine mixing. This gives the researcher the idea to perform a systematic mixed studies review, with a meta-analysis of randomized controlled trials, a narrative synthesis of other quantitative studies, and a thematic synthesis of all included studies including qualitative research. Since members are empowered to share ideas, their confidence promotes empowerment among others to contribute to the discussion, thereby enabling synergy. Further, highly equitable research leads to overcoming differences because it creates a moral imperative to consider others' opinions. It also increases partnership cohesion because one is exposed to certain partnership members more, gets to know them better, and develops a team mentality with them.

As the partnership develops, members respect and value each other more, and this has an impact in several ways. Because the researcher respects patient partners' experience with Covid-19, he aims to understand, and add to, what the patient says, creating synergy. Further, interpersonal cohesion increases, as members see each other more sympathetically, fear reprisal less, and appreciate that they each have knowledge and experiences needed for the review, e.g.,

researchers and clinicians provide methodological and experiential knowledge, respectively. Further, members overcome more problems related to the review, since they are more receptive to each other, e.g., members disagree on the number of bibliographic databases to be searched, given resource constraints, but find a compromise (citation tracking) to ensure no key articles are missed. Moreover, members invest themselves more in the review because they value each other's experiences, and the reasons motivating their interest in the OPR. Since clinicians agree to participate in the review only with compensation for the revenue lost (but without usual highly expensive expert remuneration), other members become more confident knowing that these professionals have the public's best interest at heart. Indeed, such compensation is an important incentive to maintain equity between partnership members because researchers are usually paid by salary, that is they do not lose revenue when they participate in the partnership, while patient partners are compensated for the time they participate.

After some time, preliminary review results are presented to the director. The director appreciates that the meta-analysis produces an objective measure, i.e., effect size measuring the strength between vaccine mixing and health outcomes. Further, the director likes how preliminary results from the meta-analysis are compared with those from the narrative synthesis of other quantitative studies, and a thematic synthesis of all included studies. Therefore, the director sees the value of using diverse sources of evidence to inform guideline development. Because the review is producing high quality evidence on an issue that is relevant for the health agency, the director is motivated to commit resources to extend the partnership work. Further, because of the collective enthusiasm regarding the work, partnership members become more creative, leading to the idea to extend the work through a living systematic review with living guidelines, adapted to patient subgroups, e.g., immunocompromised. Similarly, because of their collective enthusiasm, the

director and researcher can settle a disagreement regarding how the living systematic review will be performed. The researcher is not available to perform the living systematic review but can be consulted every two months to provide methodological assistance. Moreover, the joint excitement around the work makes partnership members feel unified, which improves the connection between them.

2.2.2 Previous studies supporting Proposition 1

Broom et al. (2017) worked with staff from a neonatal care unit, to study how to improve staff transition into a redesigned neonatal unit. Evaluation findings showed that creating various methods of engagement (e.g., newsletters, workshops, and dividing work into smaller groups) (akin to Shared Power) improved the involvement (akin to Commitment) and learning of staff (akin to Collective Learning). Similarly, findings from Cusack et al. (2018), who worked with public health nurses to develop a professional practice framework, showed that the bottom-up nature of participatory research (akin to Shared Power), increased nurses' confidence and enthusiasm for the work (akin to Commitment).

2.2.3 Proposition 2: The greater the sustainability of the OPR partnership, the more collective learning occurs within the OPR partnership.

Picture a sports medicine clinic that wishes to improve clinical collaboration among its health professionals. A physiatrist and a physiotherapist from the clinic consult a researcher, who suggests the three of them form an OPR partnership. The partnership aims to perform an ethnography to observe how health professionals behave around each other. All three members are involved with determining the observation protocol. Because they agree to recruit two

assistants to perform the observations over 3 months, there is a diversity of perspectives feeding into the ethnography, improving internal validity. With more rigorously collected data, clinical collaboration is examined under a wider range of scenarios. Therefore, in this example, more resources (research assistants from the university) and time (increased clinical access to observe) improve the quality of the knowledge generated, and the potential for meaningful practice change.

All three partnership members analyze the ethnographic data. High levels of connectedness among members lead to a smooth analysis of the ethnographic data, as partnership members are united in their pursuit to improve clinical collaboration.

Active discussion during analysis leads to an epiphany: at the start of treatment, a small meeting between the physiatrist, physiotherapist, and the patient, would be helpful to discuss the diagnosis and prognosis of the patient's condition. This would allow the physiotherapist to nuance the exercise regimen to be more medically appropriate. Further, discussion also leads to the idea that at discharge there should be a meeting to discuss how the patient will sustain their health long-term. Thus, in this OPR partnership, synergy generates 'eureka moments' that foster new knowledge and attitudes, e.g., altered perspectives on continuity of care, and ultimately improved practices, e.g., more patient-practitioner meetings.

Once the analysis is complete, the findings show that physiatrists and physiotherapists have 10 weekly interactions, in the form of short, hallway encounters. Physiotherapists, however, do not consider this sufficient and would have rather a one-hour formal weekly meeting to discuss patient care. With limited time, however, physiatrists believe this is unreasonable, but eventually compromise for a formal 20-minute weekly meeting. Physiatrists realize that short interactions

are not as effective for discussing care, as patients may have complex health histories. This attitude and practice shift happens because both parties were willing to engage in a discussion.

2.2.4 Previous studies supporting Proposition 2

Bakhshi et al. (2021) worked with emergency department clinicians and managers to change clinicians' attitude regarding the safety of medication management. Bakhshi et al. (2021) found that a reason health professionals adopted new ways of thinking about handling patient medications (akin to New Attitudes), was because they worked together during the participatory research (akin to Partnership Cohesion).

Within another OPR (Bull et al., 2019), psychologists worked with members from a health education organization, to assist health and social care practitioners change their care practices, through a behavioural change process. Specifically, psychologists worked with members of the health education organization to co-manage the behaviour change program, with psychologists working with practitioners to co-construct a behaviour change intervention. Support from leaders from the health and social care organizations (akin to Supportive Environment) was important to sustain the engagement of their staff (akin to Commitment) in the behaviour change process.

2.2.5 Proposition 3: The greater the trust among OPR partnership members, the more collective learning occurs among them.

Imagine an OPR designed to develop a patient intake evaluation questionnaire at a physical therapy clinic specialized in shoulder injuries. The OPR partnership, including a researcher, physiotherapist, and the clinic director, decides to perform a rapid review of existing shoulder

injury intake evaluation questionnaires, and then choose the most pertinent questionnaire items through a nominal group with physiotherapists, to form a comprehensive patient intake evaluation questionnaire, for shoulder injuries. At the first partnership meeting, members discuss and increase their common understanding of their roles in the questionnaire development. This encourages them to learn principles for how to perform tasks related to their role, e.g., literature review process. Then, by carrying out the task, partnership members gain experience which will improve their practical skills, e.g., performing reviews. Further, partnership members' attitudes towards the task change as they become more familiarized with it, e.g., reviews do not have to be arduous, but can be rapid.

Learning is amplified as mutual support increases among members of the partnership. One of the physiotherapists involved in the nominal group is a new hire with limited experience in treating shoulder injuries. During the nominal group discussion, other physiotherapists begin to doubt his credibility, given lack of experience. This skepticism causes the new hire to refrain from participating in the discussion. Thus, members lose the opportunity to learn from the new hire, i.e., a fresh perspective on what could be useful when evaluating shoulder injuries. Following the nominal group, a preliminary version of the patient intake evaluation questionnaire is created. Because the questionnaire development process was contextualized, i.e., integrating feedback from physiotherapists belonging to the clinic, the director realizes that the questionnaire is highly relevant for their clinic, e.g., uses appropriate terms related to shoulder injuries. Because the director can review the almost finished questionnaire, the director is able to appreciate the value of contextualizing questionnaires (new attitude). Further, because the director has seen the relevance of the questionnaire first-hand, the director develops a keen interest to not only

implement this evaluation questionnaire in their clinic (new practice), but also to develop other contextualized clinical questionnaires in future research (new practice).

Shared decision-making power over the development of the questionnaire influences learning, as it promotes discussion and reflection among partnership members. To fine-tune, and make the questionnaire more useable for patients, e.g., simplify the language, the clinical director suggests further validation procedures, such as cognitive interviewing with a patient. Therefore, the clinical director can think critically about the research methodology, which not only develops her appraisal skills, but also teaches the researcher of alternative questionnaire validation methods. Regarding dissemination, the director might also suggest housing the questionnaire within an electronic platform common to physiotherapy clinics in the region to increase its accessibility; here, the researcher is inspired about ways to disseminate clinical questionnaires in other projects.

2.2.6 Previous studies supporting Proposition 3

Within their study to help health professionals develop safer practices with handling medication, Bakhshi et al. (2021), imply that health professionals became more receptive to changing their practices (akin to New Attitudes), in part due to the decentralized decision making inherent in the participatory research approach (akin to Shared Power), and because this research approach made them feel appreciated (akin to Supportive Environment) and increased their agency to improve their practice.

Results from an OPR aimed at creating a framework for nursing practice in the public health domain, found that a better comprehension of topics (e.g., defining the practice of a nurse within

public health) (akin to New Knowledge), stemmed from regular thinking and discussion (akin to Shared Power) (Cusack et al., 2018). Further, implementing evidence from the broader public health nursing literature within their own practice (akin to Synergy), pushed nurses to think about their practice in a new light, and consider new solutions to their practice problems (akin to New Attitudes).

Within an OPR to assist health and social care professionals implement new care practices (Bull et al., 2019), the attention put on co-production of an intervention (akin to Shared Power), and behaviour change, led practitioners to overcome psychological impediments to practice change (akin to New Attitudes).

3. CONTRIBUTIONS TO KNOWLEDGE, METHODS, AND EVALUATION PRACTICE

3.1 Overview of contributions: What, How, Why, Who and How-to?

This paper proposes a theory that describes, explains, and predicts the relationships among three OPR partnership concepts: Trust, Sustainability and Collective learning (Figure 2). In turn, this theory can be useful for the evaluation of such partnerships. Whetten (1989) states that the contribution of a theory can be described by the 'what', 'how' and 'why' of the theory. The present work is unique as it describes OPR partnerships concepts (what), using a variance approach (Poole, 2006) (how) and provides testable propositions accompanied by explanations (why). We also argue that our theory is unique in that it evaluates OPR partnerships with any kind of partnership member (who). These aspects of contribution are elaborated below and compared with previous work (see Table 2 and Appendix 6). We propose that our theory also

offers the contribution of 'how-to', since it is accompanied by practical guidance for evaluators of OPR partnerships, as described below.

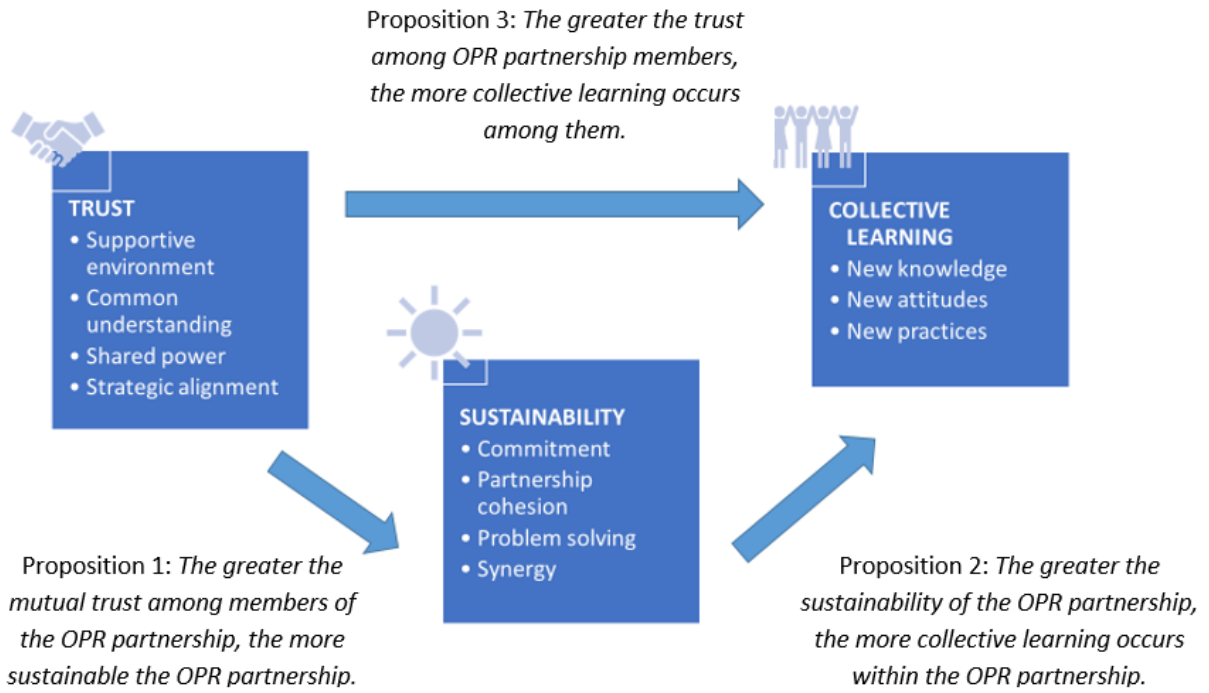

Figure 2. Relationships among organizational participatory research (OPR) partnership concepts

Table 2. Comparing our theory with existing OPR partnership questionnaires

Questionnaire	What: describes OPR partnerships concepts of Trust, Sustainability and Collective learning	How: uses a variance approach (Poole, 2006)	Who: evaluates partnerships containing all types of partnership members
Partnership Indicators Questionnaire (Kothari et al., 2011)	Trust and Sustainability	No	No
Canadian Institutes of Health Research researcher-knowledge user integrated knowledge translation survey (Tetroe, 2011)	Sustainability and Collective learning	No	Yes
Seniors Health Research Transfer Network Community of Practice Evaluation Tool (Lusk & Harris, 2010)	Collective learning	No	No
Community Impacts of Research Oriented Partnerships (CIROP) questionnaire (King et al., 2009)	Collective learning	Yes	No

CIROP Respondent Form (King et al., 2009)	Unclear	No	No
Partnership Strength Survey (Savitz, 2007)	Trust, Sustainability and Collective learning	No	Yes
Our OPR partnership variance theory	Trust, Sustainability and Collective learning	Yes	Yes

3.2 Assessing theoretical contributions through comparison to existing frameworks

The construct is the OPR partnership. The theory proposed in this paper describes interacting partnership concepts over the lifespan of an OPR project, with no sequence in mind. Indeed, our theory posits that Trust can influence Collective learning either directly, or indirectly through Sustainability. This, along with the fact that concepts are defined in a quantifiable manner (using 'The degree to which…' sentences) (see Appendix 7), illustrate how this theory adopts a variance epistemology (Poole, 2006). Further, this theory is built upon the results of a systematic review of OPR partnership evaluations (Hamzeh et al., 2019), hence ensuring comprehensiveness. In contrast, previous work describes partnership concepts as components of a process (Bush, Pluye, et al., 2018; Huang et al., 2018; Malley et al., 2022; Zych et al., 2020). Appendix 6 presents a summary of the theoretical contributions.

The present variance theory contributes to advance knowledge because it details explanations and predictions regarding why three main partnership concepts are related from the inception to the end of an OPR project. In line with Alkin (2017), our theory describes (a) the purpose behind an evaluation, and how to achieve this purpose; (b) the circumstances in which the theory would apply, e.g., at any moment in time over the lifespan of an OPR project. Likewise, according to Cousins (2013), a theory helps to conduct an evaluation. Hansen et al. (2013) mention that evaluation theories (like ours) ought to specify how to conduct an evaluation (concept-driven in our paper), and testable predictions.

In contrast, the process-oriented conceptual framework by Bush, Pluye, et al. (2018) illustrates how OPR partnership processes lead to OPR outcomes, and can be highly useful for building guidance on planning and conducting OPR projects. The process-oriented frameworks by Zych et al. (2020) and Huang et al. (2018) describe processes and outcomes within integrated knowledge translation partnerships, and implementation research partnerships, respectively. The framework by Huang et al. (2018) considers partnerships between those who deliver services and other stakeholders (e.g., between clinicians and researchers), but does not consider partnerships between researchers and other stakeholders (e.g., patients, policy makers). Finally, the framework by Malley et al. (2022) describes the processes through which research-practice partnerships within long-term care, contribute to outcomes. The framework is not for all types of partnership members (long-term care only). None of the above frameworks provide propositions accompanied by explanations.

3.3 Assessing methodological contributions through comparison to existing OPR partnership evaluation questionnaires

Compared to the studies leading to the OPR partnership assessment questionnaires found in our previous review (Hamzeh et al., 2019), our variance theory applies to a wider range of research partnerships fitting the definition of OPR. Table 2 presents a summary of the methodological contributions. To search for questionnaires published since 2016 (the cut-off year for the Hamzeh et al. (2019) review), a three-step approach was applied. First, articles were searched for in Scopus (see Appendix 9 for the search strategy). Second, citations from Hamzeh et al. (2019) were scanned. Third, included questionnaires within a recent review on research partnership questionnaires by Mrklas et al. (2023), were examined. The eligibility criteria was the same as in Hamzeh et al. (2019), i.e., the record needed to show a questionnaire that evaluated OPR partnerships. No new OPR partnership questionnaires were identified. Thus, below, we compare our OPR partnership theory, with questionnaires identified within Hamzeh et al. (2019).

First, the Community Impacts of Research Oriented Partnerships (CIROP) questionnaire (King, et al., 2009) and Partnership Indicators Questionnaire (Kothari et al., 2011) evaluate researcher-community member and researcher-health policy maker partnerships, respectively. In contrast, our theory applies to OPR partnerships involving any member of an organization, e.g., practitioners. Further, while key concepts of our theory are trust and sustainability, they are not for the above questionnaires. On the one hand, the CIROP assesses community change effected by a partnership (akin to collective learning), across the following dimensions: (a) organizational/group access to and use of information, (b) community and organizational development, (c) personal research skill development, and (d) personal knowledge development.

The CIROP Respondent Form collects background data from partnership members, across the following dimensions: (a) Your Personal Relationship with the Partnership; (b) The Partnership's Purpose, Products, and Information Sharing; (c) About You. On the other hand, the Partnership Indicators Questionnaire assesses the performance of researcher-health policy maker partnerships, and not learning. While our theory can assess OPR partnerships at any point during an OPR, this questionnaire includes dimensions that are time specific, thus making the questionnaire process oriented. Common partnership indicators include: (a) Communication (akin to sustainability), (b) Collaborative Research, and (c) Dissemination of Research. However, early partnership indicators include: (d) Research Findings, (e) Negotiation (akin to trust), and (f) Partnership Enhancement, and mature partnership indicators include: (g) Meeting Information Needs, (h) Level of Rapport (akin to sustainability) and (I) Commitment (akin to sustainability).

Second, the Partnership Strength Survey (Savitz, 2007) evaluates organizational-based participatory research partnerships (synonymous to OPR), and includes the following dimensions: (a) Leadership and Management; (b) Critical Characteristics of the Partnership Process; (c) Individual Empowerment; (d) Social Capital & Trust; (e) Synergy (akin to sustainability); (f) Collaborative Problem Solving (akin to sustainability); (g) Shared Learning (akin to collective learning); and (h) About Respondent & Their Views of Partnership. This survey, however, adopts a process approach to conceptualizing partnerships, as evident by the dimension Critical Characteristics of the Partnership Process. Our theory, in contrast, maintains a strict adherence to viewing OPR partnerships through a variance lens.

Third, the Canadian Institutes of Health Research researcher-knowledge user integrated knowledge translation survey (Tetroe, 2011), evaluates a broad range of partnerships fitting the

definition of OPR, given the generality of the term knowledge user. This is commensurate with the scope of our theory, which can assist in the evaluation of OPR partnerships involving any type of partnership member. The dimensions of the survey include: (a) Partnership Details, (b) Study Design, (c) Partnership Outcomes (akin to collective learning), (d) Required Partnerships, (e) Partnership Processes, (f) Information Sharing (akin to sustainability), (g) Next Steps (akin to sustainability), and (h) Facilitating Partnerships. This survey, however, adopts a process approach to conceptualizing partnerships, as evident by the dimension Partnership Processes. However, our theory considers OPR partnerships using a variance approach.

Fourth, the Seniors Health Research Transfer Network Community of Practice Evaluation Tool (Lusk & Harris, 2010), assesses the value of belonging to a community of practice and has two dimensions, Individual Practice Reflection and Community of Practice Attribute Checklist, which are related to the outcomes (akin to collective learning) and processes of OPR partnerships, respectively. Again, here, unlike our theory, this tool adopts a process lens when viewing partnership dynamics. Further, the tool does not evaluate partnerships outside the senior health research domain.

3.4 Lessons learned: Moving from theoretical concepts to smart practical guidance for evaluators

Our innovative theory can be used by evaluators to help them conceptualize the main concepts and dimensions to assess and improve OPR partnerships within the health domain. For evaluators, at least one useful feature of a variance theory is that any theoretical component can be assessed anytime from OPR project inception to its end (process step-1 starts at day-one and may not last long, step-2 starts only after time-two, etc.). Stated otherwise, our variance theory

explains that some trust is present and can be assessed from day one, collective learning starts slowly on day one then increases, and sustainability begins with first events (Pluye et al., 2005). Evaluators can use our theory to gather data related to Trust, Sustainability and Collective learning, and feed this information to organizational leaders, who can decide whether the partnership is improving at a sufficient pace. If so, organizational leaders may decide that continued investment in the OPR partnership is worthwhile.

In terms of reflexive learning, we suggest that evaluators read the definitions of the proposed concepts and dimensions (see Appendix 7), and the hypothetical OPR partnership scenarios and supporting examples from the OPR literature. This can stimulate their evaluative thinking regarding Trust, Sustainability and Collective learning related to such partnerships. Then, they can use the concepts and dimensions to develop an interview guide, for instance, to collect qualitative data concerning OPR partnership dynamics, from a purposeful sample of OPR partnership members. This guide can be used from the beginning to the end of an OPR project, which allows evaluators to document the evolution of the OPR partnership overtime in a consistent manner (cross-time comparison), and act to improve the OPR partnership, when needed.

4. CONCLUSIONS AND THE WAY FORWARD

Our work presents an OPR partnership variance theory and testable propositions, whereas previous frameworks describe partnership processes and their associated outcomes. Further, we found no other theory and questionnaire that evaluates Trust, Sustainability and Collective learning, using a variance approach, for all types of OPR partnership members. Further, there is potential theoretical generalizability, i.e., the ‘where’ and ‘when’ of a theory (Bacharach, 1989).

Given its variance approach, our theory can be used to evaluate OPR partnerships at any time point (when). Given its broad scope, it can also be used for thinking about OPR partnerships across different evaluation traditions, e.g., a community of practice or quality improvement initiative that incorporates OPR, and disciplines within health, e.g., an OPR designed to improve clinical practice or health policies, or outside health, e.g., social services, education, and organizational behavior where OPR partnerships exist (where). Moreover, our theory is capable of being tested, that is, being used for analyzing and predicting changes within OPR partnerships.

While our theory may not capture the 'whole picture' regarding OPR partnerships, it does set the stage for future empirical development. In future research with experts and users, we will validate a structured questionnaire to evaluate OPR partnerships using partnership members' feedback. Results of such evaluation can lead to improve three main concepts of partnerships: Trust, Sustainability and Collective learning.

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COMPETING INTERESTS

None

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AUTHORSHIP

JM led the theory building (including the development of theoretical definitions, propositions, explanations, and assumptions) and the conceptualization and writing of this commentary. CH, PB, and PP assisted with the revision of this commentary. PP produced the figure illustrating the OPR partnership theory.

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BRIDGE TO MANUSCRIPT 2

This manuscript presents the first component of the larger mixed methods project within this dissertation, i.e., a quantitative study. In this study, OPR experts from around the world took part in an e-Delphi to build consensus on the OPREM V2 items, and results were used to develop an OPREM V3. This study responded to Haynes et al. (1995) steps (f) assess each item and (j) let experts assess the tool. Results from this study, i.e., OPREM V3, were fed into the subsequent qualitative study (manuscript 3).

The Delphi is also aligned with the pragmatic approach. The pragmatic worldview recognizes that pluralism is important (Johnson & Onwuegbuzie, 2004) and within the Delphi, an international sample of OPR stakeholders (patient-partners, practitioners, organization members, graduate students, and researchers), were recruited as experts.

The items used within the Delphi derive from the OPREM V2, which is based on a systematic review of OPR partnership evaluation questionnaires, performed by Hamzeh et al. (2019). To prepare for the Delphi, my thesis committee members (Catherine Hudon (CH), Paula Bush (PB), Pierre Pluye (PP), Isabelle Vedel (IV) and Maud-Christine Chouinard (MCC)) revised and reduced the OPREM V2 items and dimensions.

JM presented the 95 items, dimension by dimension, and CH, PB, PP collectively (a) discussed the clarity of items; (b) deleted unclear items; (c) merged similar items; (d) modified the wording of items (if necessary); (e) did not suggest new items; (g) reduced the number of dimensions. This resulted in the 95 items being reduced to 44 items, and 13 dimensions being reduced to 11. Next, JM presented the 44 items, dimension by dimension, and IV and MCC collectively (a)

discussed the clarity of items; (b) deleted unclear items; (c) merged similar items; (d) modified the wording of items (if necessary); (e) did not suggest new items. IV, MCC, CH, PB, PP also discussed and modified the wording of dimensions and response options. This resulted in the 44 items being reduced to 35 items. Thus, the experts recruited for the e-Delphi assessed 35 partnership evaluation items.

CHAPTER 4 MANUSCRIPT 2

VALIDATING A METHOD TO ASSESS ORGANIZATIONAL PARTICIPATORY RESEARCH HEALTH PARTNERSHIPS: AN INTERNATIONAL DELPHI STUDY

AUTHORS

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ABSTRACT

Background

Organizational participatory research (OPR) is a strategy aimed at improving organizational practice through a partnership between academic researchers and members belonging to organizations, e.g., health service organizations. Evaluating OPR is important to become aware of areas of improvement within the partnership which are needed to produce the benefits of OPR. An OPR evaluation method (OPREM V2) was developed; however, the OPREM V2 has not been validated with OPR experts. Therefore, the aim of this study is to assess the relevance, clarity, and representativeness of the OPREM V2 items (n=35), with OPR experts.

Methods

An international sample of 42 OPR stakeholders (patient partners, practitioners, organization members, graduate students, and researchers), were recruited as experts to participate in a

modified e-Delphi. Over two rounds, experts completed online surveys to build consensus on OPR partnership evaluation items. They evaluated the relevance, clarity, and representativeness of items. Medians and percentages for data related to relevance and clarity, respectively, were calculated. Given that median relevance scores were high for all items, the percentages of experts rating items as clear were used to decide whether to keep items as is, or modify, or eliminate them. Expert comments were used to revise items, as needed. To improve the representativeness of items for a given dimension, they were also asked to suggest additional items as needed, after each dimension.

Results

Forty-one out of 42 experts completed or partially completed the first survey round. Twenty-eight out of the 41 experts from the previous round, completed or partially completed the second survey round. Results from both rounds were used to produce the Organizational Participatory Research Evaluation Method (OPREM) V3, containing three concepts (37 items): (a) Trust (15 items); (b) Sustainability (13 items); (c) Collective Learning (nine items).

Conclusion

The OPREM V3 is a tool that can be used to assess OPR partnerships within the health services domain. This tool can help OPR stakeholders to develop questions for evaluation of their partnerships, and ultimately generate data that can be used to improve their partnerships, and hence, their organizational practice.

Keywords: Delphi, organizational participatory research, partnership evaluation

BACKGROUND

Organizational participatory research (OPR) is an approach based on a research partnership between academics and organization members (such as administrators, health care practitioners, other staff members, and patient partners) to produce evidence leading to an improvement in organizational practice (Argyris et al., 1985; Waterman et al., 2001), and is rooted in action science and organizational learning (Argyris et al., 1985). Knowledge syntheses highlight that OPR may lead to: (a) findings that are more clinically pertinent (Boaz et al., 2015); (b) knowledge, attitudes, and practices that are developed by clinicians (Boaz et al., 2015); (c) research decision-making that is more decentralized (De Geest et al., 2013); (d) the combination of competencies from different partnership members (De Geest et al., 2013); (e) practice improvement that spans the entire organization (Bush, Pluye, et al., 2017).

Although frequent partnership assessment is a facilitator of OPR partnerships (Beal, 2012), only 18 out of 43 OPR studies from 2015 to present report partnership evaluation in their results (Bakhshi et al., 2021; Broom et al., 2017; Bull et al., 2019; Cusack et al., 2018; Fox et al., 2023; Haesebaert et al., 2020; Khorasani et al., 2015; Krieger et al., 2020; Laur et al., 2018; León-Arce et al., 2022; Lette et al., 2020; Paltved et al., 2016; Plunger et al., 2020; Sarvestani et al., 2017; J. Taylor et al., 2015; Vargas, Eguiguren, Mogollón-Pérez, Bertolotto, et al., 2020; Vargas, Eguiguren, Mogollón-Pérez, Samico, et al., 2020; Vázquez et al., 2022; Vizeshfar et al., 2021; Zaforteza et al., 2015) (note that (Vargas, Eguiguren, Mogollón-Pérez, Bertolotto, et al., 2020; Vargas, Eguiguren, Mogollón-Pérez, Samico, et al., 2020; Vázquez et al., 2022) evaluate the same OPR study).

When discussing action research (i.e., OPR), Montgomery et al. (2015) highlight that "the lack of appropriate evaluation is a serious concern" (p. 745). Montgomery et al. (2015) further highlight that "the field of [action research] interventions would benefit from a theoretical framework that has the ability to guide the methodology and evaluation processes" (p.745). To this end, the OPR evaluation method (OPREM V2) is a 95-item questionnaire that assesses OPR partnerships, based on a systematic review of OPR partnership questionnaires (Hamzeh et al., 2018; Hamzeh et al., 2019). A recent theory (Hamzeh, Hudon, Bush, & Pluye, 2023) has described the key concepts of OPR partnerships upon which the OPREM V2 is based, namely Trust, Sustainability and Collective learning. To ensure the items are relevant and representative (Messick, 1995) of these concepts, however, the OPREM V2 needs to be validated with OPR experts (Haynes et al., 1995). Therefore, the aim of this study is to assess the relevance, clarity, and representativeness of the OPREM V2 items, with OPR experts.

METHODS

Design

A Delphi method was used "for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem" (Linstone & Turoff, 2002, p. 3). The Delphi was modified as it contained less rounds than a classic Delphi (Keeney, 2015). This study responded to two validation steps from Haynes et al. (1995), namely to assess each item, and let experts assess the tool. For each dimension of the OPREM V2, international OPR experts built consensus on the items.

This study was approved by the McGill Institutional Review Board (study #A01-E04-17A). Experts were asked to read a consent form, prior to beginning the survey. It made explicit that their responses would remain anonymous from the other experts and from members of the research team.

Setting

This Delphi was an e-Delphi because experts rated items using an online survey (Keeney, 2015). Recruitment took place from November 2021 to March 2022. Between March and June 2022, experts completed two rounds of the online survey.

Participants

There were several eligibility criteria to be considered an expert. First, an expert must have been an OPR stakeholder (patient partner, practitioner, organization member, graduate student, or researcher) that has been or is currently involved in an OPR project with health organizations. Second, stakeholders were recruited if they had been involved as co-decision makers for either the planning, implementation, or dissemination stage of an OPR project. This was done to increase the number of experts recruited. Third, experts must have had a valid email address and replied to the email invitation (delivery and read receipts were enabled to ensure that emails were delivered and read).

An international OPR expert panel for the Delphi was recruited (purposeful sampling). To do this, authors of OPR studies included in a previous review by Bush, Pluye, et al. (2017) were contacted via email. Further, authors from newly identified OPR studies, were also contacted via

email. Finally, personal contacts of the research team, and members from the Committee on Advancing the Science of Family Medicine (CASFM) (https://www.napcrg.org/aboutus/committees/) were invited via email, since PB, a member of this committee, knew that some members were potential OPR experts. To maximize the sample, OPR experts were asked to nominate other OPR experts (snowball sampling (Browne, 2005)). Within the field of participatory research, recent Delphi studies focused on instrument refinement have recruited between 16 and 23 participants (Coombe et al., 2020; Goodman et al., 2019; Humphries et al., 2019). Within the present study, the aim was to recruit at least 25 experts.

The Dillman et al. (2014) recommendations for increasing participant recruitment and retention rates in survey research, were used to design the survey recruitment and administration emails. Regarding emails, the recommendations were modified, and experts were sent an invitation email, without a survey link, given that it was anticipated survey development would occur over several months. Once survey development was complete, experts were sent an email with a link to the survey. Experts were sent out two reminder emails.

OPREM V2

The three concepts, namely Trust, Sustainability and Collective learning, contained thirteen dimensions (sub-concepts). The four specific dimensions within Trust were (a) Supportive Environment; (b) Developing Common Understanding; (c) Shared Power; and (d) Strategic Alignment of Group with Organization. The four specific dimensions within Sustainability were (a) Commitment; (b) Partnership Gelling; (c) Effective Resource Allocation and (d) Synergy. The five specific dimensions within Collective learning were (a) Problem Solving; (b) Personal

Concerns; (c) New Knowledge; (d)New Attitudes; and (e) New Practices (Hamzeh et al., 2018; Hamzeh et al., 2019).

Data Collection

Considerable preparatory work was performed to reduce the number of items for the e-Delphi. IV, MCC, CH, PB, and PP, refined the dimensions and items within the OPREM V2. This refinement resulted in the 95 items from the OPREM V2, to reduce to 35 items.

This refinement also resulted in the thirteen dimensions to reduce to eleven dimensions. The four specific dimensions within Trust were (a) Supportive Environment; (b) Common Understanding; (c) Shared Power; and (d) Strategic Alignment. The four specific dimensions within Sustainability were (a) Commitment; (b) Partnership Cohesion; (c) Problem Solving; and (d) Synergy. The three specific dimensions within Collective learning were (a) New Knowledge; (b) New Attitudes; and (c) New Practices.

Over two rounds, experts completed online Lime Surveys, to build consensus on the 35 OPR partnership evaluation items. In rounds one and two, experts were asked to indicate their OPR role, defined as the stakeholder they represented within the OPR (patient-partner, practitioner, organization member, graduate student, or researcher). Further, in both rounds, dimensions were defined and presented with their corresponding items.

In round one, experts were asked to evaluate the relevance, clarity, and representativeness of items. According to Messick (1995), relevance and representativeness are key criteria when assessing the validity of questionnaires. Relevance is the degree to which items are appropriate

(Messick, 1995). Clarity assesses whether items are understood by respondents. Representativeness assesses the completeness of items for a given dimension (Messick, 1995). Through Lime Survey, experts rated the relevance of items using a 4-point LIKERT scale (Not at all relevant=1, A little relevant=2, Relevant=3, Very Relevant=4), and the clarity of items with a 'Yes' or 'No' (see Appendix 10). Further, they were asked to comment on their answers and suggest modifications as needed. To improve the representativeness of items for a given dimension, they were also asked to suggest additional items as needed, after each dimension and on the final survey page. In round two, experts were asked to rate the relevance and clarity of modified or newly added items, which were organized according to their corresponding dimension. Finally, experts were asked to comment on their answers and suggest modifications as needed.

The Dillman et al. (2014) recommendations were used to design the visual layout of the survey. Further, in line with these recommendations, the surveys were pilot tested using various electronic devices (e.g., laptop, cellphone) and online browsers (e.g., Google, Safari) (see Acknowledgements for list of pilot testers). Following testing, several changes were made, such as adding 'mouse-over' definitions for key terms within items (see Appendix 10).

Data Analysis

Keeney et al. (2011) recommend analyzing data descriptively within a Delphi. Quantitative data was inputted into SPSS and STATA, and analyzed descriptively, as described below. First, medians for data related to relevance and percentages for data related to clarity, were calculated. JM and AB (using SPSS) and IB (using STATA) each analyzed rating data from round one, and JM and AB (using SPSS) each analyzed rating data from round two. JM (using SPSS) analyzed

data related to the number of experts and their OPR roles, from rounds one and two. Data was used from both those who completed, or only partially completed, the surveys.

Second, given that all items had a median relevance rating of 3 or 4, ratings of clarity were used to determine consensus on whether to keep items as is, or modify, or eliminate them (see Table 3). Thus, consensus was determined as follows: (a) items were kept for the OPREM as is, when the clarity rating was greater than or equal to 85%; (b) items were kept for round two and revised, when the clarity rating was greater than or equal to 70% but less than 85%; (c) items were eliminated when the clarity rating was less than 70%. Any new item was sent to round two. Experts' comments were used to assist in the revision of items. JM made the decisions based on the ratings and comments, and PP and CH reviewed and approved his decisions.

After the second round, ratings of clarity were again used to decide whether to keep items as is, or modify, or eliminate them (see Table 3), and the same cut-offs used in round one, were used in round two. Experts' comments were used to assist in the revision of items. Again, JM made decisions using ratings and comments, with PP and CH reviewing and approving his work.

The OPREM V3 was produced from the final list of items.

Table 3. Consensus decision making

Item	Median relevance	% Yes clear	Decision Q – keep for OPREM questionnaire R – keep for round two and clarify if needed E –Eliminate	Modified item (if applicable)	Rationale

RESULTS

Participants

Overall, 42 experts agreed to participate. In the first round, 41 out of 42 experts completed or partially completed the survey, representing a 97.6% response rate. Those who responded included 35 researchers (85.4%), three organization members (7.3%), one graduate student (2.4%) and one patient partner (2.4%). There was missing data for one expert regarding their OPR role (2.4%). In the second round, 28 out of 41 experts from the first round, completed or partially completed the survey, representing a 68.3% retention rate. Those who responded included 23 researchers (82.1%), two organization members (7.1%), one patient partner (3.6%), and one practitioner (3.6%). There was missing data for one expert regarding their OPR role (3.6%).

The 42 experts were from various countries, including the UK (n=10), Canada (n=9), Australia (n=4), Spain (n=4), United States (n=3), Denmark (n=2), Italy (n=2), South Africa (n=1), Ireland

(n=1), Netherlands (n=1), Pakistan (n=1), Switzerland (n=1), and unclear country (n=3). Moreover, experts were from a diversity of departments, including nursing (n=11), primary care or family medicine (n=6), clinical or health sciences (n=4), dementia or geriatric care (n=3), health and social care (n=2), other department (n=10) and unclear department (n=6).

Main findings

The results of the Delphi are described in Tables 4 and 5. See Appendix 11 for a presentation of the full results.

Table 4. Results from round one of the e-Delphi

Item	Median relevance (from 1 to 4)	% Yes clear	Decision Q – keep for OPREM questionnaire R – keep for Round 2 and clarify if needed E – Eliminate
1.1. Supportive Environment: The degree to which academics and non-academics perceive they are valued.			
1. Core group members consider each other's knowledge as important and valid.	4	92.1	Q
2. Core group members are at ease to express their views.	4	94.7	Q
3. Leaders from the different organizations approve each phase of the research process.	3	71.1	R
1.2. Common Understanding: The degree to which academics and non-academics have developed a formal partnership agreement (along a continuum from no discussion to a detailed written contract).			

Please indicate the way the core group members addressed the following:			
New item: Partnership values			R
New item: Data ownership			R
4. Objectives of partnership	4	81.6	R
5. Roles and responsibilities of core group members	4	84.2	Q
6. Deliverables of the partnership	3	63.2	E
7. Timelines of the partnership activities	4	84.2	Q
1.3. Shared Power: The degree to which academics and non-academics have equal authority in making decisions about the research.			
Please specify the level of decision-making power at each research phase:			
8. Shaping the research question(s)	4	92.1	Q
9. Deciding on the methods	3	89.5	Q
10. Interpreting the study results	4	92.1	Q
11. Putting results into practice	4	84.2	R
1.4 Strategic Alignment: The degree to which academics and non-academics conduct research that is relevant to the organization (including the application of results).			
12. Core group members understand organizational leaders' priorities	4	86.5	Q
13. The partnership's priorities fit with organizational leaders' priorities	4	89.2	Q
New item: The partnership research objectives relate to organizational priorities.			R
2.1 Problem Solving: The degree to which academics and non-academics settle difficulties.			

14. Core group members are effective in problem solving	3	78.4	R
15. Disagreements do not hinder the functioning of the core group	4	78.4	R
16. Conflict between core group members is dealt with openly	4	91.9	Q
2.2 Commitment: The degree to which academics and non-academics are invested in their partnership.			
17. Core group members are committed to the partnership	4	91.9	Q
18. The time investment from your organization in the partnership is appropriate	4	86.5	R
19. Core group members have discussed the continuation of their relationship after the research project is complete	3	81.1	R
2.3 Partnership Cohesion: The degree to which academics and non-academics are unified while working on the research.			
20. Core group members communicate with each other respectfully	4	97.3	Q
21. Core group members can adapt to each other's needs	3	89.2	Q
22. Core group members support each other publicly	3	89.2	Q
23. Core group members are open to revising plans and timelines	4	91.9	Q
2.4 Synergy: The degree to which academics' and non-academics' perceived benefits of the partnership are greater than the potential benefits of a similar research project without partnership (synergistic partnerships' benefits being increased knowledge, skills and resources – surpassing partnerships' drawbacks such as time investment).			
24. The partnership's benefits are worth the partnership's drawbacks	4	78.4	R

25. The partnership has led to new learning within my organization	4	91.9	Q
26. The partnership has led to new routinized activities within my organization	3	81.1	R
27. The partnership has led to extra benefits (outside the research objectives)	3	91.9	R
3.1. New Knowledge: The degree to which academics and non-academics perceive that they have developed a better consciousness of their practice.			
Please indicate to what degree the partnership has increased:			
New item: Core group members' understanding of the topic under study			R
28. Core group members' awareness of their different perspectives	4	91.9	Q
29. Core group members' understanding of the implication of research results for their organizational practice	4	89.2	R
3.2 New attitudes: The degree to which academics and non-academics perceive they have renewed their feelings about their own professional practice and routines, and the organization overall (e.g., their perception regarding how the health organization(s) value(s) scientific evidence and its application in practice).			
Please indicate to what degree the partnership has:			E
30. Increased core group members' receptiveness to new ideas from members of their respective organizations	3	86.5	R
31. Increased core group members' view that working together is more likely to have an impact	4	94.6	R
32. Reduced core group members' resistance to change certain aspects of their organizational practice	4	83.8	R

3.3 New practices: The degree to which academics and non-academics perceive that they have acquired new practices (including the improvement of current practices).			
Please indicate to what degree the partnership has improved:			E
33. Core group members' capacity to undertake organizational participatory research	4	94.4	Q
34. Core group members' ability to ask relevant organizational participatory research questions	4	86.1	Q
35. Core group members' organizational practice	3	72.2	R

Table 5. Results from round two of the e-Delphi

Item	**Median relevance, if applicable (from 1 to 4)**	**% Yes clear**	**Decision Q – keep for OPREM questionnaire R – keep for OPREM and clarify E – Eliminate**
1.1. Supportive Environment: The degree to which academics and non-academics perceive they are valued.			
Leaders from the different organizations approve the research process.	3	84.2	R
1.2. Common Understanding: The degree to which academics and non-academics have developed a formal partnership agreement (along a continuum from no discussion to a detailed written contract).			
Please indicate the way the core group members addressed the following:			
New item: Partnership values	4	88.9	Q
New item: Data ownership	4	100	Q

Goals of the partnership	4	88.2	Q
1.3. Shared Power: The degree to which academics and non-academics have equal authority in making decisions about the research.			
Please specify the level of decision-making power at each research phase:			
Knowledge translation plan	4	80	R
1.4 Strategic Alignment: The degree to which academics and non-academics conduct research that is relevant to the organization (including the application of results).			
New item: The partnership research objectives relate to organizational priorities.	4	78.9	R
2.1 Problem Solving: The degree to which academics and non-academics settle difficulties.			
Core group members try to solve problems when possible	4	90.5	Q
Disagreements between core group members do not hinder the research process	4	81	R
2.2 Commitment: The degree to which academics and non-academics are invested in their partnership.			
The time investment from core group members in the partnership is appropriate.	4	90	Q
Core group members discuss the opportunity to continue their relationship after the present research project	3	95.2	Q
2.4 Synergy: The degree to which academics' and non-academics' perceived benefits of the partnership are greater than the potential benefits of a similar research project without partnership (synergistic partnerships' benefits being increased knowledge, skills and resources – surpassing partnerships' drawbacks such as time investment).			
The partnership's benefits are worth the partnership's inconveniencies	4	81	R
The partnership has led to new organizational routines	3	80	E

The partnership has led to extra benefits (outside the research goals)	3	95.2	Q
3.1. New Knowledge: The degree to which academics and non-academics perceive that they have developed a better consciousness of their practice.			
Please indicate to what degree the partnership has increased:			
New item: Core group members' understanding of the topic under study	4	95.2	Q
Core group members' understanding of the added value of research results for improving organizational practice	4	90.5	Q
3.2 New attitudes: The degree to which academics and non-academics perceive they have renewed their feelings about their own professional practice and routines, and the organization overall (e.g., their perception regarding how the health organization(s) value(s) scientific evidence and its application in practice).			
Core group members have increased their receptiveness to new ideas from each other	3	95.2	Q
Core group members have increased their receptiveness to the idea that working together is more likely to have an impact	4	100	Q
Core group members have increased their receptiveness to organizational practice change	4	94.7	Q
3.3 New practices: The degree to which academics and non-academics perceive that they have acquired new practices (including the improvement of current practices).			
Core group members' satisfaction with their experience of the organization has improved.	3	81	R

In round one, expert feedback and ratings led to the modification of 15 items, the addition of four new items, and the deletion of one item. No modification was made to 15 items. Items from the partnership cohesion dimension were left unmodified.

As shown in Table 4, items 5 and 7 had a clarity rating of 84.2%. Since the clarity rating was near to 85%, they were kept for the OPREM as is. Moreover, item 18, The time investment from your organization in the partnership is appropriate, had a clarity rating of 86.5%; however, it was kept for round two and modified to The time investment from core group members in the partnership is appropriate, since an expert suggested the need to assess the time investment of each partner. Further, item 27, The partnership has led to extra benefits (outside the research objectives), had a clarity rating of 91.9%; however, it was kept for round two and the word "objectives" was changed to "goals" to be consistent with item 4, Goals of partnership. Further, item 29, Core group members' understanding of the implication of research results for their organizational practice, had a clarity rating of 89.2%; however, it was kept for round two and modified because experts suggested that with the word 'their', academics would be confused if OPR was about improving academic organization practice. Further, items 30 and 31, were modified (grammar shift) since experts thought it was confusing to read 'increased' at the start of the items.

In round two, expert feedback and ratings, led to the modification of six items, and deletion of one item. No modifications were made to 12 items. No new item was added. The item The partnership has led to new organizational routines, had a clarity rating of 80%; however, it was eliminated because the item was redundant with the new practices dimension.

OPREM V3

The final list of items to be included within the OPREM, is shown in Appendix 12. There are 37 items representing 11 dimensions, with three to five items per dimension. Trust has the most items (n=15), followed by sustainability (n=13) and collective learning (n=9). The OPREM V3 is

a questionnaire that has been validated by experts and can be used by all OPR partnership stakeholders to assess and improve their OPR partnerships.

DISCUSSION

A modified, e-Delphi was conducted, with OPR experts from around the world, to produce a validated OPREM V3 for all health service contexts (see Appendix 12).

Those OPR partnership members wanting to use the OPREM V3, can do so by developing discussion questions based on the items. These questions can be used to evaluate OPR partnerships throughout their lifespan, as described below. At the middle of an OPR, the OPREM can be used to help OPR stakeholders take stock of the areas in the partnership that require improvement. For example, the questionnaire can be used to evaluate the shared power among partnership members. This evaluation data from the OPREM can then be used by OPR partnership members to improve their partnerships. For example, because of working in an OPR and completing the OPREM, health decision makers may become more cognizant of the need to incorporate the perspective of health organization members when drafting evidence-based policy.

The OPREM can also be used to assess the impact of the partnership, at the latter stages of an OPR. For example, the questionnaire can assess new knowledge, attitudes, and practices among partnership members. At any phase of an OPR, the OPREM can be used to highlight the values and assumptions that OPR partnership members hold, which need to be transformed for learning to occur (Argyris et al., 1985). For example, while evaluating and discussing commitment, partnership members who are non-academics may realize that part of the reason contributing to

their lack of commitment stems from their belief that knowledge cannot derive from practical experience.

Compared to previous OPR partnership questionnaires, the OPREM V3 is a validated tool that assesses Trust, Sustainability and Collective learning in OPR partnerships. There are several validated OPR partnership questionnaires in the literature, however these do not evaluate all OPR partnership concepts. For example, the Partnership Indicators Questionnaire (Kothari et al., 2011) evaluates trust and sustainability. The Community Impacts of Research Oriented Partnerships (CIROP) questionnaire (King et al., 2009) evaluates collective learning. The Canadian Institutes of Health Research researcher-knowledge user integrated knowledge translation survey (Tetroe, 2011) evaluates sustainability and collective learning. The Seniors Health Research Transfer Network Community of Practice Evaluation Tool (Lusk & Harris, 2010) evaluates collective learning. The Partnership Strength Survey (Savitz, 2007) evaluates Trust, Sustainability and Collective learning; however, this questionnaire has not been validated.

Strengths and limitations

The present Delphi study has strengths. Whereas previous Delphi studies for the refinement of participatory research instruments (Coombe et al., 2020; Goodman et al., 2019; Humphries et al., 2019) recruited between eight and 23 experts from the United States, the present Delphi recruited between 28 (round 2) and 41 (round 1) experts from across the world.

One limitation of the Delphi was the inability to modify an administered survey, within Lime Survey. Thus, the round two survey needed to be developed as a new survey. As such, participants were asked twice to indicate their OPR role, which may have led to inconsistent

answers, as noted from the appearance of a practitioner in the round two survey, who was not present in the round one survey data. Another limitation was a relatively low number of patient partners, practitioners, and organization members involved. Thus, the high proportion of researchers may have led to higher ratings of clarity, since researchers may be more likely to comprehend items worded in a complex manner. Future research can perform validation of the OPREM with users (Haynes et al., 1995).

CONCLUSION

This Delphi study validated items for assessing OPR partnerships, with a panel of international OPR experts, to produce the OPREM V3 questionnaire. This questionnaire has 37 items that evaluate Trust, Sustainability and Collective learning within OPR partnerships. OPR members in the health services domain from any country can use the OPREM V3 for evaluating their partnerships, and use OPREM data to improve their OPR partnerships, and, hence, health practice and policy.

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COMPETING INTERESTS

None

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AUTHORSHIP

JM conceptualized the Delphi study, led study recruitment, survey development, testing and administration, survey data analysis and interpretation, and wrote the manuscript. PB, CH and PP were involved with conceptualization of the study, and PB and PP were involved in study recruitment, whereas CH and PP were involved with interpreting survey data, and PP with survey testing. PB, CH, PP, MCC and IV were involved with substantively revising the OPR partnership evaluation dimensions and items, to be included within the Delphi survey. AB and IB were involved with survey data analysis. All authors assisted with revising the manuscript.

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BRIDGE TO MANUSCRIPT 3

The following manuscript will describe the qualitative inquiry that was used to validate the OPREM V3 with users from the primary health care context, to develop an OPREM V4. According to the World Health Organization (n.d.):

> Primary health care is a whole-of-society approach to effectively organize and strengthen national health systems to bring services for health and wellbeing closer to communities. It has 3 components: [1] integrated health services to meet people's health needs throughout their lives[;] [2] addressing the broader determinants of health through multisectoral policy and action[;] [and] [3] empowering individuals, families and communities to take charge of their own health. (Overview section, para. 2)

Consistent with this definition, users were recruited from clinical practice, health policy and health promotion primary health care partnerships. Users took part in cognitive interviews in which they spoke about their perceptions of OPREM items, and the usability of the OPREM, for their primary health care context. This research responded to steps (h) develop instructions and (k) let users assess the tool, of Haynes et al. (1995).

This study is aligned with pragmatism. The pragmatic worldview recognizes that pluralism is important (Johnson & Onwuegbuzie, 2004), and in this study, patient partners, organizations members, and researchers were recruited as participants. Moreover, the pragmatic worldview recognizes that our understanding of reality is constantly changing (Johnson & Onwuegbuzie, 2004) – e.g., validation is ongoing and dependent on context (Messick, 1995).

CHAPTER 5 MANUSCRIPT 3

VALIDATION AND USABILITY TESTING OF AN ORGANIZATIONAL PARTICIPATORY RESEARCH EVALUATION METHOD: A QUALITATIVE INQUIRY WITH PRIMARY HEALTH CARE USERS

AUTHORS

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ABSTRACT

Background

Organizational participatory research (OPR) is an approach to improve organizational practice through a partnership between organization members and academic researchers. An OPR evaluation method (OPREM V2) was developed that assesses OPR partnerships to improve them. While the OPREM has been validated with experts (OPREM V3), it has not been validated with users. The OPREM could be useful to evaluate OPR partnerships in primary health care.

Objective

The objective was to validate the OPREM V3 with users from primary health care to produce an OPREM V4. The research question was: What are the perceptions of users from primary health care regarding the OPREM V3?

Design

Cognitive and usability testing was undertaken. Specifically, cognitive interviews were conducted with a key informant sample of 17 stakeholders from Canadian OPR primary health care partnerships. Stakeholders were asked about their perception of OPREM V3 items (n=37), and the usability of the OPREM V3, for their OPR partnerships. Data analysis of cognitive interviews included identifying similarities, complementarities, and differences among interviews to improve OPREM V3.

Results

The OPREM V4 has 30 items, which represent three concepts (Trust, Sustainability and Collective learning) and 11 dimensions. Trust has 14 items, sustainability has 10 items, and collective learning has 6 items. There are between two and five items per dimension. New features were added to the OPREM V4, including instructions, an overview of the OPREM concepts and dimensions, and indications about which OPREM items are better evaluated when some research results have been collected.

Conclusion

The OPREM V4 is a validated questionnaire that can be used by stakeholders within OPR primary health care partnerships. Evaluation data from the OPREM V4 can be used to improve these partnerships, and ultimately, primary health care policy and practice.

Keywords: Cognitive and usability testing, organizational participatory research, partnership evaluation

INTRODUCTION

In organizational participatory research (OPR), organization members and academic researchers work together to better organization practices (Argyris et al., 1985; Waterman et al., 2001). OPR can occur within many health organizations, such tertiary, secondary, and primary health care organizations. According to the World Health Organization (n.d.):

> Primary health care is a whole-of-society approach to effectively organize and strengthen national health systems to bring services for health and wellbeing closer to communities. It has 3 components: [1] integrated health services to meet people's health needs throughout their lives[;] [2] addressing the broader determinants of health through multisectoral policy and action[;] [and] [3] empowering individuals, families and communities to take charge of their own health. (Overview section, para. 2)

Performing OPR in this context is important because it may lead to better primary health care (Rosser & Martin, 2005), which is associated with lower spending across healthcare systems and improved equity in health (Starfield et al., 2005), and reduces strain placed on secondary care domains (Shi, 2012). While OPR can serve as an approach to primary health care improvement, the literature suggests OPR is most frequently conducted in hospitals. Of 43 recently identified OPR studies, five (11.6%) were conducted within primary health care settings (see Appendix 4).

To improve partnership within OPR, an OPR evaluation method (OPREM V2) was developed. The OPREM V2 is a questionnaire that assesses OPR partnerships (Hamzeh et al., 2018; Hamzeh et al., 2019). The OPREM V2 has been validated with experts, to produce an OPREM V3 (Hamzeh, Hudon, Bush, Vedel, et al., 2023). However, the OPREM V3 has not been

validated with users. It is important to validate questionnaires with users to ensure the questionnaire accurately assesses the phenomenon of interest (Messick, 1995). An OPREM validated with users from primary health care would be useful to help them engage in OPR partnership, thus improving the benefits of OPR for primary health care.

The objective of the present study was to validate the OPREM V3 with users from primary health care. The research question was: What are primary health care users' perceptions regarding the OPREM V3?

METHODS

Design

The OPREM V3 was submitted to cognitive and usability testing. To this end, stakeholders from OPR primary health care partnerships were invited to participate in digitally recorded cognitive interviews. The cognitive interview aims to evaluate the content of a questionnaire, e.g., items, by studying how participants respond to the questionnaire (Willis, 1999). In this study, users were asked to comment on OPREM V3 items for their OPR partnerships in primary health care. They were also asked to comment on the usability of the OPREM V3.

Participant selection

A key informant sample (Marshall, 1996) was used to recruit participants, i.e., participants had a unique expertise of being stakeholders within OPR partnerships in primary health care. Stakeholders from four Canadian OPR partnerships known to PP or CH were recruited.

Stakeholders were eligible to participate if they had been, or are currently, involved within an OPR partnership in primary health care.

The four OPR partnerships represented different aspects of primary health care, including clinical practice, health policy, and health promotion. More information about these partnerships may be found in Table 6.

Table 6. Description of the OPRs from which users were sampled

OPR partnership alias	**OPR partnership members**	**OPR partnership objective**
Health policy #1	Researchers from a university partner with members from a health policy organization.	To assess and improve the use of recommendations of the health policy organization.
Health policy #2	Researchers and practitioners from a health policy organization partner with researchers from outside the organization.	To summarize evidence and develop guidelines to improve organizational practice (i.e., clinical practice).
Health promotion	Researchers from a university partner with members of a health promotion organization.	To assess and improve the health information shared by the organization.
Clinical	Researchers from universities partner with patients from clinics.	To develop, implement and evaluate a clinical intervention.

Stakeholders from each partnership were contacted via email or telephone by PP, CH, or a representative from the partnership, to agree to be asked to participate. If they said yes, JM sent an official invitation email.

In this study, the intent was to interview a range of OPR stakeholders, e.g., patient-partners, organization members, and researchers. The goal of cognitive interviewing is not to generalize

findings, but to identify problems within a questionnaire with a range of potential users (Willis, 1999). The expected sample size was 15 participants, as it was thought that this was a sufficient size to capture the range of users.

Data Collection

JM conducted the interviews in English or French online (Zoom) between September 2022 and January 2023. 'Think aloud' refers to the procedure where users are asked to verbalize how they respond to a question (Willis, 1999). Users read the items, and then proceeded to verbalize issues within the content of the items, if any. For example, users commented if items were pertinent for their partnership; if not, they then suggested revisions.

Interviews were audio recorded and transcribed verbatim. To ensure that all stakeholders evaluated the same questionnaire, both anglophone and francophone participants evaluated an English version of the OPREM V3. JM took field notes after the interviews. Participants provided their informed consent prior to beginning the study. This study was approved by the McGill Institutional Review Board.

Data Analysis

Data analysis of cognitive interviews includes identifying similarities and differences among interviews (Willis, 1999). JM performed the data analysis in Excel, by grouping participants making a given comment: Similarities (if two or more participants provided the same comment), Complementarities (if two or more participants provided comments that were related to each other, yet not the same), and Differences (if only one participant provided a comment). JM asked

RN (second coder) to confirm interpretations for certain comments that JM felt required a second interpretation. JM and RN had a meeting to reach consensus on any differences in interpretation. These categories were used to justify decisions regarding the items: Revise (if needed), Eliminate, Leave item unchanged. Further, these categories were used to justify decisions regarding usability. CH reviewed and approved the final analysis.

RESULTS

A total of 17 participants completed the study. The sample consisted of two patient partners, six organization members, and nine researchers. There were between three and five participants from each of the four OPR partnerships (see Table 7).

Table 7. Number of participants from each OPR partnership

OPR partnership alias	Patient-partners	Organization members	Researchers
Health policy #1	na	2	1
Health policy #2	na	1	3
Health promotion	na	3	2
Clinical	2	na	3

The OPREM V4 (see Appendix 13) has 30 items, which represent 11 dimensions and three concepts (Trust, Sustainability and Collective learning). Trust has 14 items, sustainability has 10 items, and collective learning has six items. There are between two and five items per dimension.

The cognitive interviews resulted in the modification of 13 items, addition of two new items, and deletion of nine items.

Trust

- Supportive environment: The item Core group members consider each other's knowledge as important and valid was modified to Core group members consider each other's knowledge as important. The item There is a climate of mutual respect within the partnership, was added. The item Leaders from the organization(s) involved approve the research process, was deleted. As one participant noted:

> I understand it, but it does not hold tremendous value (doesn't evaluate trust) – because [the] world has changed a lot – [a] seal of approval doesn't earn trust. Trust to evaluate comes through processes, the two items above [Core group members consider each other's knowledge as important and valid; Core group members are at ease to express their views].

- Common understanding: The item Data ownership was modified to Intellectual property.

- Shared power: The item Putting results into practice was modified to Performing knowledge translation. As one participant noted:

> So if – I mean my only suggestion would maybe – putting results into practice makes sense in terms of for the non-academic member[s] – but maybe in terms of the academic members, for them it's like putting results into practice is like publishing.

- Strategic alignment: The item Core group members understand organizational leaders' priorities was modified to Core group members understand the priorities of the organization(s) involved. Moreover, the item The partnership's priorities fit with organizational leaders' priorities was modified to The partnership's goals fit with the priorities from the organization(s)

involved. The item The partnership research objectives relate to the priorities from the organization(s) involved, was deleted.

Sustainability

- Problem solving: The item Core group members try to solve problems when possible, was deleted. The item Conflict between core group members is dealt with openly, was deleted. The item Core group members are open to discussing problems, was added. As one participant mentioned:

> Maybe there needs to be an item . . . talking about identifying the problem, so that maybe there's a transparent process for identifying problems, or core group member[s] – there's a – they feel safe or they feel at ease enough to sort of come up with – discuss the problem – talk about the problem or identify the problem early on.

- Commitment: The item Core group members are committed to the partnership was modified to Core group members are motivated to participate in the partnership. Further, the item The time investment from core group members in the partnership is appropriate was modified to The time investment from core group members adds value to the partnership. Moreover, the item Core group members discuss the opportunity to continue their relationship after the present research project was modified to Core group members discuss the possibility to continue their relationship after the present research project.

- Partnership Cohesion: The item Core group members communicate with each other respectfully was modified to Communication among core group members adds value to the

partnership. The item Core group members can adapt to each other's needs was modified to Core group members can adapt to each other. The item Core group members are open to revising plans and timelines, was deleted. As one participant noted:

> I mean, because when I read the second point, adapt each other's needs – so a core [group] member is sick, so they can't meet this deadline so – but then that sort of – but that also is represented in the fourth item, where people are open to revising plans and timelines.

- Synergy: The item The partnership has led to new learning within my organization, was deleted.

Collective learning

- New knowledge: The item Core group members' understanding of the added value of research results for improving organizational practice was modified to Core group members' understanding of the added value of organizational participatory research for improving organizational practice. The item Core group members' awareness of their different perspectives was deleted.

- New attitudes: The question prompt 'Please indicate to what degree the partnership has increased:', was added. The item Core group members have increased their receptiveness to new ideas from each other was modified to Core group members' receptiveness to new ideas from each other. Moreover, the item Core group members have increased their receptiveness to organizational practice change was modified to Core group members' receptiveness to

organizational practice change. The item Core group members have increased their receptiveness to the idea that working together is more likely to have an impact, was deleted.

- New practices: The item Core group members have improved their ability to ask relevant organizational participatory research questions, was deleted. As one participant noted:

> I guess here, it's maybe the second one [Core group members have improved their ability to ask relevant organizational participatory research questions], is irrelevant because I'm not sure how or why it's different from the first one [Core group members have improved their capacity to undertake organizational participatory research].

The participant then explains "I think asking relevant organizational participatory research questions is part of doing organizational participatory research".

Several suggested items were excluded because they were outside the theory upon which the OPREM is based (Hamzeh, Hudon, Bush, & Pluye, 2023):

- Core group members are trained on how to work together in partnership
- Financial costs of core group members
- Conflicts of interest
- Core group members are remunerated for their work in the partnership
- Core group members respect applicable laws

- Core group members generate results that answer the OPR research question
- There is a manageable number of organization(s) involved in the partnership
- Core group members have developed tools that may be applied in future partnerships

Regarding user satisfaction with the questionnaire, several participants thought the questionnaire was short, yet comprehensive, and had appropriate language. Moreover, some participants thought the questionnaire evaluated things that are often hidden within partnerships, e.g., trust. As one participant mentioned, “I liked that it was talking about trust and working together because I think that’s often overlooked”.

Moreover, users suggested to add definitions of key terms. Thus, new definitions were added, e.g., partnership, organization, organizational priorities (see Appendix 13). Further, a few users suggested to add one page that explains the concepts of the questionnaire, and their dimensions. This change was also made. Several users also suggested to add a comment box. Thus, a comment box was added after each dimension.

Several users thought the questionnaire could be used to stimulate partnership discussions, and that questionnaire data could be used to inform partnership improvement.

While some users thought the questionnaire could be used at all points of an OPR, most users thought that items could not be assessed at any point during an OPR. Thus, an indication was provided for items that are better evaluated when some OPR results have been produced. Moreover, one participant mentioned that core group members should have a chance to talk

about how they would like to use the questionnaire, e.g., which dimensions are pertinent or not. Thus, this point was added within the introduction to the questionnaire.

DISCUSSION

Seventeen users from OPR primary health care partnerships took part in cognitive interviews to validate the OPREM V3. Interview data was used to produce the OPREM V4 (see Appendix 13), which has 30 items, representing three concepts (Trust, Sustainability and Collective learning) and 11 dimensions. Further, an introductory page, key definitions, and an overview of the concepts and dimensions, were added within the OPREM V4, to improve its usability. In this study, participants evaluated OPREM items, rather than response options, to reduce cognitive burden. Further, OPR experts previously reviewed the OPREM response options (see Acknowledgements).

As described below, the OPREM V4 is unique, because there is no previous OPR partnership questionnaire that evaluates Trust, Sustainability and Collective learning and has been validated for the primary health care context. Patient-partners, organization members, and researchers involved in OPR primary health care partnerships, took part to assist with validating the questionnaire. Thus, the OPREM V4 can be completed by all OPR partnership members in primary health care. Previous questionnaires, however, cannot be completed by all OPR partnership members in primary health care. For example, the Partnership Indicators Questionnaire (Kothari et al., 2011) can only be completed by researchers and health policy makers. Further, the Community Impacts of Research Oriented Partnerships questionnaire (King et al., 2009) can only be completed by community members.

Evaluation data from OPREM V4 can be used to improve OPR partnerships, and improved partnerships may lead to improved primary health care policy and practice. For example, this questionnaire could be implemented within the Canadian Primary Care Research Network (https://cpcrn-rcrsp.ca/), which is a network of research partnerships aimed at primary health care improvement. The OPREM could be used to assess the Trust, Sustainability and Collective learning within these OPR partnerships, and evaluation data could then inform discussions about how to improve the partnerships.

Strengths and limitations

A strength is that this study involved users from OPR partnerships representing key aspects of primary health care, i.e., clinical practice, health policy, and health promotion. Moreover, the cognitive interviews allowed participants to provide rich information concerning their views of the OPREM. Some participants mentioned they would have preferred to see the OPREM response options to better inform their evaluation of the OPREM items. Another limitation was that some participants would have preferred to review the OPREM in advance of the interview. Further, participants were interviewed in English or French; however, to ensure consistency, they were all asked to evaluate an English version of the OPREM. Even if all participants were bilingual, this could have been more difficult for the participants who spoke French as their first language.

CONCLUSION

The OPREM V4 can be used to assess and improve OPR primary health care partnerships. National and international primary health care organizations that use OPR may use OPREM data

to pinpoint areas of improvement within their OPR partnerships, and therefore improve the quality of outcomes produced from the OPR, e.g., improvements in clinical practice, health policy, and health promotion.

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COMPETING INTERESTS

There are no competing interests.

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AUTHORSHIP

JM conceptualized the study, conducted the interviews, performed data analysis and interpretation, constructed the OPREM V4, and wrote the manuscript. CH conceptualized the study, helped with recruitment, and reviewed and approved the data analysis, and revised the manuscript. RN assisted with data analysis and interpretation. PP conceptualized the study and helped with recruitment.

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CHAPTER 6 DISCUSSION

This section will be organized into four parts. First, the main findings of the three phases will be described. Second, the main findings will be compared with previous literature. Third, the contributions of the dissertation will be outlined. Fourth, further research will be suggested.

OVERVIEW OF FINDINGS

Overall, this dissertation research comprised of three phases: (a) theory development that led to an OPR partnership theory (manuscript 1); (b) validation with experts that led to an OPREM V3 which operationalizes the OPR partnership theory (manuscript 2); (c) validation with users that produced an OPREM V4 which is a refinement of the OPREM V3 because it has been validated and usability tested for the primary health care context (manuscript 3).

The OPREM V4 is the most validated and usable questionnaire version and is therefore the version that should be used to assess and improve OPR partnerships. Indeed, the OPREM V3 served as an intermediary version during the OPREM development.

Theory development (manuscript 1)

First, three main OPR partnership concepts (Trust, Sustainability and Collective learning) were defined and used in the variance theory, with findings from a recent systematic review on OPR partnership evaluation questionnaires (Hamzeh et al., 2019). Each of the partnership concepts has three to four dimensions, for a total of 11 dimensions: (a) Supportive environment; (b) Common understanding; (c) Shared power; (d) Strategic alignment; (e) Problem solving; (f)

Commitment; (g) Partnership Cohesion; (h) Synergy; (i) New Knowledge; (j) New attitudes; (k) New practices.

Second, the interrelations between partnership concepts were explained through fictitious OPR projects and predicted with three propositions, which are supported by the empirical OPR literature. The first proposition is The greater the mutual trust among members of the OPR partnership, the more sustainable the OPR partnership. The second proposition is The greater the sustainability of the OPR partnership, the more collective learning occurs within the OPR partnership. The third proposition is The greater the trust among OPR partnership members, the more collective learning occurs among them.

Third, guidance was proposed to assist evaluators in using the theory to assess OPR partnerships at any moment during an OPR. Specifically, it is suggested that evaluators use the theory to develop interview questions to evaluate an OPR partnership at the middle or end of an OPR. For example, evaluators can interview OPR partnership members during the data analysis, and implementation of findings into practice, phases of the OPR.

Validation with experts (manuscript 2)

This study content validated items that represented the concepts and dimensions of the OPR partnership theory, over a two-round e-Delphi. Findings from both rounds led to a V3 questionnaire for assessing OPR partnerships (OPREM V3). The OPREM V3 has 37 items representing 11 dimensions: (a) Supportive environment (3 items); (b) Common understanding (5 items); (c) Shared power (4 items); (d) Strategic alignment (3 items); (e) Problem solving (3

items); (f) Commitment (3 items); (g) Partnership Cohesion (4 items); (h) Synergy (3 items); (i) New Knowledge (3 items); (j) New attitudes (3 items); (k) New practices (3 items).

Validation with users (manuscript 3)

This study validated OPREM V3 items, and tested OPREM V3 usability, with users from primary health care. Findings led to a OPREM V4, which has 30 items representing 11 dimensions: (a) Supportive environment (3 items); (b) Common understanding (5 items); (c) Shared power (4 items); (d) Strategic alignment (2 items); (e) Problem solving (2 items); (f) Commitment (3 items); (g) Partnership Cohesion (3 items); (h) Synergy (2 items); (i) New Knowledge (2 items); (j) New attitudes (2 items); (k) New practices (2 items).

COMPARING THE DISSERTATION RESEARCH WITH PREVIOUS LITERATURE

Comparing the OPR partnership theory with previous process frameworks

Whetten (1989) states that the 'what', 'how' and 'why' are important descriptors of the uniqueness of a theory. Expanding upon Whetten (1989), the OPR partnership theory is unique for five reasons, as it: (a) describes OPR partnerships concepts of Trust, Sustainability and Collective learning (what); (b) adopts a variance approach (Poole, 2006) (how); (c) provides testable propositions accompanied by explanations (why); (d) evaluates OPR partnerships with any kind of partnership member (who); (e) is accompanied by practical guidance (how-to). Previous frameworks are compared with the OPR partnership theory in Table 8.

Table 8. Comparing the OPR partnership theory with previous frameworks

Authors	Trust concept	Sustainability concept	Collective learning concept	Variance orientation to evaluation	From literature and/or empirical research	Developed with stakeholders	Validated with empirical data
Bush, Pluye, et al. (2018)	YES	YES	YES	NO	YES	YES	NO
Huang et al. (2018)	YES	YES	YES	NO	YES	NO	NO
Zych et al. (2020)	YES	YES	YES	NO	YES	UN-CLEAR	NO
Malley et al. (2022)	YES	YES	YES	NO	YES	YES	NO
OPR partnership theory	YES	YES	YES	YES	YES	YES	NO

Comparing the OPREMs V3 and V4 with previous OPR literature

The OPREMs V3 and V4 contain two concepts (sustainability and collective learning), and 20 items that are not present within previous OPR reviews (see Appendix 14). This highlights the added knowledge contribution of the OPREMs V3 and V4. The OPREMs V3 and V4 complement seven partnership elements mentioned in previous OPR reviews. These elements, and their relevance for the OPREMs V3 and V4, are discussed below.

First, some OPR reviews suggested to assess OPR partnership members' competencies. That is, if partnership members are from a variety backgrounds, e.g., organization members from clinical practice and health policy domains (Oberschmidt et al., 2022), appropriate partnership members are involved in the partnership, e.g., appropriate knowledge, resources, skills (Beal, 2012), service users, e.g., patients, are partnership members (De Geest et al., 2013), and experts that provide non-research related assistance can be partnership members, e.g., information technology support (Oberschmidt et al., 2022). Evaluating competencies is outside the scope of the OPR partnership theory and the OPREMs V3 and V4, which aim to assess changes within OPR partnerships, e.g., new knowledge, attitudes and practices. Indeed, assessing competencies is related to determining which partnership members are to be involved when forming the partnership, whereas the OPR partnership theory and OPREMs follow the variance approach and assess Trust, Sustainability and Collective learning at any point after a partnership has been formed.

Second, some reviews suggested to assess if partnership evaluation has been performed. Specifically, reviews mention items about frequent partnership assessment (Beal, 2012; De Geest et al., 2013), and acknowledgement of partnership accomplishments (Beal, 2012). The overall

purpose of OPREMs V3 and V4 is partnership assessment, i.e., to evaluate trust, sustainability, and collective learning, throughout an OPR.

Third, certain reviews suggested to assess partnership management. That is, having partnership leadership (De Geest et al., 2013; Tetui et al., 2018), coordinating the partnership keeping in mind partnership members' interests and needs (De Geest et al., 2013), and having partnership members that train and guide other members (De Geest et al., 2013). In OPREMs V3 and V4, assessing if certain partnership members are designated as leaders pertains to partnership roles, which is represented by an item in the OPREMs V3 and V4.

Fourth, two reviews suggested to assess if partnership members are kept accountable (Beal, 2012; De Geest et al., 2013). OPREMs V3 and V4 help to keep partnership members accountable in the sense of how much they foster sustainability of the partnership and build trust and collective learning among themselves.

Fifth, two reviews suggested to assess if partnership members take chances, e.g., apply for competitive grants (Beal, 2012; De Geest et al., 2013). OPREMs V3 and V4 contain dimensions that imply that OPR partnership members take chances. For example, OPR partnership members take a chance when deciding to share power over the conduct of the research (i.e., it may take time to consider the viewpoints of many partnership members).

Sixth, some reviews suggested to assess if partnership members engage in regular exchange, e.g., meetings (Beal, 2012; De Geest et al., 2013; Oberschmidt et al., 2022). This item falls outside the scope of the OPR partnership theory because it relates more to the structure of the partnership, rather than Trust, Sustainability and Collective learning within the partnership.

Seventh, one review suggested to assess the maintenance of organizational improvements (Tetui et al., 2018), and another suggested to assess involving organization members who are committed to sustaining the research (Oberschmidt et al., 2022). These items are outside the scope of OPR, which is focused on improving organizational practice (rather than maintaining organizational practice improvements). Improving organizational practice is focused on implementing changes, whereas maintaining organizational practice is centered on sustaining the changes after an OPR has ended.

CONTRIBUTIONS OF THE DISSERTATION RESEARCH

Theoretical contributions

The OPR partnership theory can be refined through empirical testing. Because process frameworks describe a particular phenomenon unfolding over time, the evidence used to support these frameworks also needs to be gathered over time (Poole, 2006). This feature, therefore, makes process frameworks more difficult to generalize across many cases.

In contrast, variance theories incorporate concepts that are perpetually present during the lifespan of the phenomenon (Poole, 2006). For this reason, theories adopting a variance ontology are better suited to large-scale, cross-sectional testing. Results from such testing can be used to modify the theory, and therefore refine stakeholders' understanding on how to improve their OPR partnerships. For example, the OPR partnership theory could be used to structure mixed methods research, which could serve as a means for testing the explanations and propositions within the theory. That is, evaluators could use the theory to develop the research questions: (a) What are the relationships between Trust, Sustainability and Collective learning within OPR

partnerships? (quantitative research); (b) Why do OPR partnership members perceive that Trust, Sustainability and Collective Learning are related? (qualitative research).

Empirical contributions

Compared to existing OPR partnership questionnaires, the OPREMs V3 and V4 are content validated methods that assess Trust, Sustainability and Collective learning in OPR partnerships (see Appendix 15). The OPREMs V3 and V4 are different from the OPREM V2. The OPREM V3 has 37 items representing 11 dimensions, with three to five items per dimension. The OPREM V4 has 30 items representing 11 dimensions, with two to five items per dimension. In contrast, the OPREM V2 has 95 items representing 13 dimensions, with one to 13 items per dimension. These differences demonstrate that the OPREM V4 is a shorter and more useable questionnaire, with relevant and representative items for the concepts and dimensions assessed.

Practical contributions

The OPREM V4 can be used by OPR partnership members in the primary health care domain to assess and improve their OPR partnerships. Evaluation data produced from the OPREM V4 could be used to make improvements to the OPR partnership. For example, evaluation data from the OPREM V4 could foster discussions among partnership members at the middle of an OPR, to help partnership members determine if the partnership is on track to accomplishing its goals, i.e., learning among partnership members, and to identify ways to amplify learning, i.e., improve trust and sustainability. Evaluation data could also be used at the end of an OPR, to help partnership members determine whether the partnership accomplished its goals, and to celebrate all other successes that occurred during the partnership, i.e., extra-benefits.

FURTHER RESEARCH

The theory development followed Haynes et al. (1995) step (a) identify the construct. As described in manuscript 1, the OPR partnership concepts were refined and then reviewed by OPR experts and the relations between concepts were then explained and predicted, to produce an OPR partnership theory.

As shown in Table 8, compared to other process frameworks, the theory has a variance orientation, is based upon literature and/or empirical research, and has been developed with stakeholders. However, the theory has not been validated with empirical data. Future research can use the theory for OPR partnership evaluation, and data from these evaluations could be used to validate the theory (see Theoretical contributions).

Following Haynes et al. (1995) steps (f) assess each item, and (j) let experts assess the tool, OPR experts assessed the relevance, clarity, and representativeness of OPREM V2 items, to produce an OPREM V3. Following Haynes et al. (1995) steps (h) develop instructions, and (k) let users assess the tool, users shared their perceptions of the OPREM V3 items, and the usability of the OPREM V3, and findings were used to develop an OPREM V4.

Future research (beyond the scope of this dissertation) could validate the OPREM V4 once more with experts and users to produce an OPREM version-five (V5), thus responding to step (l) let experts and users perform another assessment of the tool within Haynes et al. (1995). The relevance of the OPREM is to be constantly checked and validated to the context. Moreover, future research could use evaluation data from OPREM V5 to test the psychometric properties of OPREM V5, thus responding to step (m) subject tool to further psychometric testing within

Haynes et al. (1995). Psychometric testing will help to determine whether the OPREM is responsive to changes in Trust, Sustainability and Collective learning in OPR partnerships. Responsiveness to change assesses if a questionnaire can measure different levels of a concept throughout time (Mokkink et al., 2010).

Further, psychometric testing can help to establish construct validity, i.e., the combination of all evidence that substantiates a claim about a questionnaire. There are six dimensions of construct validity. First, content validity assesses the extent to which the questionnaire is relevant to and representative of the construct to be measured. Substantive validity assesses the extent to which users answer the questionnaire in a manner supported by theory and data. Structural validity assesses the extent to which the scoring system of a questionnaire is supported by theory. Generalized validity assesses the extent to which claims about a questionnaire apply in different contexts. External validity assesses the extent to which a questionnaire is related to other questionnaires. Consequential validity assesses the extent to which claims made about a questionnaire lead to certain outcomes (Messick, 1995).

CHAPTER 7 CONCLUSION

This dissertation aimed to produce a theory informed questionnaire for the evaluation of OPR partnerships in health. To this end, a content validation study was conducted over three phases. In the first phase, a theory was developed to serve as the conceptual foundation of questionnaire development. In the second and third phases, a mixed method study was carried out, to validate a previous version of the questionnaire (OPREM V2), with experts (OPREM V3), and then users (OPREM V4).

The dissertation has many contributions. First, the OPR partnership theory adopts a variance approach – i.e., variation in one partnership concept causes variation in another concept – and can therefore be used to help evaluators assess and improve OPR partnerships at any point during an OPR. Second, the OPREM V4 is shorter, and more valid and useable, than previous versions of the OPREM. Third, the OPREM V4 can be used to assess and improve OPR primary health care partnerships. This is important, as improved OPR partnerships can inform greater improvements within primary health care practice. Since it is based on the OPR partnership theory, the OPREM V4 can also assess OPR partnerships at any point during an OPR.

The OPREM V4 will be disseminated to national primary health care organizations using OPR. Evaluation data from the OPREM V4 could help these organizations to strengthen their partnership. Future research can subject the OPREM V4 to further review by experts and users, and psychometric testing, e.g., construct validation.

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Zaforteza, C., Gastaldo, D., Moreno, C., Bover, A., Miró, R., & Miró, M. (2015). Transforming a conservative clinical setting: ICU nurses' strategies to improve care for patients' relatives through a participatory action research. *Nursing Inquiry*, *22*(4), 336-347. https://doi.org/10.1111/nin.12112

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APPENDICES

Appendix 1. Participatory research, research partnerships, and OPR partnerships overview with recent literature synthesis

	Partnership members			
Partnership outcomes	**Academics and practitioners**	**Academics and decision/policy-makers**	**Academics, practitioners and decision/policy-makers**	**Academics and community representatives (individuals or organization members)**
Improved knowledge	Boaz et al. (2015); Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Oberschmidt et al. (2022); Sibley et al. (2022)	Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Oberschmidt et al. (2022); Sibley et al. (2022)	Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Oberschmidt et al. (2022); Sibley et al. (2022)	Jagosh et al. (2012); Hoekstra et al. (2020); Sibley et al. (2022)
Improved attitudes	Boaz et al. (2015); Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Oberschmidt et al. (2022); Sibley et al. (2022)	Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Oberschmidt et al. (2022); Sibley et al. (2022)	Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Oberschmidt et al. (2022); Sibley et al. (2022)	Jagosh et al. (2012); Hoekstra et al. (2020); Sibley et al. (2022)
Improved skills	Boaz et al. (2015); Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Oberschmidt et al. (2022);	Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Oberschmidt et al. (2022); Sibley et al. (2022)	Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Oberschmidt et al. (2022); Sibley et al. (2022)	Jagosh et al. (2012); Hoekstra et al. (2020); Sibley et al. (2022)

	Sibley et al. (2022)			
Bridged resources	Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Sibley et al. (2022)	Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Sibley et al. (2022)	Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Sibley et al. (2022)	Drahota et al. (2016); Jagosh et al. (2012); Sibley et al. (2022)
Extended research partnership	Hoekstra et al. (2020); Lawrence et al. (2019)	Hoekstra et al. (2020); Lawrence et al. (2019)	Hoekstra et al. (2020); Lawrence et al. (2019)	Drahota et al. (2016); Jagosh et al. (2012); Hoekstra et al. (2020)
Improved research	Improved relevance of evidence: Boaz et al. (2015); Hoekstra et al. (2020); Lawrence et al. (2019) Improved internal validity of research: Hoekstra et al. (2020); Lawrence et al. (2019) Spin-off projects: Hoekstra et al. (2020); Lawrence et al. (2019)	Improved relevance of evidence: Hoekstra et al. (2020); Lawrence et al. (2019) Improved internal validity of research: Hoekstra et al. (2020); Lawrence et al. (2019) Spin-off projects: Hoekstra et al. (2020); Lawrence et al. (2019)	Improved relevance of evidence: Hoekstra et al. (2020); Lawrence et al. (2019) Improved internal validity of research: Hoekstra et al. (2020); Lawrence et al. (2019) Spin-off projects: Hoekstra et al. (2020); Lawrence et al. (2019)	Improved relevance of evidence: Hoekstra et al. (2020); Jagosh et al. (2012) Improved internal validity of research: Hoekstra et al. (2020); Jagosh et al. (2012) Spin-off projects: Hoekstra et al. (2020); Jagosh et al. (2012)
Improved healthcare	Improved health policy: Hoekstra et al. (2020); Lawrence et al. (2019)	Improved health policy: Hoekstra et al. (2020); Lawrence et al. (2019)	Improved health policy: Hoekstra et al. (2020); Lawrence et al. (2019)	Improved organizational practice: Drahota et al. (2016); Hoekstra et al. (2020)

	Improved organizational practice: Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Lawrence et al. (2019) Organizational capacity building: Bush, Pluye, et al. (2017); Hoekstra et al. (2020)	Improved organizational practice: Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Lawrence et al. (2019) Organizational capacity building: Bush, Pluye, et al. (2017); Hoekstra et al. (2020)	Improved organizational practice: Bush, Pluye, et al. (2017); Hoekstra et al. (2020); Lawrence et al. (2019) Organizational capacity building: Bush, Pluye, et al. (2017); Hoekstra et al. (2020)	
Improved health	Hoekstra et al. (2020)	Hoekstra et al. (2020)	Hoekstra et al. (2020)	Hoekstra et al. (2020)
Empowered communities	Hoekstra et al. (2020)	Hoekstra et al. (2020)	Hoekstra et al. (2020)	Drahota et al. (2016); Jagosh et al. (2012); Hoekstra et al. (2020)
Research ownership	Hoekstra et al. (2020); Lawrence et al. (2019)	Hoekstra et al. (2020); Lawrence et al. (2019)	Hoekstra et al. (2020); Lawrence et al. (2019)	Jagosh et al. (2012); Hoekstra et al. (2020)

Boaz, A., Hanney, S., Jones, T., & Soper, B. (2015). Does the engagement of clinicians and organisations in research improve healthcare performance: a three-stage review. *BMJ Open*, *5*(12), Article e009415. https://doi.org/10.1136/bmjopen-2015-009415

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Hoekstra, F., Mrklas, K. J., Khan, M., McKay, R. C., Vis-Dunbar, M., Sibley, K. M., Nguyen, T., Graham, I. D., Anderson, K., Anton, H., Athanasopoulos, P., Chernesky, J., Forwell, S., Maffin, J., Martin Ginis, K., McBride, C. B., Mortenson, B., Willms, R., SCI Guiding Principles Consensus Panel, & Gainforth, H. L. (2020). A review of reviews on principles, strategies, outcomes and impacts of research partnerships approaches: a first step in synthesising the research partnership literature. *Health Research Policy and Systems*, *18*, Article 51. https://doi.org/10.1186/s12961-020-0544-9

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Sibley, K. M., Hoekstra, F., Kothari, A., & Mrklas, K. (2022). Effects, Facilitators, and Barriers of Research Coproduction Reported in Peer-Reviewed Literature. In I. D. Graham, J. Rycroft-Malone, A. Kothari, & C. McCutcheon (Eds.), *Research Co-Production in Healthcare* (pp. 54-73). John Wiley & Sons Limited. https://doi.org/https://doi.org/10.1002/9781119757269.ch4

Appendix 2. OPR partnership literature reviews

Partnership elements	Review
Partnership leadership	De Geest et al. (2013); Tetui et al. (2018)
Feeling appreciated	Beal (2012); De Geest et al. (2013)
Trust and respect	Beal (2012); De Geest et al. (2013)
Freedom to express oneself	Tetui et al. (2018)
Involving service users, e.g., patients, in the partnership	De Geest et al. (2013)
Integration of competencies	De Geest et al. (2013)
Democratization of research governance	De Geest et al. (2013); Oberschmidt et al. (2022)
Advantages for all partnership members, e.g., co-authorship on publications	De Geest et al. (2013)
Assistance from the organization(s), e.g., administrative staff	Beal (2012); De Geest et al. (2013); Tetui et al. (2018)
Variety of partnership member backgrounds, e.g., organization members from clinical practice and health policy domains	Oberschmidt et al. (2022)
Appropriate partnership members, e.g., appropriate knowledge, resources, skills	Beal (2012)
Unified purpose	Beal (2012); De Geest et al. (2013); Tetui et al. (2018)
Regular exchange, e.g., meetings	Beal (2012); De Geest et al. (2013); Oberschmidt et al. (2022)
Formal partnership agreements	Beal (2012)
Partnership member roles	De Geest et al. (2013); Oberschmidt et al. (2022)
Partnership timelines	De Geest et al. (2013)
Accountability of partnership members	Beal (2012); De Geest et al. (2013)
Adapting partnership plans as needed	De Geest et al. (2013)
Commitment	Beal (2012); De Geest et al. (2013)
Sufficient time and resources	Beal (2012); De Geest et al. (2013)
Research ownership	Lawrence et al. (2019)
Conflict resolution	Lawrence et al. (2019)
Planning, e.g., maintaining organizational improvements	De Geest et al. (2013)

Implementation and maintenance of organizational improvements	Tetui et al. (2018)
Dissemination and application of evidence	Lawrence et al. (2019)
Expansion of research partnerships from one project to another	Lawrence et al. (2019)
Organization members who want to sustain the research	Oberschmidt et al. (2022)
Training and guiding partnership members	De Geest et al. (2013)
Coordinating the partnership keeping in mind partnership members' interests and needs	De Geest et al. (2013)
Taking chances, e.g., applying for competitive grants	Beal (2012); De Geest et al. (2013)
Experts that provide non-research related assistance, e.g., information technology support	Oberschmidt et al. (2022)
Teamwork among partnership members	De Geest et al. (2013)
Putting resources towards building interpersonal bonds	Oberschmidt et al. (2022)
Being flexible, e.g., modifying timelines	Oberschmidt et al. (2022)
Acknowledgement of partnership accomplishments	Beal (2012)
Organizationally appropriate research	Boaz et al. (2015); Lawrence et al. (2019)
New knowledge, attitudes, and practices among organization members	Boaz et al. (2015); Oberschmidt et al. (2022)
Partnership members' understanding of each other's practice	Oberschmidt et al. (2022)
Frequent partnership assessment	Beal (2012); De Geest et al. (2013)

Beal, J. A. (2012). Academic-service partnerships in nursing: an integrative review. *Nursing Research and Practice*, *2012*, Article 501564. https://doi.org/10.1155/2012/501564

Boaz, A., Hanney, S., Jones, T., & Soper, B. (2015). Does the engagement of clinicians and organisations in research improve healthcare performance: a three-stage review. *BMJ Open*, *5*(12), Article e009415. https://doi.org/10.1136/bmjopen-2015-009415

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Oberschmidt, K., Grünloh, C., Nijboer, F., & van Velsen, L. (2022). Best Practices and Lessons Learned for Action Research in eHealth Design and Implementation: Literature Review. *Journal of Medical Internet Research*, *24*(1), Article e31795. https://doi.org/10.2196/31795

Tetui, M., Zulu, J. M., Hurtig, A.-K., Ekirapa-Kiracho, E., Kiwanuka, S. N., & Coe, A.-B. (2018). Elements for harnessing participatory action research to strengthen health managers' capacity: a critical interpretative synthesis. *Health Research Policy and Systems*, *16*, Article 33. https://doi.org/10.1186/s12961-018-0306-0

Appendix 3. Search string for OPR studies

(TITLE ((action W/2 research) OR "action-research" OR "research-action" OR "translational research" OR (participatory W/2 research) OR "participatory approach" OR "appreciative inquiry" OR "practice-research engagement" OR "collaborative partnership")) AND (TITLE (healthcare OR (health PRE/2 (care OR service OR professional OR worker OR practitioner)) OR (care W/2 (unit OR team OR provision OR delivery OR model OR facility OR setting OR center OR coordination OR continuing OR primary OR program OR professional)) OR (clinical PRE/2 (practice OR unit OR work OR supervision OR training)) OR patient OR nurse OR physician OR hospital OR ward OR pharmacy OR emergency OR medical)) AND (TITLE (((evaluation OR consultation OR apprais*) AND process) OR ((management OR implementation) AND change) OR ((management OR transformative) AND research) OR ("community of practice") OR ("organisational learning") OR ("organizational learning") OR ("transformational change")) AND (LIMIT-TO (SUBJAREA , "medi") OR LIMIT-TO (SUBJAREA , "nurs") OR LIMIT-TO (SUBJAREA , "soci") OR LIMIT-TO (SUBJAREA , "heal") OR LIMIT-TO (SUBJAREA , "psyc")) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015))

Appendix 4. OPR studies from 2015-2023

Author, year	Country	Type of organization	Practice (question/topic)	Trust, Sustainability, Collective learning	Partnership evaluation as part of results
Fox et al., 2023	Australia	Hospital	Compassion fatigue	Multidisciplinary (collective learning)	yes
Hahn-Goldberg et al., 2022	Canada	Hospital (transition)	Medication	na	na
Karam et al., 2022	Belgium	Primary care	Communication between GPs and nurses	na	na
Harorani et al., 2022	Iran	Hospital	Spiritual care	nurses, patients, researchers (collective learning)	na
van de Ven et al., 2022	UK	Clinic	clinical guidelines	multidisiciplinary (sustainability)	na
Fusi-Schmidhauser et al., 2021	Switzerland	Palliative care	COPD management	na	na
Vizeshfar et al., 2021	Iran	Health center	address challenges of health volunteers	Health volunteers (collective learning)	yes
Bakhshi et al., 2021	unclear	emergency department	medication management	Multidisciplinary (trust, sustainability, collective learning)	yes
Shabani et al., 2021	Iran	hospital	discharge planning	Multidiscipinary (trust, sustainability)	na
Phelan et al., 2021	Ireland	patient organization	person centred care	na	na
Mash et al., 2021	South Africa	primary care	organizational culture	multidisciplinary (sustainability, collective learning)	na
Steensgaard et al., 2021	Denmark	rehabiliation centre	patient participation in care	nurses and nursing assitants (trust, collective learning)	na
Haesebaert et al., 2020	Canada	primary care	evaluation	mutlidisciplinary (trust, sustainability, collective learning)	yes
Krieger et al., 2020	Germany	hospital	family caregiving	multidisciplinary (trust, sustainability, collective learning)	yes
Lette et al., 2020	Netherlands	integrated care	interprofessional collaboration	multidisiciplinary (trust, sustainability, collective learning)	yes
Lee et al., 2019	Taiwan	long term care	advanced care planning	na	na
Bender et al., 2019	United States	health system	clincial nurse leadership	na	na
Bull et al., 2019	UK	health and social care organizations	care practices	multidisciplinary (trust, sustainability, collective learning)	Yes
Mattukat et al., 2019	Germany	patient organization	patient participation in care	na	na
Schwarz et al., 2019	Germany	rehabiliation centre	work related medical rehabilitation	na	na
Dobrina et al., 2018	Italy	palliative care	patient centred care	multidisciplinary (sustainability)	na
Cusack et al., 2018	Canada	public health	professional practice framework	nurses (trust, commitment, collective learning)	yes
Ospina-Pinillos et al., 2018	Australia	mental health foundation	online mental health services	na	na
Elliott et al., 2017	Australia	home nursing service	pharmacy support	multidisciplinary (trust, sustainability, collective learning)	na
Broom et al., 2017	Australia	neonatal care	redesign neonatal unit	Multidisciplinary (trust, sustainability, collective learning)	yes
Sarvestani et al., 2017	Iran	pediatric care	nursing handover of patient information	multidisciplinary (trust, sustainability, collective learning)	yes
Battistella et al., 2017	Italy	Hospital	hand hygiene	na	na
Öhlén et al., 2016	Sweden	Palliative care	person centred communication	na	na
Paltved et al., 2016	Denmark	surgical ward	interprofessional team performance	multidisciplinary (trust, sustainability, collective learning)	yes
Zaforteza et al., 2015	Spain	hospital	care for patients' families	multidisciplinary (trust, collective learning)	yes
Taylor et al., 2015 (a)	UK	community health centres	telehealth adoption	multidisciplinary (sustainability, collective learning)	yes
Taylor et al., 2015 (b)	Australia	hospital	emotional intelligence	nurse managers (trust, sustainability, collective learning)	na
Pasquier 2015	France	hospital	announcement system	nurses (collective learning)	na
Khorasani et al., 2015	Iran	hospital	patient education	mutlidisciplinary (trust, sustainability, collective learning)	yes
Found from citations of Bush et al., 2017/2018					
Leon-Arce et al., 2022	Colombia	public health	clinical coordination	multidisciplinary (trust, sustainability, collective learning)	yes
Moreno-Poyato et al., 2022	Spain	mental health	nurse-patient relationship	na	na
Weckström et al., 2022	Finland	early childhood education and care	participation in care	multidisciplinary (trust, sustainability, collective learning)	na
Vazquez et al., 2022	Brazil, Chile, Colombia, Mexico, Uruguay	multiple care levels	clinical coordination	multidisciplinary (collective learning)	yes
Loban et al., 2021	Canada	primary care	services to vulnerable populations	multidisciplinary (trust, sustainability, collective learning)	yes
Minaya-Freire et al., 2020	Spain	hospital	pain management	nurses (sustainability)	na
Vargas et al., 2020 (a)	Brazil, Chile, Colombia, Mexico, Uruguay	multiple care levels	clinical coordination	multidisciplinary (trust, sustainability, collective learning)	yes
Vargas et al., 2020 (b)	Brazil, Chile, Colombia, Mexico, Uruguay	multiple care levels	clinical coordination	multidisciplinary (trust, sustainability, collective learning)	yes
Pluye et al., 2020	Canada	philanthropic	web based parenting information	na	na
Plunger et al., 2020	Austria	community pharmacies	person centred care	multidisciplinary (trust, sustainability, collective learning)	yes
Luc et al., 2019	Canada	primary care	advanced access	na	na
Laur et al., 2018	Canada	hospital	nutrition	multidisciplinary (trust, sustainability, collective learning)	yes

Bakhshi, F., Mitchell, R., Nasrabadi, A. N., Javadi, M., & Varaei, S. (2021). Clinician attitude towards safety in medication management: a participatory action research study in an emergency department. *BMJ Open*, *11*(9), Article e047089. https://doi.org/10.1136/bmjopen-2020-047089

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Appendix 5. Methodology of the dissertation research

Study Design: Content Validation

This study will follow a content validation design (Haynes et al., 1995), which is supported by modern global benchmarks in psychometric assessment (American Educational Research Association (AERA) et al., 2014). Haynes et al. (1995) propose several steps for questionnaire content validation: (a) identify the construct, (b) identify the purpose of the tool, (c) choose which type of tool, (d) develop items, (e) organize items into dimensions, (f) assess each item, (g) choose response options, (h) develop instructions, (i) develop stimuli, (j) let experts assess the tool, (k) let users assess the tool, (l) let experts and users perform another assessment of the tool, and (m) conduct psychometric testing. In this dissertation, the following hierarchy is adopted: construct (main phenomenon to be measured), concept (specific feature of a construct), dimension (specific feature of a concept), and item (question).

Steps already completed from Haynes et al., (1995)

Steps (a) to (e) have already been completed by developing OPREM V2.

Step (a) – identify the construct: The construct has been specified as OPR partnership. The full list of dimensions measured by OPREM V2 are specified in the *Background*.

Step (b) – identify the purpose of the tool: the OPREM V2 allows OPR stakeholders to assess their OPR partnerships (Hamzeh et al., 2018). Assessment results could be used by OPR stakeholders to determine which areas of the partnership need to be improved (Hamzeh et al., 2018).

Step (c) – choose the type of tool: The OPREM V2 is a *self-reported questionnaire*.

Step (d) – develop items: The dimensions and items of the OPREM V2 were developed from previous OPR partnership questionnaires identified from a systematic review (Hamzeh et al., 2019), input from OPR content experts and stakeholders, frameworks on participatory research (Bush, Pluye, et al., 2018; Cargo & Mercer, 2008; Jagosh et al., 2015; Jagosh et al., 2012), and empirical work (Jagosh et al., 2015).

Step (e) – organize items into dimensions: As mentioned previously, OPREM V2 items are organized into OPR partnership dimensions, and these dimensions are organized into OPR partnership concepts.

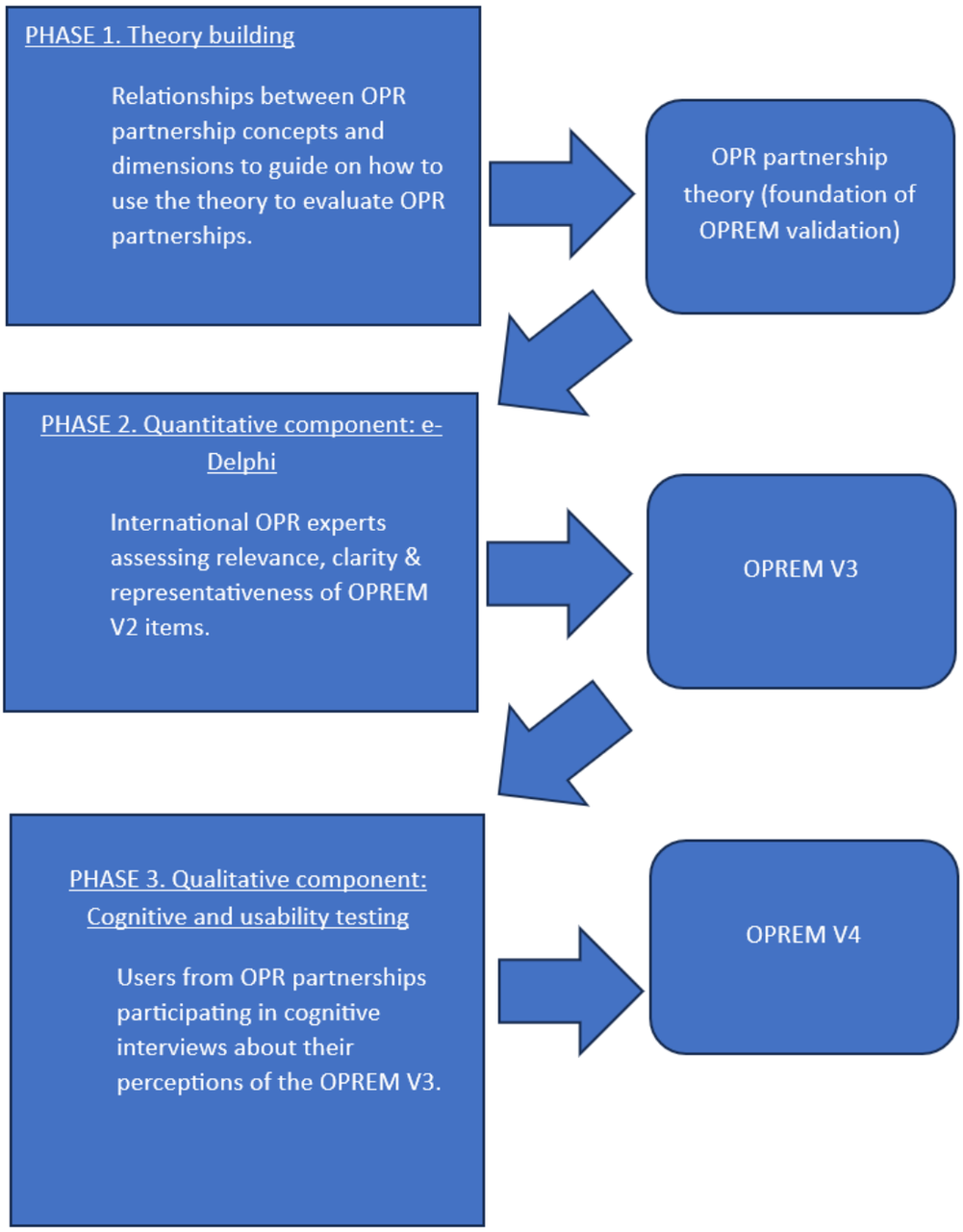
As described in further sections, steps f-k will be completed using a three-phase content validation study: theory development (phase 1) and a mixed methods study (phases 2, an e-Delphi, and 3, cognitive and usability testing). Below is a summary about where these steps occur in the dissertation. In Haynes et al. (1995), steps (l) let experts and users perform another assessment of the tool, and (m) conduct psychometric testing, will be performed in future research outside the dissertation. Please note that according to Haynes et al. (1995), step (i) develop stimuli, e.g., sound, is not pertinent for questionnaires.

Steps of Haynes et al. (1995)	**MSc: Systematic review with framework synthesis**	**PhD: Content validation study**
a- identify the construct	The OPREM assesses OPR partnerships.	Phase 1 (Theory development): The theory building steps by Whetten (2002) were followed to explain and predict relationships between OPR partnership concepts and dimensions.
b- identify the purpose of the tool	The OPREM assesses and improves OPR partnerships.	
c- choose the type of tool	The OPREM is a self-reported questionnaire.	
d- develop items	OPREM dimensions and items derive from previous OPR questionnaires, expert and stakeholder input, participatory research frameworks, and empirical literature.	
e- organize items into dimensions	OPREM items are represented by dimensions.	
f- assess each item		See step j.
g- choose response options		OPREM response options were developed with my dissertation committee.
h- develop instructions		Instructions are provided within the OPREM.
i- develop stimuli		Na
j- let experts assess the tool		Phase 2 (Validation with experts): An e-Delphi was used in which OPR experts reviewed the relevance, clarity and representativeness of

		OPREM V2 items, to produce an OPREM V3.
k- let users assess the tool		Phase 3 (Validation with users): In cognitive and usability testing, users were asked about their perceptions of the OPREM V3 items, for their context. They were also asked about the usability of V3, for their context. Results led to an OPREM V4.
l- let experts and users perform another assessment of the tool		Outside the scope of this thesis.
m- conduct psychometric testing		Outside the scope of this thesis.

Overall design and design justification

This 3-phase project will begin with further development of the OPR partnership concepts and dimensions (theory development process [phase 1]) and finish with a mixed methods study (e-Delphi [phase 2] and cognitive and usability testing [phase 3]). For phases 2 and 3, the mixed methods approach was chosen to: 1) quantitatively rank the relevance of OPREM V2 items with experts, to produce an OPREM V3 (e-Delphi); and 3) qualitatively explore users' perceptions of the OPREM V3, to produce an OPREM V4 (cognitive and usability testing). Integration will occur at the level of data collection (Pluye et al., 2018). That is, quantitative phase results will inform qualitative phase data collection, i.e., OPREM V3 items post the e-Delphi will be explored from users' perspectives during cognitive and usability testing. Details of this project are provided below.



Regarding phase 3, it is important to note that Messick (1995) states:

> The extent to which score meaning and action implications hold across persons or population groups and across settings or contexts is a persistent and perennial empirical question. This is the main reason that validity is an evolving property and validation a continuing process. (p. 741)

Therefore, Messick (1995) implies that the validity of assessments depends upon contextual factors. These contextual factors are explained in manuscript 3 (cognitive and usability testing).

Epistemological position: Pragmatism

I will adopt a pragmatic worldview for several reasons. First, the pragmatic worldview advocates for theories that can be concretely applied within practice (Johnson & Onwuegbuzie, 2004) – e.g., the OPR partnership theory may be used to structure the evaluation of OPR partnerships in practice. Pragmatism also applies to theory building. That is, one can imagine the outcomes that could hypothetically occur when increasing or decreasing certain variables (Johnson & Onwuegbuzie, 2004). Second, within the context of mixed methods research, pragmatism assumes that understanding a phenomenon should occur by using the most relevant and useful methods (Johnson & Onwuegbuzie, 2004). In the present dissertation, I adopt a theory building and mixed methods approach for questionnaire validation. Third, the pragmatic worldview recognizes that pluralism is important (Johnson & Onwuegbuzie, 2004). Therefore, this dissertation research takes a pluralistic stance because the perspectives of various types of OPR stakeholders are considered within the validation process. In phases 2 and 3, a range of OPR experts and questionnaire users, respectively, were involved. Finally, the pragmatic worldview recognizes that our understanding of reality is constantly shifting (Johnson & Onwuegbuzie, 2004) – e.g., validation is ongoing and dependent on context (Messick, 1995). In phase 3, cognitive and usability testing was undertaken to explore users' perception of the OPREM V3 for their context.

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Appendix 6. Comparing our theory with existing frameworks related to participatory research in the health domain

Author	**What: describes OPR partnership concepts of Trust, Sustainability and Collective learning**	**Who: evaluates partnerships containing all types of partnership members**	**How: uses a variance approach (Poole, 2006)**	**Why: provides testable propositions accompanied by explanations**	**How-to: accompanied by practical guidance for evaluators**
Malley et al. (2022)	Trust, Sustainability, Collective learning	No	No	No	No
Zych et al. (2020)	Trust, Sustainability, Collective learning	Yes	No	No	No
Bush, Pluye, et al. (2018)	Trust, Sustainability, Collective learning	Yes	No	No	Yes – in separate publication by Bush, Tremblay, et al. (2017)
Huang et al. (2018)	Trust, Sustainability, Collective learning	No	No	No	No
Our OPR partnership variance theory	Trust, Sustainability, Collective learning	Yes	Yes	Yes	Yes

Bush, P. L., Pluye, P., Loignon, C., Granikov, V., Wright, M. T., Repchinsky, C., Haggerty, J., Bartlett, G., Parry, S., Pelletier, J.-F., & Macaulay, A. C. (2018). A systematic mixed studies review on Organizational Participatory Research: towards operational guidance. *BMC Health Services Research*, *18*(1), Article 992. https://doi.org/10.1186/s12913-018-3775-5

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Appendix 7. Definitions of OPR partnership concepts and dimensions

Concepts and dimensions	Definition from Hamzeh et al. (2019)	Revised according to Wacker (2004) rules 3, 4, 7 and revised to reframe in variance form (Poole, 2006)
CONCEPT 1: TRUST	The degree to which core group members from the health organization(s) and academic institution(s) feel that the partnership provides a supportive environment, a common understanding of the research, shared power, and a research strategy aligned with the missions, values or strategic plans of the health organization(s) and academic institution(s).	The degree to which academics and non-academics perceive the partnership as providing a supportive environment, a common understanding of the research, shared power, and a research strategy aligned with the missions, values or plans of the health organization(s). Notes: - replaced 'core group member' (too vague) with 'academics and non-academics' (more specific): **this note will not be repeated** as this replacement has been done throughout all constructs and dimensions; - removed 'academic institution(s)' at the end of definition, as the focus of the research strategy should be on the health organization.
Dimension 1.1: Supportive Environment	The degree to which core group members value each other's contributions towards the organizational partnership, are at ease in expressing points of view and in asking for help, feel support from organizational leaders (i.e., decision-makers governing organizational practices), and support, inspire, motivate, and guide other core groups members.	The degree to which academics and non-academics perceive they are valued. Note: removed connective term 'and', since a good definition is a clear, concise expression of a unique concept.
Dimension 1.2: Common Understanding	The degree to which core group members have the same understanding of information and understand what is at stake for each other and their organizations; this involves discussion, documentation and approval of key partnership items, e.g., partnership objectives, roles, responsibilities, expectations, needs, deliverables	The degree to which academics and non-academics have developed a formal partnership agreement (along a continuum from no discussion to a detailed written contract). Notes: - removed connective term 'and' (also symbolized by ";"), since a good definition is a clear, concise expression of a unique concept; - did not mention partnership objectives, roles, responsibilities, expectations, needs, deliverables, which all relate to items established within a formal agreement.
Dimension 1.3: Shared Power	The degree to which the organizational partnership has equal distribution of decision- making authority among core group	The degree to which academics and non-academics have equal authority in making decisions about the research.

	members from the health organization(s) and academic institutions(s) throughout all phases of the research	Note: replaced 'equal distribution of decision-making authority among… throughout all phases of the research' (too lengthy) with 'equal authority in making decisions about the research' (clearer and more concise).
Dimension 1.4: Strategic Alignment	The degree to which findings are applicable to organizational partners; materials presented to the organizations are written in terms understood by the organization; strategies implemented by the partnership are tailored to the organizations.	The degree to which academics and non-academics conduct research that is relevant to the organization (including the application of results). Note: removed connective term 'and' (";") since a good definition is a clear, concise expression of a unique concept: applicable findings, written materials, and partnership strategies, all relate to organizational relevance.
CONCEPT 2: SUSTAINABILITY	The degree to which core group members from the health organization(s) and academic institution(s) are committed to pursue the research endeavor and to keep the partnership alive after research has finished, are effectively mixing their organizational perspectives, skills and experiences to foster organizational improvement, are utilizing effective allocation of resources (e.g., budget renewal) to ensure the sustainability of the research partnership to bring about organizational improvement, and are working in a synergistic manner to maintain the partnership and support the integration of findings into ongoing practice.	The degree to which academics and non-academics are committed to each other, experience partnership cohesion, engage in problem solving, and work in a synergistic manner. Notes: - removed "utilizing effective allocation of resources (e.g., budget renewal) …" as closely relates to "commitment"; - condensed "committed to pursue the research endeavor and to keep the partnership alive after research has finished" into "committed to each other"; - condensed "effectively mixing their organizational perspectives, skills and experiences to foster organizational improvement" into "experience partnership cohesion"; - condensed "synergistic manner to maintain the partnership and support the integration of findings into ongoing practice" into "synergistic manner"; - added dimension "problem solving" (moved from collective learning, since it serves as an antecedent for learning rather than a dimension of learning).
Dimension 2.1: Commitment	The degree to which core group members are dedicated to sustaining the research project within the health organization(s), have discussed the continuation of their organizational relationship post completion of the research project, and feel empowered because of participation in the research project;	The degree to which academics and non-academics are invested in their partnership. Notes: - removed connective term 'and', since a good definition is a clear, concise expression of a unique concept. Sustaining the research and continuing the partnership post research project completion, was merged into invested in their partnership; - removed "feeling empowered…" as this is an outcome of commitment.

Dimension 2.2: Partnership Cohesion	The degree to which core group members represent organizational partnership members who have an interest in the research outcomes, have their organizational perspectives, skills, and experiences combined for the improvement of organizational practice, perceive relationships between themselves as strong, have developed a team mentality, communicate openly with each other, and have mutual respect;	The degree to which academics and non-academics are unified while working on the research. Notes: - removed "have their organizational perspectives, skills, and experiences combined for the improvement of organizational practice" as it relates to another dimension (synergy); - removed "mutual respect" as it relates to another dimension (supportive environment); - removed connective term 'and', since a good definition is a clear, concise expression of a unique concept: representation of organizational partnership members, strong relationships, team mentality, and open communication, all relate to unification.
Dimension 2.3: Problem Solving	The degree to which core group members feel able to overcome conflicts related to the research endeavor (e.g., conflicting organizational interests towards research objective), learn how to implement innovative problem-solving solutions and facilitate the removal of barriers from each other's work	The degree to which academics and non-academics settle difficulties. Note: overcoming research related conflicts, learning how to solve problems and helping to remove barriers to work, all relate to settling difficulties.
Dimension 2.4: Synergy	The degree to which core group members maintained connection with contacts (i.e., those consulted for aid or advice) over the partnership lifespan, have initiated extra projects (e.g., new projects and learnings) within their organizations have increased their alignment of organizational knowledge, skills and resources, have been introduced to new organizational, professional or research networks and have integrated the partnership work with other organizations.	The degree to which academics' and non-academics' perceived benefits of the partnership are greater than the potential benefits of a similar research project without partnership (synergistic partnerships' benefits being increased knowledge, skills, and resources – surpassing partnerships' drawbacks such as time investment). Notes: - removed maintaining contacts which is more akin to another dimension (commitment); - removed introduction to new networks, integration with other organizations, and developing new projects, which are more akin to another construct (collective learning).
CONCEPT 3: COLLECTIVE LEARNING	The degree to which core group members from the health organization(s) and academic institution(s) feel they and their respective organizations have developed new knowledge, attitudes, and practices through the partnership, and have	The degree to which academics and non-academics perceive that they have developed new knowledge, attitudes, and practices. Notes:

	effectively solved problems and conflicts related to the research endeavor	- removed problem solving and placed as a separate dimension akin to another construct (sustainability), since it serves as an antecedent for learning. - removed "and their respective organizations" because the focus is on partnership members, rather than the organization(s).
Dimension 3.1: New Knowledge	The degree to which core group members feel they have an increased awareness, understanding or knowledge surrounding a topic pertaining to professional or research practice, the research process in general, or their organizations' needs	The degree to which academics and non-academics perceive that they have developed a better consciousness of their practice. Note: focused the definition to new knowledge gained from partnership members, rather than assessing new knowledge at the organization level.
Dimension 3.2: New Attitudes	The degree to which core group members feel they have an increased receptiveness to new ideas about members of their organization, the research team, and the research process in general, and the degree to which their organizations value evidence and can confidently implement evidence into practice	The degree to which academics and non-academics perceive they have renewed their feelings about their own professional practice and routines, and the organization overall (e.g., their perception regarding how the health organization(s) value(s) scientific evidence and its application in practice). Note: focused the definition to new attitudes gained from partnership members, rather than assessing new attitudes at the organization level (as attitudes pertain to individuals and not organizations).
Dimension 3.3: New Practices	The degree to which core group members feel they have an increased ability to undertake research independently or collaboratively and perform their daily or professional tasks, and the degree to which their organizations have improved professional development, advocacy efforts and organizational information resources (e.g., websites)	The degree to which academics and non-academics perceive that they have acquired new practices (including the improvement of current practices). Note: focused the definition to new practices gained from partnership members, rather than assessing new practices at the organization level.

Hamzeh, J., Pluye, P., Bush, P. L., Ruchon, C., Vedel, I., & Hudon, C. (2019). Towards an assessment for organizational participatory research health partnerships: A systematic mixed studies review with framework synthesis. *Evaluation and program planning*, *73*, 116-128. https://doi.org/https://doi.org/10.1016/j.evalprogplan.2018.12.003

Poole, M. S. (2006). *Building Process Theories* [PowerPoint slides]. IDEALS. http://hdl.handle.net/2142/232

Wacker, J. G. (2004). A theory of formal conceptual definitions: developing theory-building measurement instruments. *Journal of Operations Management*, *22*(6), 629-650. https://doi.org/https://doi.org/10.1016/j.jom.2004.08.002

Appendix 8. Development of the theory

Recommendation from Whetten (2002)	Application
Determine the concepts	The construct is partnership within organizational participatory research (OPR) – that is, a partnership between researchers and members of health organizations, aimed at organizational learning (Argyris et al., 1985; Waterman et al., 2001). The authors performed a systematic review of OPR partnership questionnaires (Hamzeh et al., 2019), to produce concepts, dimensions and items that assess OPR partnerships, using the framework synthesis method (Booth & Carroll, 2015; Carroll et al., 2011; Carroll et al., 2013).
Determine the connections between the concepts	The relationships between concepts (propositions) were then developed by the authors, and explanations for these propositions were crafted using fictitious scenarios. The empirical OPR literature was used to support the propositions.
Describe assumptions	The theory adopts four assumptions: 1. A focus on OPR partnership concepts, and one forward cycle of OPR (e.g., one OPR project rather than an OPR program with multiple projects). 2. A variance epistemology – that is, the view that an increase in one concept will lead to an increase in another concept (Poole, 2006). Thus, the theory can be evaluated at any time during the lifespan of an OPR partnership. As such it aims to help evaluators track OPR partnership improvement. 3. A focus on OPR partnerships within the health domain. That said, the theory has a scope that makes it generalizable for OPR partnerships across: (a) evaluation traditions, e.g., a community of practice that incorporates OPR; (b) health disciplines, e.g., OPR partnerships designed to improve clinical practice, health policies; or (c) disciplines outside health, e.g., OPR partnerships in social services, education, and organizational behavior. 4. A focus on OPR partnerships that involve any type of OPR partnership member, e.g., patient, clinician, policymaker.

Argyris, C., Putnam, R., & Smith, D. M. (1985). *Action Science: Promoting Learning for Action and Change*. Jossey-Bass. https://actiondesign.com/resources/readings/action-science

Booth, A., & Carroll, C. (2015). How to build up the actionable knowledge base: the role of 'best fit' framework synthesis for studies of improvement in healthcare. *BMJ Quality & Safety*, *24*(11), 700-708. https://doi.org/10.1136/bmjqs-2014-003642

Carroll, C., Booth, A., & Cooper, K. (2011). A worked example of "best fit" framework synthesis: A systematic review of views concerning the taking of some potential

chemopreventive agents. *BMC medical research methodology*, *11*, Article 29. https://doi.org/10.1186/1471-2288-11-29

Carroll, C., Booth, A., Leaviss, J., & Rick, J. (2013). “Best fit” framework synthesis: refining the method. *BMC medical research methodology*, *13*, Article 37. https://doi.org/10.1186/1471-2288-13-37

Hamzeh, J., Pluye, P., Bush, P. L., Ruchon, C., Vedel, I., & Hudon, C. (2019). Towards an assessment for organizational participatory research health partnerships: A systematic mixed studies review with framework synthesis. *Evaluation and program planning*, *73*, 116-128. https://doi.org/https://doi.org/10.1016/j.evalprogplan.2018.12.003

Poole, M. S. (2006). *Building Process Theories* [PowerPoint slides]. IDEALS. http://hdl.handle.net/2142/232

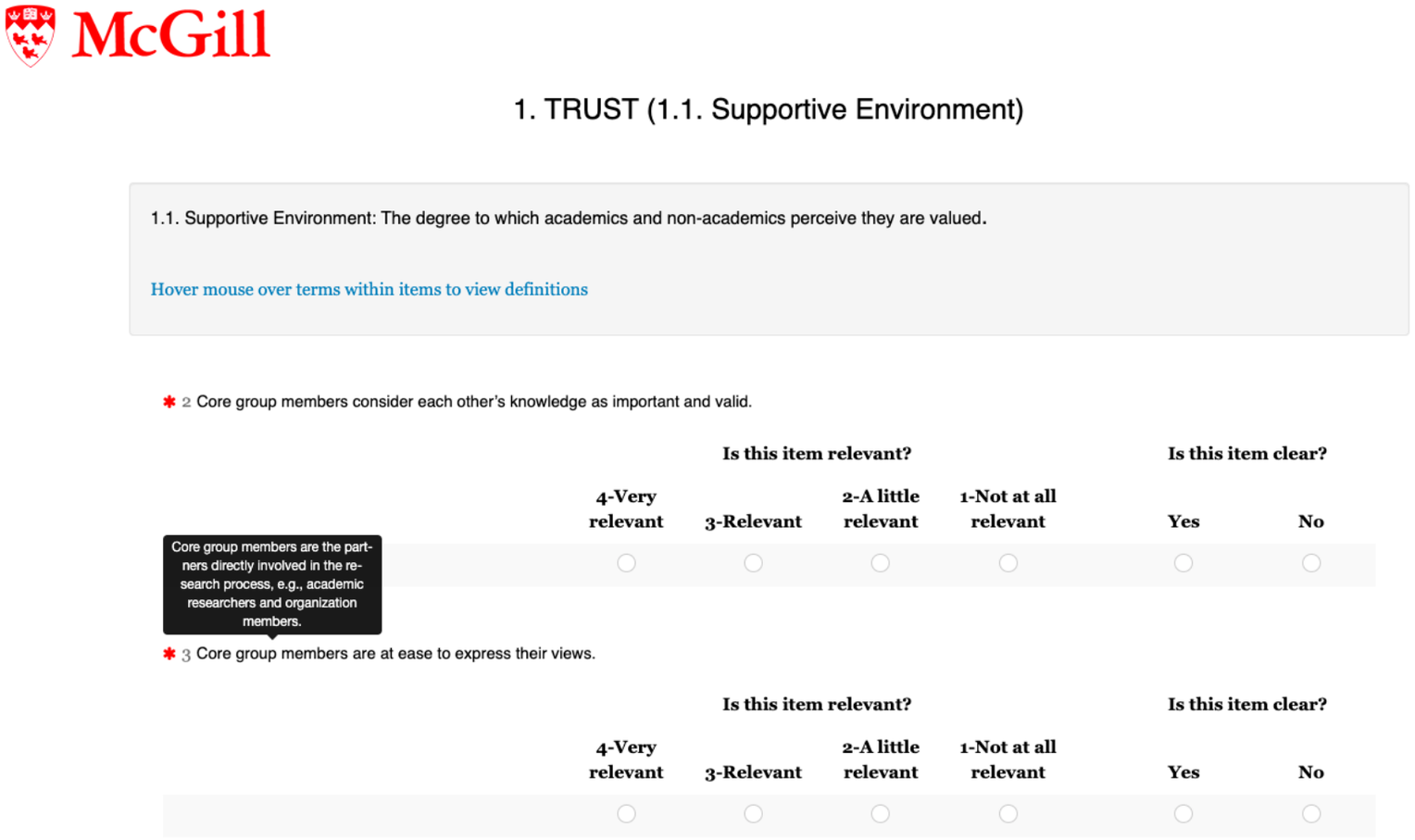
Waterman, H., Tillen, D., Dickson, R., & de Koning, K. (2001). Action research: a systematic review and guidance for assessment. *Health Technology Assessment*, *5*(23). https://doi.org/https://doi.org/10.3310/hta5230

Whetten, D. A. (2002). Modelling-as-Theorizing: A Systematic Methodology for Theory Development. In D. Partington (Ed.), *Essential Skills for Management Research* (pp. 45-71). SAGE Publications Ltd. https://doi.org/10.4135/9781848605305

Appendix 9. Search strategy used to search for OPR partnership questionnaires

(TITLE ("action research") OR TITLE ("participatory research") OR TITLE ("participative research") OR TITLE ("collaborative inquiry") OR TITLE ("collaborative action") OR TITLE ("collaborative partnership*") OR TITLE ("participatory rural appraisal") OR TITLE ("participatory appraisal") OR TITLE ("emancipatory research") OR TITLE ("social reconnaissance") OR TITLE ("empowerment evaluation") OR TITLE (((research[title]) OR design[title]) AND participatory[title]) OR TITLE ((action[title]) AND research[title]) OR TITLE ("participatory evaluation" [ti.ab]) OR TITLE ("participative evaluation" [ti.ab]) OR TITLE ("community driven research") OR TITLE ("action science") OR TITLE ("cooperative inquiry") OR TITLE ("dialectical inquiry") OR TITLE ("appreciative inquiry") OR TITLE ("decoloni#ing methodologies") OR TITLE ("democratic evaluation") OR TITLE ("recherche participative") OR TITLE ("recherche action") OR TITLE ("recherche collaborative") OR TITLE ("Community-Based Research") OR TITLE ("Patient engagement research") OR TITLE ("Community engagement research") OR TITLE ("Integrated knowledge translation") OR TITLE ("Implementation science") OR TITLE ("Implementation research") OR TITLE ("CBPR") AND TITLE (organi#ation$) OR TITLE (institution$) OR TITLE (facility) OR TITLE (facilities) OR TITLE (unit) OR TITLE (units) OR TITLE (center?) OR TITLE (centre?) OR TITLE (association?) AND TITLE (questionnaire*[ ) OR TITLE (survey*) OR TITLE (scale*) OR TITLE (test*) OR TITLE (instrument*) OR TITLE (psychometr*) OR TITLE (checklist*) OR TITLE (inventory) OR TITLE (inventories) OR TITLE (valid*) OR TITLE (reliab*))

Appendix 10. Sample page from LimeSurvey



McGill

1. TRUST (1.1. Supportive Environment)

1.1. Supportive Environment: The degree to which academics and non-academics perceive they are valued.

Hover mouse over terms within items to view definitions

* 2 Core group members consider each other's knowledge as important and valid.

	Is this item relevant?				Is this item clear?	
	4-Very relevant	3-Relevant	2-A little relevant	1-Not at all relevant	Yes	No
Core group members are the partners directly involved in the research process, e.g., academic researchers and organization members.	○	○	○	○	○	○

* 3 Core group members are at ease to express their views.

	Is this item relevant?				Is this item clear?	
	4-Very relevant	3-Relevant	2-A little relevant	1-Not at all relevant	Yes	No
	○	○	○	○	○	○

Appendix 11. Full results of the e-Delphi

Trust

Supportive environment

The number of items (n=3) did not change as a result of the Delphi. However, the item Leaders from the different organizations approve each phase of the research process was modified to Leaders from the organization(s) involved approve the research process. To address experts' comments, we removed 'each phase of' to make clear we refer to leaders approving the research process overall, added involved, and added (s) next to organization to highlight that OPR may involve only one organization.

Common understanding

The number of items increased from 4 to 5 upon completing the Delphi. We added the items Partnership values and Data ownership because experts highlighted these as important components of developing a common understanding. We removed the item Deliverables of the partnership because only 63.2% of experts rated it as clear, and as experts noted, deliverables may not be relevant for all OPRs, given that not all OPRs have products. Finally, we modified the item Objectives of partnership to Goals of the partnership since goals are broader, whereas objectives usually pertain to research.

Shared Power

The number of items (n=4), and their wording, remained unchanged upon completion of the Delphi.

Strategic Alignment

The number of items increased from 2 to 3 as a result of the Delphi. We added the item The partnership research objectives relate to the priorities from the organization(s) involved as per the suggestion of an expert. We added involved and (s) to make clear we refer to organization(s) undergoing practice change.

Sustainability

Problem Solving

The number of items (n=3) remained the same after completion of the Delphi. We modified the item Core group members are effective in problem solving to Core group members try to solve problems when possible, given that experts highlighted that although not all problems can be solved, learning can always occur from trying. Further, we modified the item Disagreements do not hinder the functioning of the core group to Disagreements between core group members are managed to strengthen the research process. We replaced functioning of the core group with research process since the main activity of OPR is research. Moreover, experts agreed that disagreement can be positive, e.g., lead to more contextualized research and trust.

Commitment

The number of items (n=3) remained the same after completion of the Delphi. We modified the item The time investment from your organization in the partnership is appropriate to The time investment from core group members in the partnership is appropriate. We do so to make clear that we are assessing the time investment from all core group members, not simply those within the health organization. This addresses the comment by one expert to assess the time investment of each partner. Further, we modified the item Core group members have discussed the continuation of their relationship after the research project is complete to Core group members discuss the opportunity to continue their relationship after the present research project. To improve clarity, we replaced continuation with opportunity.

Partnership Cohesion

No changes were made to the items

Synergy

The number of items reduced from 4 to 3, as a result of the Delphi. We modified the item The partnership's benefits are worth the partnership's drawbacks to The partnership's benefits are worth the partnership's challenges. We do so because experts had trouble understanding the word

drawback. Further, we modified the item The partnership has led to extra benefits (outside the research objectives) to The partnership has led to extra benefits (outside the research goals). We changed objectives for goals to be consistent with the item Goals of partnership within Common Understanding. We removed the item The partnership has led to new routinized activities within my organization, since the item is redundant with the new practices dimension.

Collective Learning

New Knowledge

The number of items increased from 2 to 3 after the Delphi. We added the item Core group members' understanding of the topic under study following the suggestion of an expert. We modified the item Core group members' understanding of the implication of research results for their organizational practice to Core group members' understanding of the added value of research results for improving organizational practice. We did so since added value is clearer than implication. Further, adding the phrase for improving, emphasizes that the value of OPR is to improve organizational practice. Last, removing the word their makes clear that we are referring only to the health organization's practice.

New Attitudes

The number of items (n=3) remained the same after completion of the Delphi. We modified all three items, to include increase or reduce within the items, as experts mentioned that it is confusing to read these terms at the beginning of the items. Further, we chose to use receptiveness across all items, because it is a strengths-based word and because it made more grammatical sense, e.g., cannot increase views, rather receptiveness.

The previous items, and modified items, are presented as follows:

- Increased core group members' receptiveness to new ideas from members of their respective organizations to Core group members have increased their receptiveness to new ideas from each other.

- Increased core group members' view that working together is more likely to have an impact to Core group members have increased their receptiveness to the idea that working together is more likely to have an impact.

- Reduced core group members' resistance to change certain aspects of their organizational practice to Core group members have increased their receptiveness to organizational practice change.

New Practices

The number of items (n=3) remained the same after completion of the Delphi. We modified all three items, to include has improved within the items, as experts highlighted this makes the items clearer.

The previous items, and modified items, are presented as follows:

- Core group members' capacity to undertake organizational participatory research to Core group members have improved their capacity to undertake organizational participatory research.

- Core group members' ability to ask relevant organizational participatory research questions to Core group members have improved their ability to ask relevant organizational participatory research questions.

- Core group members' organizational practice to The partnership has changed practices within the organization(s) involved.

Appendix 12. OPREM V3

1. TRUST
1.1 Supportive Environment: The degree to which academics and non-academics perceive they are valued.
1.1.1 Core group members consider each other's knowledge as important and valid.
1.1.2 Core group members are at ease to express their views.
1.1.3 Leaders from the organization(s) involved approve the research process.
1.2 Common Understanding: The degree to which academics and non-academics have developed a formal partnership agreement (along a continuum from no discussion to a detailed written contract).
Please indicate the way the core group members addressed the following:
1.2.1. Goals of the partnership
1.2.2 Partnership values
1.2.3 Roles and responsibilities of core group members
1.2.4 Timelines of the partnership activities
1.2.5 Data ownership
1.3 Shared Power: The degree to which academics and non-academics have equal authority in making decisions about the research.
Please specify the level of decision-making power at each research phase:
1.3.1 Shaping the research question(s)
1.3.2 Deciding on the methods
1.3.3 Interpreting the study results
1.3.4 Putting results into practice
1.4 Strategic Alignment: The degree to which academics and non-academics conduct research that is relevant to the organization (including the application of results).
1.4.1 Core group members understand organizational leaders' priorities
1.4.2 The partnership's priorities fit with organizational leaders' priorities
1.4.3 The partnership research objectives relate to the priorities from the organization(s) involved.
2. SUSTAINABILITY
2.1 Problem Solving: The degree to which academics and non-academics settle difficulties.
2.1.1 Core group members try to solve problems when possible
2.1.2 Disagreements between core group members are managed to strengthen the research process.
2.1.3 Conflict between core group members is dealt with openly
2.2 Commitment: The degree to which academics and non-academics are invested in their partnership.
2.2.1 Core group members are committed to the partnership
2.2.2 The time investment from core group members in the partnership is appropriate.
2.2.3 Core group members discuss the opportunity to continue their relationship after the present research project
2.3 Partnership Cohesion: The degree to which academics and non-academics are unified while working on the research.

2.3.1 Core group members communicate with each other respectfully
2.3.2 Core group members can adapt to each other's needs
2.3.3 Core group members support each other publicly
2.3.4 Core group members are open to revising plans and timelines
2.4 Synergy: The degree to which academics' and non-academics' perceived benefits of the partnership are greater than the potential benefits of a similar research project without partnership (synergistic partnerships' benefits being increased knowledge, skills and resources – surpassing partnerships' drawbacks such as time investment).
2.4.1 The partnership's benefits are worth the partnership's challenges.
2.4.2 The partnership has led to new learning within my organization
2.4.3 The partnership has led to extra benefits (outside the research goals)
3. COLLECTIVE LEARNING
3.1 New Knowledge: The degree to which academics and non-academics perceive that they have developed a better consciousness of their practice.
Please indicate to what degree the partnership has increased:
3.1.1 Core group members' awareness of their different perspectives
3.1.2 Core group members' understanding of the topic under study
3.1.3 Core group members' understanding of the added value of research results for improving organizational practice
3.2 New attitudes: The degree to which academics and non-academics perceive they have renewed their feelings about their own professional practice and routines, and the organization overall (e.g., their perception regarding how the health organization(s) value(s) scientific evidence and its application in practice).
3.2.1 Core group members have increased their receptiveness to new ideas from each other
3.2.2 Core group members have increased their receptiveness to the idea that working together is more likely to have an impact
3.2.3 Core group members have increased their receptiveness to organizational practice change
3.3 New practices: The degree to which academics and non-academics perceive that they have acquired new practices (including the improvement of current practices).
3.3.1 Core group members have improved their capacity to undertake organizational participatory research.
3.3.2 Core group members have improved their ability to ask relevant organizational participatory research questions.
3.3.3 The partnership has changed practices within the organization(s) involved.

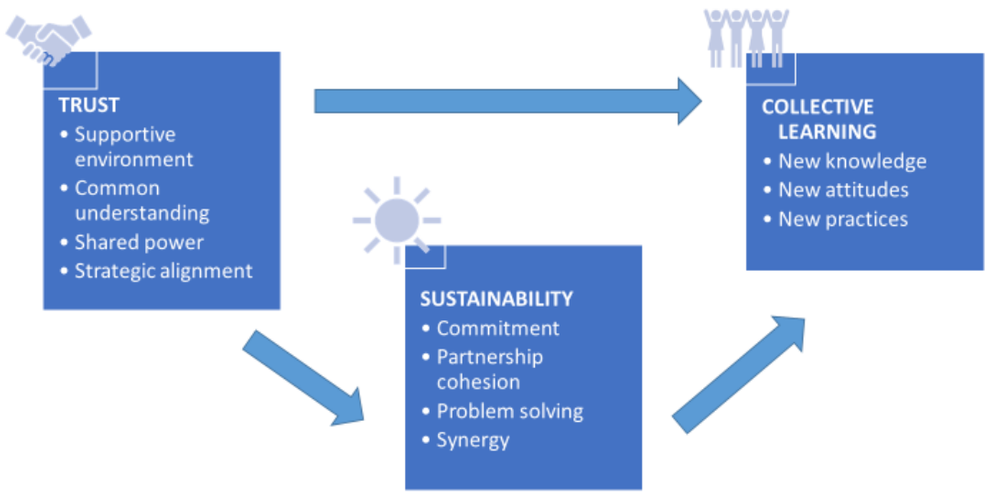
- Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are 'academic researcher' and 'health organization member'.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.
- Organizational leaders are the decision makers who manage the practices, programs, and services of a health organization.
- Organizational practice includes organizational routines, professional practice, and research approach.

Appendix 13. OPREM V4

The Organizational Participatory Research Evaluation Method (OPREM) version four (V4), is a 30-item questionnaire that assesses organizational participatory research (OPR) partnerships, i.e., an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).

Evaluating such partnerships is important because evaluation can be used to stimulate partnership discussions and inform partnership improvement. For example, evaluation can be used to identify important partnership features that OPR partnership members may not be aware of.

OPR partnership members can use the OPREM as frequently as they wish. Moreover, OPR partnership members can use the OPREM however they wish, i.e., choose to use only some concepts, dimensions, or items. The theory upon which the OPREM is based, and an overview of the OPREM, is provided below.



Construct = Organizational Participatory Research Partnership

Concepts = Trust, Sustainability, Collective Learning

CONCEPTS	DIMENSIONS	NUMBER OF ITEMS
Trust	Supportive Environment	3
	Common Understanding	5
	Shared Power	4
	Strategic Alignment	2
Sustainability	Problem Solving	2
	Commitment	3
	Partnership Cohesion	3
	Synergy	2
Collective Learning	New Knowledge	2
	New Attitudes	2
	New Practices	2

TRUST: The degree to which academics and non-academics perceive the partnership as providing a supportive environment, a common understanding of the research, shared power, and a research strategy aligned with the missions, values or plans of the health organization(s).

Supportive Environment: The degree to which academics and non-academics perceive they are valued.

Number	Item	Response
1.	Core group members** consider each other's knowledge as important.	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**
2.	Core group members** are at ease to express their views.	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**
3.	There is a climate of mutual respect within the partnership*.	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**

- * An OPR partnership is an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).
- ** Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are 'academic researcher' and 'health organization member'.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.

Please comment on your answers here, if needed

_____

_____

_____

Common Understanding: The degree to which academics and non-academics have developed a formal partnership agreement (along a continuum from no discussion to a detailed written contract).

Number	Item	Response
	Please indicate the way the core group members** addressed the following:	
4.	Partnership* values	○ **Not discussed** ○ **Somewhat discussed** ○ **Discussed in-depth** ○ **Discussed and written** ○ **Discussed, written, and signed**
5.	Goals of the partnership*	○ **Not discussed** ○ **Somewhat discussed** ○ **Discussed in-depth** ○ **Discussed and written** ○ **Discussed, written, and signed**
6.	Roles and responsibilities of core group members**	○ **Not discussed** ○ **Somewhat discussed** ○ **Discussed in-depth** ○ **Discussed and written** ○ **Discussed, written, and signed**
7.	Timelines*** of the partnership* activities	○ **Not discussed** ○ **Somewhat discussed** ○ **Discussed in-depth** ○ **Discussed and written** ○ **Discussed, written, and signed**
8.	Intellectual property	○ **Not discussed** ○ **Somewhat discussed** ○ **Discussed in-depth** ○ **Discussed and written** ○ **Discussed, written, and signed**

- *An OPR partnership is an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).
- **Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are ‘academic researcher’ and ‘health organization member’.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.
- ***Timelines refers to all timelines within the OPR, including timelines that are specific, e.g., due date for OPR data analysis, or large, i.e., due date for entire OPR.

Please comment on your answers here, if needed

_____

_____

_____

Shared Power: The degree to which academics and non-academics have equal authority in making decisions about the research.

Number	Item	Response
	Please specify the level of decision-making power at each research phase:	The decision-making power between academics and non-academics is:
9.	Shaping the research question(s)	Unbalanced Somewhat balanced Balanced Very balanced
10.	Deciding on the methods*	Unbalanced Somewhat balanced Balanced Very balanced
11.	Interpreting the study results[t]	Unbalanced Somewhat balanced Balanced Very balanced
12.	Performing knowledge translation[t]	Unbalanced Somewhat balanced Balanced Very balanced

- *Methods includes all procedures used to answer the research question, such as recruitment, using existing validated instruments or developing and validating instruments to collect data, data analysis, etc.

[t] This item can be evaluated when some OPR results are available

Please comment on your answers here, if needed

_____

_____

_____

Strategic Alignment: The degree to which academics and non-academics conduct research that is relevant to the organization (including the application of results).

Number	Item	Response
13.	Core group members** understand the priorities**** of the organization(s)*** involved	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**
14.	The partnership's* goals fit with the priorities**** from the organization(s)*** involved	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**

- * An OPR partnership is an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).
- **Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are 'academic researcher' and 'health organization member'.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.
- *** An organization is a group with a mission related to healthcare.
- ****Organizational priorities refer to the most important tasks that an organization must accomplish, at a given time, e.g., priority of a community health center to begin community vaccination programs during the cold and flu season.

Please comment on your answers here, if needed

_____

_____

_____

SUSTAINABILITY: The degree to which academics and non-academics are committed to each other, experience partnership cohesion, engage in problem solving, and work in a synergistic manner.

Problem Solving: The degree to which academics and non-academics settle difficulties.

Number	Item	Response
15.	Core group members* are open to discussing problems	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**
16.	Disagreements between core group members* are managed to strengthen the research process.	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**

- *Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are 'academic researcher' and 'health organization member'.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.

Please comment on your answers here, if needed

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Commitment: The degree to which academics and non-academics are invested in their partnership.

Number	Item	Response
17.	Core group members** are motivated to participate in the partnership*	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**
18.	The time investment from core group members** adds value to the partnership*	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**
19.	Core group members** discuss the possibility to continue their relationship after the present research project	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**

- *An OPR partnership is an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).
- **Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are 'academic researcher' and 'health organization member'.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.

Please comment on your answers here, if needed

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Partnership Cohesion: The degree to which academics and non-academics are unified while working on the research.

Number	Item	Response
20.	Communication among core group members** adds value to the partnership*	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**
21.	Core group members** can adapt to each other	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**
22.	Core group members** support each other publicly***	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**

- *An OPR partnership is an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).
- **Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are ‘academic researcher’ and ‘health organization member’.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.
- *** An example of core group members supporting each other publicly includes the dissemination of the partnership research with groups outside the partnership.

Please comment on your answers here, if needed

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Synergy: The degree to which academics' and non-academics' perceived benefits of the partnership are greater than the potential benefits of a similar research project without partnership (synergistic partnerships' benefits being increased knowledge, skills and resources – surpassing partnerships' drawbacks such as time investment).

Number	Item	Response
23.	The partnership's* benefits** are worth the partnership's* challenges.	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**
24.	The partnership* has led to extra benefits*** (outside the research goals)	○ **agree completely** ○ **agree a little** ○ **neither agree or disagree** ○ **disagree a little** ○ **disagree completely**

- *An OPR partnership is an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).
- **Benefits refer to the expected positive outcomes of an OPR, i.e., increased knowledge, skills and resources that lead to organizational practice improvement.
- ***Extra-benefits refer to any positive outcomes outside the expected practice improvement, e.g., core group members become friends, clinicians learn how to work together more effectively, practice improvements within other organizations, or development of new OPR endeavors (Bush et al., 2017).

Please comment on your answers here, if needed

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COLLECTIVE LEARNING: The degree to which academics and non-academics perceive that they and their respective organizations have developed new knowledge, attitudes and practices.

New Knowledge: The degree to which academics and non-academics perceive that they have developed a better consciousness of their practice.

Number	Item	Response
	Please indicate to what degree the partnership* has increased:	
25.	Core group members'** understanding of the topic under study	○ **Very likely** ○ **Likely** ○ **Possibly** ○ **A little likely** ○ **Not very likely**
26.	Core group members'** understanding of the added value of organizational participatory research for improving organizational practice***	○ **Very likely** ○ **Likely** ○ **Possibly** ○ **A little likely** ○ **Not very likely**

- *An OPR partnership is an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).
- **Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are 'academic researcher' and 'health organization member'.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.
- *** Organizational practice includes organizational routines, professional practice, and research approach.

Please comment on your answers here, if needed

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New attitudes: The degree to which academics and non-academics perceive they have renewed their feelings about their own professional practice and routines, and the organization overall (e.g., their perception regarding how the health organization(s) value(s) scientific evidence and its application in practice).

Number	Item	Response
	Please indicate to what degree the partnership* has increased:	
27.	Core group members'** receptiveness to new ideas from each other	○ **Very likely** ○ **Likely** ○ **Possibly** ○ **A little likely** ○ **Not very likely**
28.	Core group members'** receptiveness to organizational practice*** change	○ **Very likely** ○ **Likely** ○ **Possibly** ○ **A little likely** ○ **Not very likely**

- *An OPR partnership is an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).
- **Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are ‘academic researcher’ and ‘health organization member’.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.
- *** Organizational practice includes organizational routines, professional practice, and research approach.

Please comment on your answers here, if needed

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New practices: The degree to which academics and non-academics perceive that they have acquired new practices (including the improvement of current practices).

Number	Item	Response
29.	Core group members** have improved their capacity to undertake organizational participatory research.	○ **Very likely** ○ **Likely** ○ **Possibly** ○ **A little likely** ○ **Not very likely**
30.	The partnership* has changed practices**** within the organization(s)*** involved.	○ **Very likely** ○ **Likely** ○ **Possibly** ○ **A little likely** ○ **Not very likely**

- *An OPR partnership is an approach where academics and non-academics partner to conduct research aimed at organizational practice improvement (Argyris et al., 1985; Waterman et al., 2001).
- **Core group members are the partners directly involved in the research process.
- For example, two roles in the partnership are 'academic researcher' and 'health organization member'.
    - An academic researcher could belong to a university, college, or research unit within a health centre.
    - Organization member could belong to a health governance agency, health system, hospital or clinic.
- ***An organization is a group with a mission related to healthcare.
- **** Organizational practice includes organizational routines, professional practice, and research approach.

Please comment on your answers here, if needed

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Argyris, C., Putnam, R., & Smith, D. M. (1985). *Action Science: Promoting Learning for Action and Change*. Jossey-Bass. https://actiondesign.com/resources/readings/action-science

Bush, P. L., Pluye, P., Loignon, C., Granikov, V., Wright, M. T., Pelletier, J.-F., Bartlett-Esquilant, G., Macaulay, A. C., Haggerty, J., Parry, S., & Repchinsky, C. (2017). Organizational participatory research: a systematic mixed studies review exposing its extra benefits and the key factors associated with them. *Implementation Science*, *12*(1), Article 119. https://doi.org/10.1186/s13012-017-0648-y

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Appendix 14. Comparing the OPREMs V3 and V4 with previous OPR reviews

OPREM V3	OPREM V4	Partnership elements from literature	Review
TRUST	TRUST	Trust	Beal (2012); De Geest et al. (2013)
Supportive Environment: The degree to which academics and non-academics perceive they are valued.	Supportive Environment: The degree to which academics and non-academics perceive they are valued.	Feeling appreciated	Beal (2012); De Geest et al. (2013)
Core group members consider each other's knowledge as important and valid.	Core group members consider each other's knowledge as important.	Na	Na
Core group members are at ease to express their views.	Core group members are at ease to express their views.	Freedom to express oneself	Tetui et al. (2018)
Leaders from the organization(s) involved approve the research process.	Na	Assistance from the organization(s), e.g., administrative staff	Beal (2012); De Geest et al. (2013); Tetui et al. (2018)
Na	There is a climate of mutual respect within the partnership.	Respect	Beal (2012); De Geest et al. (2013)
Common Understanding: The degree to which academics and non-academics have developed a formal partnership agreement (along a continuum from no discussion to a detailed written contract).	Common Understanding: The degree to which academics and non-academics have developed a formal partnership agreement (along a continuum from no discussion to a detailed written contract).	Formal partnership agreements	Beal (2012)
Please indicate the way the core group members addressed the following:	Please indicate the way the core group members addressed the following:	Na	Na
Goals of the partnership	Goals of the partnership	Unified purpose	Beal (2012); De Geest et al. (2013); Tetui et al. (2018)
Partnership values	Partnership values	Na	Na
Roles and responsibilities of core group members	Roles and responsibilities of core group members	Partnership member roles	De Geest et al. (2013); Oberschmidt et al. (2022)
Timelines of the partnership activities	Timelines of the partnership activities	Partnership timelines	De Geest et al. (2013)
Data ownership	Intellectual property	Research ownership	Lawrence et al. (2019)

Shared Power: The degree to which academics and non-academics have equal authority in making decisions about the research.	Shared Power: The degree to which academics and non-academics have equal authority in making decisions about the research.	Democratization of research governance	De Geest et al. (2013); De Geest et al. (2013); Oberschmidt et al. (2022)
Please specify the level of decision-making power at each research phase:	Please specify the level of decision-making power at each research phase:	Na	Na
Shaping the research question(s)	Shaping the research question(s)	Na	Na
Deciding on the methods	Deciding on the methods	Na	Na
Interpreting the study results	Interpreting the study results	Na	Na
Putting results into practice	Na	Implementation of organizational improvements	Tetui et al. (2018); Lawrence et al. (2019)
Na	Performing knowledge translation	Dissemination of evidence Implementation of organizational improvements	Lawrence et al. (2019) Tetui et al. (2018); Lawrence et al. (2019)
Strategic Alignment: The degree to which academics and non-academics conduct research that is relevant to the organization (including the application of results).	Strategic Alignment: The degree to which academics and non-academics conduct research that is relevant to the organization (including the application of results).	Organizationally appropriate research	Boaz et al. (2015); Lawrence et al. (2019)
Core group members understand organizational leaders' priorities	Core group members understand the priorities of the organization(s) involved	Na	Na
The partnership's priorities fit with organizational leaders' priorities	The partnership's goals fit with the priorities from the organization(s) involved	Na	Na
The partnership research objectives relate to the priorities from the organization(s) involved.	Na	Na	Na
SUSTAINABILITY	SUSTAINABILITY	Na	Na
Problem Solving: The degree to which academics and non-academics settle difficulties.	Problem Solving: The degree to which academics and non-academics settle difficulties.	Conflict resolution	Lawrence et al. (2019)
Core group members try to solve problems when possible	Na	Na	Na

Disagreements between core group members are managed to strengthen the research process.	Disagreements between core group members are managed to strengthen the research process.	Na	Na
Conflict between core group members is dealt with openly	Core group members are open to discussing problems	Na	Na
Commitment: The degree to which academics and non-academics are invested in their partnership.	Commitment: The degree to which academics and non-academics are invested in their partnership.	Commitment	Beal (2012); De Geest et al. (2013)
Core group members are committed to the partnership	Core group members are motivated to participate in the partnership	Commitment	Beal (2012); De Geest et al. (2013)
The time investment from core group members in the partnership is appropriate.	The time investment from core group members adds value to the partnership	Sufficient time and resources	Beal (2012); De Geest et al. (2013)
Core group members discuss the opportunity to continue their relationship after the present research project	Core group members discuss the possibility to continue their relationship after the present research project	Planning Expansion of research partnerships from one project to another	De Geest et al. (2013) Lawrence et al. (2019)
Partnership Cohesion: The degree to which academics and non-academics are unified while working on the research.	Partnership Cohesion: The degree to which academics and non-academics are unified while working on the research.	Teamwork among partnership members Putting resources towards building interpersonal bonds	De Geest et al. (2013) Oberschmidt et al. (2022)
Core group members communicate with each other respectfully	Communication among core group members adds value to the partnership	Na	Na
Core group members can adapt to each other's needs	Core group members can adapt to each other	Being flexible, e.g., modifying timelines	Oberschmidt et al. (2022)
Core group members support each other publicly	Core group members support each other publicly	Na	Na
Core group members are open to revising plans and timelines	Na	Adapting partnership plans as needed	De Geest et al. (2013)
Synergy: The degree to which academics' and non-academics' perceived benefits of the partnership are greater than the potential benefits of a similar research project without partnership (synergistic partnerships' benefits being increased knowledge, skills and	Synergy: The degree to which academics' and non-academics' perceived benefits of the partnership are greater than the potential benefits of a similar research project without partnership (synergistic partnerships' benefits being increased knowledge, skills and	Integration of competencies	De Geest et al. (2013)

resources – surpassing partnerships' drawbacks such as time investment).	resources – surpassing partnerships' drawbacks such as time investment).		
The partnership's benefits are worth the partnership's challenges.	The partnership's benefits are worth the partnership's challenges.	Advantages for all partnership members, e.g., co-authorship on publications	De Geest et al. (2013)
The partnership has led to new learning within my organization	Na	Implementation of organizational improvements	Tetui et al. (2018); Lawrence et al. (2019)
The partnership has led to extra benefits (outside the research goals)	The partnership has led to extra benefits (outside the research goals)	Advantages for all partnership members, e.g., co-authorship on publications	De Geest et al. (2013)
COLLECTIVE LEARNING	COLLECTIVE LEARNING	Na	Na
New Knowledge: The degree to which academics and non-academics perceive that they have developed a better consciousness of their practice.	New Knowledge: The degree to which academics and non-academics perceive that they have developed a better consciousness of their practice.	New knowledge among organization members	Boaz et al. (2015); Oberschmidt et al. (2022)
Please indicate to what degree the partnership has increased:	Please indicate to what degree the partnership has increased:	Na	Na
Core group members' awareness of their different perspectives	Na	Partnership members' understanding of each other's practice	Oberschmidt et al. (2022)
Core group members' understanding of the topic under study	Core group members' understanding of the topic under study	Na	Na
Core group members' understanding of the added value of research results for improving organizational practice	Core group members' understanding of the added value of organizational participatory research for improving organizational practice	Na	Na
New attitudes: The degree to which academics and non-academics perceive they have renewed their feelings about their own professional practice and routines, and the organization overall (e.g., their perception regarding how the health organization(s) value(s) scientific evidence and its application in practice).	New attitudes: The degree to which academics and non-academics perceive they have renewed their feelings about their own professional practice and routines, and the organization overall (e.g., their perception regarding how the health organization(s) value(s) scientific evidence and its application in practice).	New attitudes among organization members	Boaz et al. (2015); Oberschmidt et al. (2022)

Na	Please indicate to what degree the partnership has increased:	Na	Na
Core group members have increased their receptiveness to new ideas from each other	Core group members' receptiveness to new ideas from each other	Na	Na
Core group members have increased their receptiveness to the idea that working together is more likely to have an impact	Na	Na	Na
Core group members have increased their receptiveness to organizational practice change	Core group members' receptiveness to organizational practice change	Na	Na
New practices: The degree to which academics and non-academics perceive that they have acquired new practices (including the improvement of current practices).	New practices: The degree to which academics and non-academics perceive that they have acquired new practices (including the improvement of current practices).	New practices among organization members	Boaz et al. (2015); Oberschmidt et al. (2022)
Core group members have improved their capacity to undertake organizational participatory research.	Core group members have improved their capacity to undertake organizational participatory research.	Na	Na
Core group members have improved their ability to ask relevant organizational participatory research questions.	Na	Na	Na
The partnership has changed practices within the organization(s) involved.	The partnership has changed practices within the organization(s) involved.	Implementation of organizational improvements	Tetui et al. (2018); Lawrence et al. (2019)

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Appendix 15. Comparing OPREMs V3 and V4 with existing OPR partnership questionnaires

Questionnaire	Number of items (excludes open ended questions)	Evaluates OPR partnership concepts of Trust, Sustainability and Collective learning	Uses a variance approach (Poole, 2006)	Evaluates partnerships containing all types of partnership members	Content Validated
Partnership Strength Survey (Savitz, 2007)	42	Trust, Sustainability and Collective learning	No	Yes	No
Community Impacts of Research Oriented Partnerships (CIROP) questionnaire (King et al., 2009)	33	Collective learning	Yes	No	Yes
CIROP Respondent Form (King et al., 2009)	30	Unclear	No	No	Unclear
Seniors Health Research Transfer Network Community of Practice Evaluation Tool (Lusk & Harris, 2010)	21	Collective learning	No	No	No
Partnership Indicators Questionnaire (Kothari et al., 2011)	84	Trust and Sustainability	No	No	Yes
Canadian Institutes of Health Research researcher-knowledge user integrated knowledge translation survey (Tetroe, 2011)	66	Sustainability and Collective learning	No	Yes	No
OPREM V2 (Hamzeh et al., 2018; Hamzeh et al., 2019)	95	Trust, Sustainability and Collective learning	Yes	Yes	No

OPREM V3	37	Trust, Sustainability and Collective learning	Yes	Yes	Yes
OPREM V4	30	Trust, Sustainability and Collective learning	Yes	Yes	Yes

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