

# BMJ Open

BMJ Open is committed to open peer review. As part of this commitment we make the peer review history of every article we publish publicly available.

When an article is published we post the peer reviewers' comments and the authors' responses online. We also post the versions of the paper that were used during peer review. These are the versions that the peer review comments apply to.

The versions of the paper that follow are the versions that were submitted during the peer review process. They are not the versions of record or the final published versions. They should not be cited or distributed as the published version of this manuscript.

BMJ Open is an open access journal and the full, final, typeset and author-corrected version of record of the manuscript is available on our site with no access controls, subscription charges or pay-per-view fees (<http://bmjopen.bmj.com>).

If you have any questions on BMJ Open's open peer review process please email [info.bmjopen@bmj.com](mailto:info.bmjopen@bmj.com)

# BMJ Open

## Older Adults' Experiences and Perceived Impacts of the Aging, Community and Health Research Unit – Community Partnership Program (ACHRU-CPP) for Diabetes Self-Management

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2022-068694
Article Type:	Original research
Date Submitted by the Author:	27-Sep-2022
Complete List of Authors:	<p>Yous, Marie-Lee; McMaster University Faculty of Health Sciences, School of Nursing</p> <p>Ganann, Rebecca; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Ploeg, Jenny ; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Markle-Reid, Maureen; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Northwood, Melissa ; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Fisher, Kathryn ; McMaster University School of Nursing, School of Nursing, Aging, Community and Health Research Unit</p> <p>Valaitis, Ruta; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Chambers, Tracey; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Montelpare, William; University of Prince Edward Island, Department of Applied Human Sciences, Faculty of Science</p> <p>Légaré, France; VITAM Centre de recherche en santé durable; Laval University, Department of Family and Emergency Medicine, Faculty of Medicine</p> <p>Beleno, Ron; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Gaudet, Gary; University of Prince Edward Island</p> <p>Giacometti, Luisa; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Lively, Deborah; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Lindsay, Craig; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit</p> <p>Morrison, Allan; University of Prince Edward Island</p>
Keywords:	QUALITATIVE RESEARCH, General diabetes < DIABETES & ENDOCRINOLOGY, PRIMARY CARE

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



BMJ Open: first published as 10.1136/bmjopen-2022-068694 on 5 April 2023. Downloaded from <http://bmjopen.bmj.com/> on April 22, 2024 by guest. Protected by copyright.



I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our [licence](#).

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which [Creative Commons](#) licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

BMJ Open

**Original Research**

**Title:** Older Adults' Experiences and Perceived Impacts of the Aging, Community and Health Research Unit – Community Partnership Program (ACHRU-CPP) for Diabetes Self-Management

**Corresponding Author:** Marie-Lee Yous, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, 1280 Main Street West, Room HSC 3N25, Hamilton, Ontario L8S 4K1, Canada, Email: [yousm@mcmaster.ca](mailto:yousm@mcmaster.ca); ORCID: 0000-0002-4271-0401

Marie-Lee Yous, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [yousm@mcmaster.ca](mailto:yousm@mcmaster.ca) ORCID: 0000-0002-4271-0401

Rebecca Ganann, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, email: [ganannrl@mcmaster.ca](mailto:ganannrl@mcmaster.ca) ORCID: 0000-0002-7566-8932

Jenny Ploeg, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [ploegi@mcmaster.ca](mailto:ploegi@mcmaster.ca) ORCID: 0000-0001-8168-8449

Maureen Markle-Reid, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [mreid@mcmaster.ca](mailto:mreid@mcmaster.ca) ORCID: 0000-0002-4019-7077

Melissa Northwood, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [northwm@mcmaster.ca](mailto:northwm@mcmaster.ca) ORCID: 0000-0001-5043-8068

Kathryn Fisher, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada [fisheka@mcmaster.ca](mailto:fisheka@mcmaster.ca) ORCID: 0000-0001-8342-1238

Ruta Valaitis, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [valaitis@mcmaster.ca](mailto:valaitis@mcmaster.ca) ORCID: [0000-0002-3117-0542](https://orcid.org/0000-0002-3117-0542)

Tracey Chambers, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [chambt@mcmaster.ca](mailto:chambt@mcmaster.ca) ORCID: 0000-0002-9325-6894

William Montelpare, Margaret and Wallace McCain Chair in Human Development and Health, Department of Applied Human Sciences, Faculty of Science, University of Prince Edward

## BMJ Open

1  
2  
3 45 Island, Charlottetown, Prince Edward Island, Canada, email: [wmontelpare@upei.ca](mailto:wmontelpare@upei.ca) ORCID:  
4 46 0000-0002-4167-4613  
5  
6

7 48 France Légaré, VITAM-Centre de recherche en santé durable, Université Laval, Québec City,  
8 49 Québec, Canada, email: [France.legare@fmed.ulaval.ca](mailto:France.legare@fmed.ulaval.ca) ORCID: 0000-0002-2296-6696  
9

10 51 Ron Beleno, Patient/Public Research Partner, Aging, Community and Health Research Unit,  
11 52 Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada email:  
12 53 [ron@rb33.com](mailto:ron@rb33.com)  
13

14 54  
15 55 Gary Gaudet, Patient/Public Research Partner, University of Prince Edward Island,  
16 56 Charlottetown, Prince Edward Island, Canada, email: [l.ggaudet@bellaliant.net](mailto:l.ggaudet@bellaliant.net)  
17

18 58 Luisa Giacometti, Patient/Public Research Partner, School of Nursing, Aging, Community and  
19 59 Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
20 60 Canada, email: [luisag@bell.net](mailto:luisag@bell.net)  
21

22 61  
23 62 Deborah Levely, Patient/Public Research Partner, School of Nursing, Aging, Community and  
24 63 Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
25 64 Canada, email: [deborah.levely@rogers.com](mailto:deborah.levely@rogers.com)  
26

27 66 Craig Lindsay, Patient/Public Research Partner, School of Nursing, Aging, Community and  
28 67 Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
29 68 Canada, email: [lindsay.cr@gmail.com](mailto:lindsay.cr@gmail.com)  
30

31 69  
32 70 Allan Morrison, Patient/Public Research Partner, University of Prince Edward Island,  
33 71 Charlottetown, Prince Edward Island, Canada, email: [allan.morrison62.am@gmail.com](mailto:allan.morrison62.am@gmail.com)  
34

35 73 **On behalf of the ACHRU-CPP Research Team**  
36

37 74  
38 75 **Word count** excluding title page, abstract, references, figures and tables (**max 4,000**): 4,000  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## BMJ Open

1  
2  
3 77 **Abstract (max 300 words):** 299 words  
4

5 78 **Objectives:** The aim of this study was to assess the experiences and perceived impacts of the  
6  
7  
8 79 Aging, Community and Health Research Unit – Community Partnership Program (ACHRU-  
9  
10 80 CPP) from the perspectives of older adults with diabetes and other chronic conditions. The  
11  
12 81 ACHRU-CPP is a complex 6-month self-management evidence-based intervention for  
13  
14 82 community-living older adults aged 65 years or older with Type 1 or Type 2 diabetes and at least  
15  
16 83 one other chronic condition. Its components include home and phone visits, care coordination,  
17  
18 84 system navigation support, caregiver support, and group wellness sessions delivered by a nurse,  
19  
20 85 dietitian or nutritionist, and community program coordinator to meet older adults' health and  
21  
22 86 social needs.  
23  
24

25  
26 87 **Design:** A qualitative descriptive design embedded within a randomized controlled trial was  
27  
28 88 used.  
29

30  
31 89 **Setting:** Six trial sites offering primary care services from three Canadian provinces (i.e.,  
32  
33 90 Ontario, Quebec, and Prince Edward Island) were included.  
34

35 91 **Participants:** The sample consisted of 45 community-living older adults aged 65 years or older  
36  
37 92 with diabetes and at least one other chronic condition.  
38

39  
40 93 **Methods:** Participants completed semi-structured post-intervention interviews that were  
41  
42 94 completed by phone in English or French. The analytical process followed Braun and Clarke's  
43  
44 95 experiential thematic analysis framework. Patient partners informed study design and  
45  
46 96 interpretation.  
47  
48

49 97 **Results:** Older adults reported positive experiences with the ACHRU-CPP that supported  
50  
51 98 diabetes self-management such as, improved knowledge in managing diabetes and other chronic  
52  
53 99 conditions, enhanced physical activity and function, improved eating habits, and opportunities  
54  
55  
56  
57

BMJ Open

1  
2  
3 100 for socialization. They reported being connected to community resources by the intervention  
4  
5 101 team to address social determinants of health and support self-management practices.  
6  
7

8 102 **Conclusions:** Older adults perceived that a 6-month person-centred intervention collaboratively  
9  
10 103 delivered by a team of health and social care providers helped support chronic disease self-  
11  
12 104 management. There is a need for providers to help older adults connect with available health and  
13  
14 105 social services in the community.  
15  
16

### 17 106

### 18

### 19 107 **Strengths and limitations of this study**

### 20

- 21 108 • This study included a rigorous qualitative design with a large sample size.
- 22 109 • There was the inclusion of diverse participants with regards to sex, marital status, and  
23  
24 110 annual income from multiple sites across Canada.
- 25  
26 111 • A limitation of the study is the lack of cultural diversity with regards to ethnicity and  
27  
28 112 under-representation of older adults from marginalized communities.  
29  
30  
31  
32

33 113

34  
35 114 **Keywords:** diabetes self-management, older adults, community, primary care, qualitative  
36  
37  
38 115  
39  
40 116  
41  
42 117  
43  
44 118  
45  
46 119  
47  
48 120  
49  
50 121  
51  
52 122  
53  
54  
55  
56  
57  
58  
59  
60



## 123 Introduction

124 As of 2022, approximately 422 million people have been diagnosed with diabetes  
125 mellitus worldwide [1]. Older adults are more likely to have Type 2 diabetes than younger adults  
126 [2] and are at risk for hypoglycemia which can adversely affect cognition, vision, hearing,  
127 mobility, and mental health [3] as well as self-care activities including exercise and diet. More  
128 than 40% of older adults with diabetes have three or more chronic conditions [4], including  
129 hyperlipidemia, hypertension, asthma, chronic obstructive pulmonary disease, chronic kidney  
130 disease, arthritis, and heart failure [5]. Following management plans for one condition may be  
131 challenging due to symptoms or conflicting guidelines from another condition. Higher burden  
132 associated with the presence of multiple chronic conditions (MCC) has been linked to higher risk  
133 for mortality, decreased physical and mental functioning, and increased health services use [2, 6,  
134 7]. Community-dwelling older adults with MCC are highly reliant on family/friend caregivers  
135 for support [8], which can lead to poor mental and physical health, and financial losses among  
136 caregivers [9]. Caregivers' unmet needs [10] can lead to their increased use of hospital and  
137 emergency services.

138 Complex health interventions are defined as having multiple interacting components [11].  
139 For older adults with diabetes, complex health interventions such as peer support programs, have  
140 demonstrated positive effects in managing their complex needs, sustaining lifestyle changes, and  
141 achieving health benefits [12-17]. Complex interventions that target self-care and incorporate  
142 opportunities for peer-to-peer discussions among community-dwelling older adults can improve  
143 their mental and physical health and reduce falls [18, 19]. Nurse-led self-management programs  
144 for diabetes and other chronic conditions can lead to improvements in self-rated health, glycated  
145 hemoglobin (HbA1c) values, blood pressure, weight, and self-management behaviours [19, 20].

## BMJ Open

1  
2  
3 146 Providing diabetes self-management programs through partnerships between primary care and  
4  
5 147 community organizations (e.g., senior centres, YMCA) supports program uptake,  
6  
7 148 implementation, and sustainability [12], which can lead to improved health literacy (i.e., being  
8  
9 149 able to locate, read and understand health information for informed decision-making). In a  
10  
11 150 systematic review of randomized controlled trials (RCTs), health literacy was instrumental in  
12  
13 151 enhancing diabetes knowledge, self-efficacy, and physical activity [21].  
14

15  
16  
17 152 Receiving care from multiple providers from different health and community providers  
18  
19 153 can lead to fragmented care for older adults, as referrals across organizations are often not well  
20  
21 154 integrated [22]. Seamless care coordination and system navigation for older adults with MCC  
22  
23 155 remain high priorities for this population. There is a need for innovative programs for older  
24  
25 156 adults that focus on the Quintuple Aims of high-quality care: (a) enhancing the patient  
26  
27 157 experience of care; (b) creating healthy populations; (c) reducing healthcare costs; (d) improving  
28  
29 158 the care delivery experience; and (e) health equity [23]. Gaps in previous intervention designs  
30  
31 159 include lack of emphasis on patient experience of care and considerations for health equity [23].  
32  
33

34  
35 160 The Aging, Community and Health Research Unit – Community Partnership Program  
36  
37 161 (ACHRU-CPP) is a 6-month self-management intervention for community-living older adults ( $\geq$   
38  
39 162 65 years old), diagnosed with Type 1 or Type 2 diabetes and at least one other chronic condition,  
40  
41 163 and their family/friend caregivers ( $\geq$  18 years old). The intervention was evaluated in a  
42  
43 164 feasibility study in Ontario, Canada [24], followed by a clinical trial in selected primary care and  
44  
45 165 community settings in two Canadian provinces (Ontario and Alberta) [25-27]. A multi-  
46  
47 166 jurisdictional pragmatic RCT is currently in progress to evaluate the implementation and  
48  
49 167 effectiveness of the ACHRU-CPP in three Canadian provinces. To better understand how to  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## BMJ Open

168 address the complex needs of older adults, we sought to assess the experiences and perceived  
 169 impacts of the ACHRUCPP from the perspectives of older adults with diabetes and MCC.

## 170 Methods

### 171 Design

172 This qualitative study is embedded within the multi-site implementation-effectiveness  
 173 type II hybrid RCT, as outlined in the protocol paper [28]. This study used a qualitative  
 174 descriptive design, as described by Sandelowski [29, 30], to provide a fulsome summary while  
 175 remaining close to the words of participants when describing their experiences with the  
 176 ACHRUCPP and its perceived impacts.

### 177 ACHRUCPP Program

178 The ACHRUCPP is delivered by an interprofessional team of primary care providers,  
 179 which includes a Registered Nurse (RN) and Registered Dietitian (RD) or Nutritionist from a  
 180 primary care setting, and a Program Coordinator (e.g., Registered Kinesiologist) from a local  
 181 community partner organization (hereafter referred to as the intervention team). Table 1  
 182 summarizes the core components of the ACHRUCPP. Due to the COVID-19 pandemic some  
 183 participants received virtual visits by phone or videoconferencing. A comparison of results from  
 184 the virtual and in-person approaches will be published in a future paper.

185 **Table 1.** The ACHRUCPP five core components

Intervention Components	Goals
1. Home/virtual visits (up to 3 home visits) and unlimited follow-up phone calls by a RN and/or RD or Nutritionist	To assess older adults' and caregivers' needs and goals using standardized tools to support a coordinated care plan
2. Monthly group wellness sessions (up to 6 sessions) at a local community centre led by the RN, RD or Nutritionist and Community Program Coordinator	To provide older adults and caregivers with gentle progressive physical activity, self-management education for diabetes and other chronic conditions, and healthy lunches and snacks

## BMJ Open

Intervention Components	Goals
3. Monthly team case conferences which include a RN, RD or Nutritionist, and Community Program Coordinator	To discuss the health and social care needs of older adults and caregivers, develop and revise the coordinated care plan, and plan topics for group wellness sessions
4. Collaboration with the primary care interprofessional team and other specialists (e.g., family physicians, nurse practitioners, kinesiologists, social workers, home care and social service providers, pharmacists, endocrinologists)	To support primary care and community providers in working collaboratively to develop care plans for older adults, and connect older adults and caregivers to specialists and community resources
5. Nurse-led care coordination/system navigation	To facilitate linkages to other primary healthcare providers, specialists and community care services for older adults and caregivers

186 *Note.* RN = Registered Nurse; RD = Registered Dietitian

### 187 Patient and Public Involvement

188 The need for the program was originally identified by community-dwelling older adults  
 189 with diabetes and other chronic conditions and their caregivers and was subsequently co-  
 190 designed by older adults in collaboration with primary and community care providers and  
 191 researchers [24]. In the current RCT, patient partners from the pan-Canadian Steering Committee  
 192 were involved in reviewing research questions and advising the research team on the selection of  
 193 outcome measures [28]. Patient and public research partners also participated in local  
 194 Community Advisory Boards in each site to inform further adaptations to the intervention, and  
 195 support local implementation. Patient and public research partners from the local community  
 196 advisory boards (RB, GG, LG, CL, DL, AM) and the Steering Committee (LM, FT) also  
 197 provided input into development of this manuscript by reviewing and interpreting the results and  
 198 helping to shape the key messages.

### 199 Setting

200 The study was conducted in two sites in Ontario, Quebec, and Prince Edward Island,  
 201 Canada. Each of the six sites was selected to ensure variability in geographic setting (urban and

## BMJ Open

202 rural); socio-demographic and cultural backgrounds; language spoken (English or French);  
203 demonstrated support for the ACHRUCPP; and the presence of staff to support intervention  
204 implementation. An RN and RD or Nutritionist from a primary care setting or diabetes education  
205 program worked in partnership with a program coordinator from a local community partner site  
206 (e.g., YMCA) to implement the program.

**207 Sample and Recruitment**

208 Older adults were screened for eligibility to participate in the RCT by a trained staff  
209 member of the primary care site, as described in the study protocol [28]. Eligible patients met the  
210 following inclusion criteria: (a) aged 65 years or older; (b) diagnosis of Type 1 or Type 2  
211 diabetes with at least one other chronic condition; (c) receiving primary care services from one  
212 of the participating primary care settings; (d) living within the area served by the primary care  
213 setting and community site; (e) able to provide informed consent or has a substitute decision-  
214 maker able to provide informed consent on the patient's behalf; and (g) competent in English or  
215 French, or has an interpreter competent in English or French.

216 Following the completion of baseline interviews, patients were randomized to receive the  
217 intervention (i.e., ACHRUCPP) in addition to usual care or usual care alone. A total of 8-10  
218 older adults per site who completed the 6-month intervention were invited to participate in  
219 follow-up telephone interviews. Trained research assistants (MY, RC), with no prior relationship  
220 with participants, used a telephone script to call selected older adults within two weeks of  
221 completing the ACHRUCPP, to invite them to participate in a telephone interview. Maximum  
222 variation purposive sampling [31] was used to select a diverse sample of participants across all 6  
223 sites based on their sex, annual income, ethnicity, and level of participation in all components of  
224 the study.

BMJ Open

**225 Data Collection**

226 Semi-structured post-intervention telephone interviews were conducted between April  
 227 2020 and August 2021. Trained research assistants conducted audio-recorded interviews, ranging  
 228 from 20 to 60 minutes in length, in English or French. Interviews were transcribed verbatim by  
 229 experienced transcriptionists. Interviews conducted in English were transcribed and cleaned by  
 230 trained research staff, while interviews conducted in French were transcribed and translated into  
 231 English by professional transcriptionists and later validated by a bilingual member of the  
 232 research team. Transcripts were not returned to participants for their review. The interview guide  
 233 was created based on: (a) a review of the literature of health and social needs of older adults and  
 234 caregivers, patient-provider communication, and system navigation and (b) feedback from  
 235 patient partners and the research team with expertise in aging, community-based supports for  
 236 older adults and caregivers, and qualitative research. Table 2 provides sample interview  
 237 questions.

**238 Table 2.** Sample interview questions for older adults

<b>Questions for Older Adults</b>
1. What did you need the most in the past six months (e.g., physical, emotional, mental or psychological support, transportation, financial assistance, housekeeping, personal care support)?
2. When [name of nurse and dietitian] visited you what types of things did they do during those visits?
3. For other people who are living with diabetes and other chronic conditions, would you recommend that a nurse or dietitian, such as [name of nurse and dietitian], visit the person at home, make phone calls or both?
4. What types of things did you do at the monthly wellness sessions or during the individual calls with [name of the community program coordinator]?
5. How, if at all, did [name of nurse and dietitian] involve you in decisions about your care?

## BMJ Open

6. How, if at all, did [name of nurse and dietitian] help you to connect with other community health or social services to help you?

7. To what extent did the nurse and dietitian help to address your needs or the issues that were most important to you?

8. How happy are you with the overall care that you received from [name of nurse and dietitian]?

9. Was the information given by [name of nurse and dietitian] and other health professionals about care consistent (across individuals)?

10. Is there anything else about your experiences with [name of nurse and dietitian] that you would like to add that we haven't already discussed?

239

## 240 Data Analysis

241 Themes were generated using the Braun and Clarke's experiential thematic analysis  
 242 framework [32] and organized under relevant constructs of the Consolidated Framework for  
 243 Implementation Research framework. [33]. Thematic analysis was selected to ensure that the  
 244 development of themes was informed by the experiences and perceived intervention benefits of  
 245 older adults. The six phases of thematic analysis include: (a) becoming familiar with the data; (b)  
 246 coding; (c) developing themes; (d) reviewing themes; (e) constructing a definition for themes  
 247 and labelling them; and (f) creating a report [32]. A female research assistant with doctoral level  
 248 training in qualitative research (MY) used the data management software NVivo version 12 [34]  
 249 to perform coding. MY is fluent in both languages and coded in English. Results were shared  
 250 with the team in English only. Following the creation of codes, these were further examined for  
 251 patterns to generate themes. Themes were shared with the research team, including patient  
 252 partners, to ensure they were reflective of the data.

## 253 Rigour and Trustworthiness

254 Consensus was reached by all authors prior to the inclusion of themes in the final report.

BMJ Open

255 Lincoln and Guba's validation criteria [35] were applied in this study to enhance the study's  
 256 rigour. To support the credibility of findings, investigator triangulation was used in data analysis  
 257 through team meetings with 5-7 members to review the coding structure and evidence of themes.  
 258 These members included patient and public research partners and researchers of various  
 259 disciplines with expertise in qualitative research, gerontology, and community-based  
 260 interventions. Conflicts were resolved through team consensus. To facilitate transferability of  
 261 findings, the study sample and setting were described in detail. To support dependability and  
 262 confirmability of findings, the research team kept an audit trail of study processes.

## 263 Results

264 A total of 295 older adults were enrolled in the RCT and randomly allocated to receive  
 265 the ACHRU-CPP or usual care. At the time of data collection, 53 older adults who had  
 266 completed the 6-month intervention were approached to participate in the qualitative interviews  
 267 and 45 accepted (84.91%).

### 268 *Demographic Characteristics*

269 The mean age of the 45 older adults who participated in interviews was 71.1 years. Most  
 270 were female (55.6%), retired from paid work (80%), had Type 2 diabetes (93.3%), and reported  
 271 4-6 chronic conditions (44.4%). Hypertension, hyperlipidemia, and osteoarthritis and other  
 272 arthritis (e.g., rheumatoid arthritis) were the most reported chronic conditions. Table 3  
 273 summarizes demographic characteristics of participants.

274 **Table 3.** Demographic characteristics of interview participants

Older Adults (n=45)	
Category	n (%)
Age (mean [Standard Deviation]): 71.7 [6.5]	
65-70	26 (57.8)
71-75	7 (15.6)
76+	12 (26.7)



## BMJ Open

<b>Older Adults (n=45)</b>	
<b>Category</b>	<b>n (%)</b>
<b>Sex</b>	
Female	25 (55.6)
Male	20 (44.4)
<b>Marital Status</b>	
Married or living with a partner	21 (46.7)
Divorced, never married, separated, or widowed	23 (51.1)
Refused	1 (2.2)
<b>Highest Level of Education</b>	
Completed a graduate or professional degree	6 (13.3)
Completed a bachelor's degree	10 (22.2)
Had some university education or completed a community college, technical college, or postsecondary program	12 (26.7)
Completed secondary school	10 (22.2)
Did not complete secondary school	7 (15.6)
<b>Current Employment Status</b>	
Retired from paid work	36 (80.0)
Employed full-time	4 (8.9)
Employed part-time	2 (4.4)
Unemployed and looking for work	1 (2.2)
Refused	2 (4.4)
<b>Annual Household Income</b>	
\$150,000 or more	2 (4.4)
\$100,000 or more, but less than \$150,000	2 (4.4)
\$50,000 or more, but less than \$100,000	12 (26.7)
\$20,000 or more, but less than \$50,000	16 (35.6)
Less than \$20,000	11 (24.4)
Refused	2 (4.4)
<b>Born in Canada</b>	
Yes	31 (68.9)
<b>Ethnic/Racial Group</b>	
White/Caucasian	32 (71.1)
Black	3 (6.7)
Caribbean/Guyanese	3 (6.7)
Filipino	2 (4.4)
First Nations	1 (2.2)
South Asian	1 (2.2)
Southeast Asian	1 (2.2)
Chinese	1 (2.2)
Japanese	1 (2.2)
<b>Language(s) Spoken</b>	
English	37 (82.2)
French	15 (33.3)

## BMJ Open

Older Adults (n=45)	
Category	n (%)
Living with Others (e.g., spouse, children, other relative, friend, group setting)	
Yes	27 (60.0)
Type of Diabetes	
Type 1 diabetes	1 (2.2)
Type 2 diabetes	42 (93.3)
Unknown	2 (4.4)
Number of Chronic Conditions (mean [Standard Deviation]): 5.6 [2.9]	
1-3	11 (24.4)
4-6	20 (44.4)
7-9	8 (17.8)
10 +	6 (13.3)
Commonly Reported Chronic Conditions	
Hypertension	34 (75.6)
Hyperlipidemia	27 (60.0)
Osteoarthritis and other arthritis	18 (40.0)
Cardiovascular disease	16 (35.6)
At Least 1 Emergency Room Visit in the Last 6 Months	
6 months prior to ACHRUCPP	8 (17.8)
6-month follow-up	7 (15.6)

275

276 **Themes**

277 Themes were grouped into two categories, experiences, and perceived impacts of the  
 278 ACHRUCPP. Table 4 provides an overview of themes. The words in italics that label the theme  
 279 are taken verbatim from transcripts. Similarly, participant quotes in the narrative that follows are  
 280 noted in italics and identified by OA for older adult, # for site number, and ### for participant  
 281 number.

282 **Table 4.** Themes of older adult experiences and perceived impacts with the ACHRUCPP

283

Experiences with the ACHRUCPP
<ul style="list-style-type: none"> <li>• In-depth dialogue with “<i>professional friends</i>”</li> <li>• Socialized with “<i>people with the same type of health problems</i>”</li> <li>• Person-centred care by “<i>more than one knowledgeable person</i>”</li> </ul>

## BMJ Open

- Ongoing contact with providers so “*you are not alone*”
- Need to address ethnic/cultural differences through a “*personal session*”

**Perceived Impacts of the ACHRUCPP**

- Improved diabetes self-management behaviours: “*make more proactive steps*”
- Added connection to health and social support services “*that could help me*”

284

**Experiences with the ACHRUCPP**

286 Overall, older adults reported positive experiences with the ACHRUCPP. They  
 287 experienced: (a) in-depth dialogue with “*professional friends*”; (b) socialized with “*people with*  
 288 *the same type of health problems*”; (c) person-centred care by “*more than one knowledgeable*  
 289 *person*”; (d) ongoing contact with providers so “*you are not alone*”; and identified the (e) need  
 290 to address ethnic/cultural differences: “*eating has to do with seasons*”.

291 **In-depth dialogue with “*professional friends*”.** In-person home and virtual visits were  
 292 perceived by older adults as more relaxed compared to clinic visits and provided opportunities  
 293 for in-depth dialogue about health and social issues with providers. “*The home visits are more*  
 294 *relaxed, if you were at a clinic, you got a time slot you got to meet whatever is transacted in that*  
 295 *timeframe*” (OA\_1\_152). Home visits helped to build trust between older adults and the  
 296 providers, which facilitated the exploration of concerns and needs beyond diabetes such as safe  
 297 housing and transportation issues. “*I felt I could trust her [nutritionist]*” (OA\_5\_037). Providers  
 298 were approachable and understanding of older adults’ situations and were considered as friends  
 299 and confidants. “*They [providers] were professional friends*” (OA\_2\_242). Their approach was  
 300 especially important when discussing sensitive topics such as mental health concerns. “*I had my*

BMJ Open

1  
2  
3 301 *sick niece calling me and that was stressing me, so she [nurse] said to “Let go. When we are*  
4  
5 302 *stressed, that’s not always good”*. So how to manage my stress” (OA\_6\_023).

7 303 **Socialized with “people with the same type of health problems”**. Older adults and  
9  
10 304 caregivers perceived that group wellness sessions helped them meet others who understood what  
11  
12 305 it is like to live with diabetes and other chronic conditions. “*The fact of socializing with other*  
13  
14 306 *people with the same types of health problems as we do”* (OA\_5\_037). The sessions provided  
15  
16 307 opportunities for group exercises which provided peer motivation. The group sessions were  
17  
18 308 particularly helpful for older adults who were socially isolated, and some older adults became  
19  
20 309 friends because of the sessions.

22 310 **Person-centred care by “more than one knowledgeable person”**. Older adults  
23  
24 311 appreciated that they received person-centred care from a team of providers through the  
25  
26 312 ACHRU-CPP to discuss diabetes, their other chronic conditions, and social concerns. Older  
27  
28 313 adults valued providers working collaboratively to meet their needs. “*It was good that they*  
29  
30 314 *worked in a team. More than one knowledgeable person. That was important”* (OA\_2\_242).  
31  
32 315 They felt that providers were listening to their concerns and that, prior to meeting with the  
33  
34 316 intervention team, it was difficult to find the right person to talk to about diabetes.

35  
36 317 *I enjoyed having them come to visit. I don’t talk to a lot of people about my diabetes because*  
37  
38 318 *I don’t feel it’s that complicated, but nobody really wants to listen about your health issues.*  
39  
40 319 (OA\_3\_032)

41  
42 320 Providers supported the management of other conditions in addition to diabetes. “*I was having*  
43  
44 321 *troubles with my bowels, but we got that regulated and it’s good”* (OA\_4\_075).

45  
46 322 **Ongoing contact with providers so “you are not alone”**. Providers made older adults  
47  
48 323 feel that someone was concerned about their well-being. “*It’s not as if we are just left alone with*  
49  
50 324 *our problems. What you are doing is very good; continue”* (OA\_5\_128). Follow-up phone calls  
51  
52 325

## BMJ Open

1  
2  
3 326 were well received by older adults, especially by those living alone or with little support, and  
4  
5 327 ensured that they “*haven’t fallen through the cracks*” (OA\_3\_058). The ongoing follow-up with  
6  
7  
8 328 the team reinforced familiar information that older adults had forgotten to put into practice over  
9  
10 329 time.

11  
12 330 **Need to address ethnic/cultural differences through a “*personal session*”.** Some  
13  
14 331 ethnic groups may have language barriers and be “*very shy and they don’t approach people*  
15  
16 332 *unless someone else pushes them to go [join programs]*” (OA\_1\_061). Some older adults  
17  
18 333 perceived that individual wellness sessions with providers may be helpful for those with  
19  
20 334 language barriers. “*Some of them had a bit of a language problem. I think a personal session*  
21  
22 335 *would be much more helpful*” (OA\_2\_086). There is a need to allow dedicated time for older  
23  
24 336 adults to share their cultural practices during interactions with peers and the intervention team.

25  
26  
27  
28 337 *One of the things I learned about myself from my community [Indigenous community] and*  
29 338 *my family is that eating has to do with seasons...Your year-round diet has to do with what’s*  
30 339 *available to you...I mentioned that one time in the group [Group Wellness Sessions]and they*  
31 340 *thought that had nothing to do with what the topics were.* (OA\_2\_013)

32 341  
33 342 ***Perceived Impacts***

34  
35  
36 343 Older adults perceived that the ACHRU-CPP had positive impacts on their health and  
37  
38 344 well-being as a result of: (a) improved diabetes self-management behaviours: “*make more*  
39  
40 345 *proactive steps*” and (b) added connection to health and social support services “*that could help*  
41  
42 346 *me*”.

43  
44  
45 347 **Improved diabetes self-management behaviours: “*make more proactive steps*”.** Older  
46  
47 348 adults felt that the ACHRU-CPP helped them to take more action in preventing hypoglycemia  
48  
49 349 and hyperglycemia and decreasing their blood pressure. They reported that providers helped  
50  
51 350 them to be alert to complications that can arise from poor diabetes care.

52  
53  
54  
55 351 *What [the nurse] and [dietitian] caused me to be concerned about is to make more proactive*

## BMJ Open

352 *steps, to watch out for those low blood sugars. I really didn't realize how badly they could*  
353 *affect you. Shaking and double vision is one thing but not being able to drive, that's quite*  
354 *another thing. (OA\_2\_242)*

356 Older adults indicated that they gained nutritional knowledge by participating in the  
357 ACHRU-CPP. *"I improved it [eating habits]. I had to eat more fruit and vegetables...and after*  
358 *that, I had to hydrate myself more and add more fibre to my diet"* (OA\_5\_027). Older adults  
359 perceived that changes made to their diet could lead to multiple benefits including weight loss  
360 and decreased sugar levels. *"...drinking more water and diet, I think that's what was important,*  
361 *and I lost weight at the same time. By eating well, fewer treats, being more careful, the sugar*  
362 *levels were lower"* (OA\_6\_005).

363 Older adults perceived they were able to build more muscle mass and lose weight and  
364 experienced less difficulty in climbing stairs. Some older adults felt that they were not exercising  
365 enough prior to participating in the ACHRU-CPP and perceived that the providers helped them  
366 to meet their activity goals.

367 *They really helped me with the exercise piece. I had poor balance. It was the [nurse and*  
368 *dietitian] that really said 'why don't you try doing this? I'll give you a call this week and see*  
369 *if you got out to do your walk', and then I'd promise them that I would start journaling my*  
370 *steps so little by little I started increasing my exercise. (OA\_2\_247)*

372 **Added connection to health and social support services "that could help me".** Older  
373 adults indicated that they were referred to and connected with health and social support services  
374 (e.g., food bank, exercise program, smoking cessation, home care, social work, arts program).  
375 Some older adults required supports to meet their basic needs, as they were not able to afford  
376 groceries or travel far distances for groceries and medications. *"She [nurse] referred me [for*  
377 *medication delivery]"* (OA\_1\_061). Some older adults required mental health support to enhance  
378 their ability to manage diabetes and other chronic conditions. The intervention team followed-up  
379 with older adults after making referrals to ensure that they were connected. Older adults were

## BMJ Open

1  
2  
3 380 referred to local community resources that offered free or low-cost services. “*They told me I*  
4  
5 381 *could go to [name of community centre] to do exercise*” (OA\_4\_016). Prior to participating in  
6  
7 382 the ACHRU-CPP older adults indicated that they had seldom been referred to programs outside  
8  
9 383 of the clinic and therefore they were not aware of available community resources.

10  
11  
12 384 Older adults found it important to be aware of publicly-funded resources, such as tax  
13  
14 385 rebates and housing options, in case they or their loved one required these in the future. By  
15  
16 386 attending group wellness sessions, they learned about the types of programs the community  
17  
18 387 partner sites had to offer. “*They [community partner site] have virtual classes and they’re all*  
19  
20 388 *free. They have special classes just for seniors*” (OA\_2\_013).

### 389 Discussion

24  
25  
26 390 Key findings of this study were that the ACHRU-CPP increased in-depth dialogue with  
27  
28 391 ‘*professional friends*’ and provided person-centred care and ongoing contact with providers to  
29  
30 392 prevent feelings of being alone. Group interactions brought together participants with the same  
31  
32 393 type of health issues and provided peer motivation. Participants identified that the program  
33  
34 394 would benefit from adaptations to address cultural and language differences among older adults  
35  
36 395 living with diabetes and other conditions in Canada.

37  
38  
39 396 A novel finding of this study was that the ACHRU-CPP was perceived by older adults  
40  
41 397 from three Canadian provinces to positively impact their self-management practices of diabetes  
42  
43 398 and MCC by helping to address their broad health and social needs. This has not been  
44  
45 399 documented before in similar studies [19, 20]. This may be because the ACHRU-CPP was longer  
46  
47 400 and more person-centred compared to other interventions. Interventionists were able to directly  
48  
49 401 assess the home context and understand the impacts of social determinants of health. Mental  
50  
51 402 health concerns and lack of support can impact the ability of older adults to effectively manage

## BMJ Open

1  
2  
3 403 diabetes and lead to severe hypoglycemia, elevated HbA1c levels, a greater number of missed  
4  
5 404 insulin doses, and a higher risk for diabetic ketoacidosis and mortality [36, 37, 3].

6  
7  
8 405 When healthcare providers recommend lifestyle changes, they need to recognize that  
9  
10 406 social determinants of health such as housing, food security, social relationships, and financial  
11  
12 407 stability have an impact on older adults' abilities to enact them [38]. In the current study, the  
13  
14 408 intervention team assessed the social determinants of health and found ways to address them,  
15  
16 409 such as by linking older adults with relevant community resources, to help overcome barriers to  
17  
18 410 self-management. The intervention team targeted health literacy of older adults and caregivers  
19  
20 411 through education, capacity building, and opportunities for dialogue among peers and experts.  
21  
22 412 Community-based interventions were found to be most effective for Type 2 diabetes self-  
23  
24 413 management compared to other interventions [21].

25  
26  
27  
28 414 In the current study, older adults appreciated receiving person-centred care supported by  
29  
30 415 a team of providers from primary care and community sectors and the engagement of providers  
31  
32 416 outside of the intervention team (such as social workers). Due to the complex nature of diabetes  
33  
34 417 and MCC, interprofessional collaboration has been found to lead to positive outcomes for  
35  
36 418 persons with Type 2 diabetes, such as improvements in HbA1c levels, regular testing of blood  
37  
38 419 glucose levels, and smoking cessation [39, 40].

39  
40  
41  
42 420 What is unique about this study is the partnership between healthcare providers and a  
43  
44 421 Program Coordinator from a local community partner site. These health and social services can  
45  
46 422 be underutilized if healthcare providers are not aware of them. As per the Quintuple Aim [23]  
47  
48 423 there is a need to optimize the use of existing community-based services for patients, address any  
49  
50 424 barriers to accessing these services, and for strong coordination of services [41].  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



## BMJ Open

1  
2  
3 425 Person-centred care was perceived to be key strength of the ACHRU-CPP that enabled  
4  
5 426 older adults to improve self-management practices related to diabetes and MCC. In working  
6  
7 427 towards a person-centred learning health system, defined as a health system that integrates  
8  
9 428 internal data, patient experience, and research evidence [42], the priorities and experiences of  
10  
11 429 older adults should be regularly reported in data systems so that services that meet their needs are  
12  
13 430 developed and evaluated as part of continuous quality improvement processes [38]. As seen in  
14  
15 431 this study, patient experience can be improved by having a provider connect patients with other  
16  
17 432 interdisciplinary health and social care providers to ensure that smooth transitions between  
18  
19 433 services occur [43].  
20  
21  
22  
23

24 434 In practice and policy, there is a need for integrated care delivery models that leverage  
25  
26 435 community partnerships to help fill gaps in meeting the complex health and social needs of older  
27  
28 436 adults with diabetes. To advance Quintuple Aim outcomes [23], it is critical to assess patient  
29  
30 437 experiences with receiving healthcare services as part of intervention research and practice to  
31  
32 438 improve health system performance. The strengths of the study include its rigorous qualitative  
33  
34 439 design and large sample size, and the inclusion of diverse participants with regards to sex,  
35  
36 440 marital status, and annual income from multiple sites across Canada. A limitation of the study is  
37  
38 441 the lack of cultural diversity and under-representation of older adults from marginalized  
39  
40 442 communities. A Diabetes Canada roundtable of key stakeholders recently emphasized the need  
41  
42 443 to implement community-based interventions [44], such as the ACHRU-CPP, to better support  
43  
44 444 older adults with diabetes and MCC living in marginalized communities. The need for  
45  
46 445 community-based interventions is based on the premise that racial and socioeconomic disparities  
47  
48 446 disproportionately affect them and put them at an increased risk for diabetes complications and  
49  
50 447 mortality [45].  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

BMJ Open

**Conclusion**

Overall, older adults with diabetes and MCC reported a positive experience and felt that the ACHRU-CPP had a positive impact in supporting diabetes self-management. Study findings reveal the need to ensure that older adults receive ongoing support and contact with a collaborative team of primary care and community providers to better meet the complex needs associated with daily self-management of diabetes and MCC. Results also shine light on the broader social context that constitutes the life world of older adults and how chronic disease self-management interventions need to address these contexts comprehensively through tailoring to individual circumstances. It is our hope that these findings will help usher in a new era of contextually informed person-centred care.

471 **Acknowledgements**

472 We thank the older adults and caregivers who participated in this study, as well as the  
473 nurses, dietitians, nutritionists and community program coordinators who provided the  
474 intervention. We also thank the managers of intervention teams, the recruiters, research  
475 assistants, and the study sites for their support of this study. Thanks to Robyn Connors for  
476 conducting interviews with study participants. We thank the research team in the Aging,  
477 Community and Health Research Unit (<https://achru.mcmaster.ca/>) for supporting this study. We  
478 would also like to thank the Community Advisory Board members, including people with lived  
479 experience with diabetes, who supported local implementation of the project in each province.

480 We acknowledge the following authors who are members of the **ACHRU-CPP**

481 **Research Team: Jenny Ploeg**, School of Nursing, Faculty of Health Sciences, McMaster  
482 University, Hamilton, Ontario, Canada; **Maureen Markle-Reid**, School of Nursing, Faculty of  
483 Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Ruta Valaitis**, School of  
484 Nursing, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada;  
485 **Kathryn Fisher**, School of Nursing, Aging, Community and Health Research Unit, Faculty of  
486 Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Rebecca Ganann**, School of  
487 Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster  
488 University, Hamilton, Ontario, Canada; **Johanne Blais**, Department of Family Medicine and  
489 Emergency Medicine, Faculty of Medicine, Université Laval, Quebec City, Quebec; **Andrea**  
490 **Gruneir**, Department of Family Medicine Research Program, University of Alberta, Edmonton,  
491 Alberta, Canada; **France Légaré**, VITAM-Centre de recherche en santé durable, Université  
492 Laval, Quebec City, Quebec, Canada; **Janet MacIntyre**, Faculty of Nursing, University of  
493 Prince Edward Island, Charlottetown, Prince Edward Island, Canada; **William Montelpare**,

BMJ Open

1  
2  
3 494 Department of Applied Human Sciences, Faculty of Science, University of Prince Edward  
4  
5 495 Island, Prince Edward Island, Canada; **Jean-Sébastien Paquette**, Department of Family  
6  
7 496 Medicine and Emergency Medicine, Faculty of Medicine Université Laval, Québec, Canada;  
8  
9 497 **Marie-Eve Poitras**, Department of Family Medicine and Emergency Medicine, Faculty of  
10  
11 498 Medicine and Health Sciences, Université de Sherbrooke Chicoutimi, Quebec, Canada; **Angela**  
12  
13 499 **Riveroll**, Department of Applied Human Sciences, Faculty of Science, University of Prince  
14  
15 500 Edward Island, Charlottetown, Prince Edward Island, Canada, **Ali Ben Charif**, CubecXpert,  
16  
17 501 Quebec City, Quebec, Canada; **Dean Eurich**, School of Public Health, University of Alberta,  
18  
19 502 Edmonton, Alberta, Canada; **Amiram Gafni**, Department of Health Research Methods,  
20  
21 503 Evidence and Impact, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
22  
23 504 Canada; **Gary Lewis**, Department of Medicine and Department of Physiology, University of  
24  
25 505 Toronto, Toronto, Ontario, Canada; **Lynne Mansell**, Patient/Public Research Partner, Alberta,  
26  
27 506 Canada; **Melissa Northwood**, School of Nursing, Aging, Community and Health Research Unit,  
28  
29 507 Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Janet Pritchard**,  
30  
31 508 Interdisciplinary Science and Kinesiology, Faculty of Science, McMaster University, Hamilton,  
32  
33 509 Ontario, Canada; **Cheryl Sadowski**, Faculty of Pharmacy and Pharmaceutical Sciences,  
34  
35 510 University of Alberta, Edmonton, Alberta, Canada; **Diana Sherifali**, School of Nursing, Faculty  
36  
37 511 of Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Frank Tang**,  
38  
39 512 Patient/Public Research Partner, Ontario, Canada; **Lehana Thabane**, Department of Health  
40  
41 513 Research Methods, Evidence and Impact, Faculty of Health Sciences, McMaster University,  
42  
43 514 Hamilton, Ontario, Canada; **Ross Upshur**, Bridgepoint Active Healthcare, Toronto, Ontario,  
44  
45 515 Canada; **Tyler Williamson**, Centre for Health Informatics, Cumming School of Medicine and  
46  
47 516 Department of Community Health Sciences, University of Calgary, Calgary, Alberta, Canada;  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

BMJ Open

517 **Marie-Lee Yous**, School of Nursing, Faculty of Health Sciences, McMaster University,  
518 Hamilton, Ontario, Canada.

### Author Contributions

520 Conceptualization: JP, MMR, RV, KF, RG, FL, WM.

521 Formal Analysis: MLY, RG, TC, JP.

522 Funding Acquisition: JP, MMR, RV, KF, RG, AG, FL, JM, WM.

523 Investigation: JP, MMR, RV, KF, RG, TC, FL, WM, MLY.

524 Methodology: JP, MMR, RV, KF, RG, MLY, FL, WM.

525 Project Administration: JP, MMR, RV, TC, FL, WM.

526 Resources: JP, MMR, RV, FL, WM.

527 Supervision: JP, MMR, RV, RG, TC, FL, WM.

528 Validation: MLY, JP, MMR, RV, KF, RG, TC, RC.

529 Writing – Original Draft: MLY.

530 Writing – Review and Editing: MLY, RG, TC, JP, MMR, RV, KF, FL, JM, WM. The authors  
531 read and approved the final manuscript.

### Funding

532  
533 This study is supported, in part, by funding from the Canadian Institutes of Health  
534 Research Strategy for Patient-Oriented Research (SPOR) Primary and Integrated Health Care  
535 Innovations Network: Programmatic Grants (Funding Reference Number: KPG-156883) in  
536 partnership with: Diabetes Action Canada, a Canadian Institutes for Health Research (CIHR)  
537 Strategy for Patient-Oriented Research Network in Chronic Disease (project reference  
538 #1.1.1ACHR); McMaster Institute for Research on Aging (Hamilton, ON); McMaster University  
539 School of Nursing; Réseau-1 Québec; Fonds de Recherche du Québec (FRQS); Scarborough

BMJ Open

1  
2  
3 540 Health Network Foundation. This research was also undertaken, in part, thanks to the funding  
4  
5 541 from Dr. Markle-Reid's Tier 2 CIHR Canada Research Chair. The study was investigator-  
6  
7 542 initiated. The funders of this study had no role in study design, data collection, data analysis, data  
8  
9 543 interpretation or writing the manuscript.  
10  
11

### 12 544 **Competing Interests**

13  
14  
15 545 None declared.  
16

### 17 546 **Availability of Data and Materials**

18  
19 547 The data for this research consists of questionnaires and interviews. Raw data cannot be  
20  
21 548 publicly released due to the risk of compromising participant confidentiality  
22  
23

### 24 549 **Ethics Statement**

25  
26 550 Institutional ethics approval was obtained from the following: the Hamilton Integrated  
27  
28 551 Research Ethics Board (#5101); the Scarborough Health Network Research Ethics Board (#NEP-  
29  
30 552 18-014); the Unity Health Toronto Research Ethics Board (#18-336); University of Prince  
31  
32 553 Edward Island Research Ethics Board (#6008019); Prince Edward Island Research Ethics Board  
33  
34 554 (#6008019); and Centre intégré universitaire de santé et de services sociaux (CIUSSS) de la  
35  
36 555 Capitale-Nationale (MP-13-2019-1670). Trained research assistants obtained informed consent  
37  
38 556 from all older adult participants prior to their participation in the study, and all participants  
39  
40 557 received a copy of their consent form, in person or by mail. All participants gave permission to  
41  
42 558 audio-record their interview. All participant information was kept confidential in a secure  
43  
44 559 location (e.g., locked cabinet in a secured office, password-protected encrypted electronic  
45  
46 560 folders), and data were de-identified using unique study IDs. Participants who completed a  
47  
48 561 qualitative interview received a \$25.00 gift card as an honorarium.  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

562

## References

- [1] World Health Organization. Diabetes. Available from: <https://www.who.int/en/news-room/fact-sheets/detail/diabetes>. 2022. Accessed 3 Jan 2022.
- [2] Kirkman MS, Briscoe VJ, Clark N, et al. Diabetes in older adults: A consensus report. *J Am Geriatr Soc* 2012;35(12):2650-64.
- [3] Dhaliwal R, Weinstock RS. Management of type 1 diabetes in older adults. *Diabetes Spectr*. 2014;27(1):9-20.
- [4] Sinnige J, Braspenning J, Schellevis F, et al. The prevalence of disease clusters in older adults with multiple chronic diseases—a systematic literature review. *PloS one* 2013;8(11):e79641.
- [5] Lin PJ, Kent DM, Winn A, et al. Multiple chronic conditions in type 2 diabetes mellitus: prevalence and consequences. *Am J Manag Care* 2015;21(1):e23-34.
- [6] Fisher K, Griffith L, Gruneir A, et al. Comorbidity and its relationship with health service use and cost in community-living older adults with diabetes: A population-based study in Ontario, Canada. *Diabetes Res Clin Pract* 2016;122:113-123.
- [7] Willi C, Bodenmann P, Ghali WA, et al. Active smoking and the risk of type 2 diabetes: A systematic review and meta-analysis. *JAMA* 2007; 298:2654-64.
- [8] Ploeg J, Matthew-Maich N, Fraser K, et al. Managing multiple chronic conditions in the community: A Canadian qualitative study of the experiences of older adults, family caregivers and healthcare providers. *BMC Geriatr* 2017;17.
- [9] The Change Foundation. Family caregiver assessment in health care settings, summary of the change foundation's literature review and environment scan project. Toronto, August 2016.
- [10] McGilton KS, Vellani S, Yeung L, et al. Identifying and understanding the health and social care needs of older adults with multiple chronic conditions and their caregivers: A scoping review. *BMC Geriatr* 2018;18(1):1-33.
- [11] Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ*. 2008;337:1-6.
- [12] Whittemore R. A systematic review of the translational research on the diabetes prevention program. *Transl Behav Med* 2011;1:480-91.
- [13] Tuomilehto J, Schwarz P, Lindström J. Long-term benefits from lifestyle interventions for type 2 diabetes prevention: Time to expand the efforts. *Diabetes Care* 2011;34:S210-14.
- [14] Smith SM, Wallace E, O'Dowd T, et al. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database Syst Rev* 2016;3.
- [15] Yoon U, Kwok LL, Magkidis A. Efficacy of lifestyle interventions in reducing diabetes incidence in patients with impaired glucose tolerance: A systematic review of randomized controlled trials. *Metabolism* 2013;62:303-14.
- [16] Busetto L, Luijkx KG, Elissen AMJ, et al. Context, mechanisms and outcomes of integrated care for diabetes mellitus type 2: A systematic review. *BMC Health Serv Res* 2016;16:1-14.
- [17] Diabetes Prevention Program Research Group. 10-year follow-up of diabetes incidence and weight loss in the diabetes prevention program outcomes study. *Lancet* 2009;374:1677-86.
- [18] Wong KC, Wong FKY, Yeung W, et al. The effect of complex interventions on supporting self-care among community-dwelling older adults: A systematic review and meta-analysis. *Age Ageing* 2017;1-9.

- 1  
2  
3 606 [19] Azami G, Soh KL, Sazlina SG, et al. Effect of a nurse-led diabetes self-management  
4 607 education program on glycosylated hemoglobin among adults with type 2 diabetes. *J Diabetes*  
5 608 *Res* 2018;1-13.
- 6 609 [20] Chow SK, Wong FK. A randomized controlled trial of a nurse-led case management  
7 610 programme for hospital-discharged older adults with co-morbidities. *J Adv Nurs*  
8 611 2014;70(10):2257-71.
- 9 612 [21] Dahal PK, Hosseinzadeh H. Association of health literacy and diabetes self-management: A  
10 613 systematic review. *Aust J Prim Health* 2020;25(6):526-33.
- 11 614 [22] Ferris R, Blaum C, Kiwak E, et al. Perspectives of patients, clinicians, and health system  
12 615 leaders on changes needed to improve the health care and outcomes of older adults with multiple  
13 616 chronic conditions. *J Aging Health* 2018;30(5):778-99.
- 14 617 [23] Nundy S, Cooper LA, Mate KS. The Quintuple Aim for health care improvement: A new  
15 618 imperative to advance health equity. *JAMA* 2022;327(6):521-522.
- 16 619 [24] Markle-Reid M, Ploeg J, Fisher K, et al. The Aging, Community and Health Research  
17 620 Unit—Community Partnership Program for older adults with type 2 diabetes and multiple  
18 621 chronic conditions: A feasibility study. *Pilot Feasibility Stud* 2016 2(1):24.
- 19 622 [25] Markle-Reid M, Ploeg J, Fraser KD, et al. Community program improves quality of life and  
20 623 self-management in older adults with diabetes mellitus and comorbidity. *J Am Geriatr Soc*. 2018  
21 624 Feb;66(2):263-73.
- 22 625 [26] Miklavcic JJ, Fraser KD, Ploeg J, Markle-Reid M, Fisher K, Gafni A, Griffith LE, Hirst S,  
23 626 Sadowski CA, Thabane L, Triscott JA. Effectiveness of a community program for older adults  
24 627 with type 2 diabetes and multimorbidity: A pragmatic randomized controlled trial. *BMC Geriatr*.  
25 628 2020 Dec;20(1):1-14.
- 26 629 [27] Fisher K, Markle-Reid M, Ploeg J, Bartholomew A, Griffith LE, Gafni A, Thabane L, Yous  
27 630 ML. Self-management program versus usual care for community-dwelling older adults with  
28 631 multimorbidity: A pragmatic randomized controlled trial in Ontario, Canada. *J Comorb*. 2020  
29 632 Oct 14;20(174):1-14.
- 30 633 [28] Ploeg J, Markle-Reid M, Valaitis R, et al. The Aging, Community and Health Research Unit  
31 634 Community Partnership Program for older adults with diabetes and multiple chronic conditions:  
32 635 Study protocol for a randomized controlled trial. *BMC Geriatrics* 2022;22(99):1-22.
- 33 636 [29] Sandelowski M. Whatever happened to qualitative description? *Res Nurs health*.  
34 637 2000;23(4):334-40.
- 35 638 [30] Sandelowski M. What's in a name? Qualitative description revisited. *Res Nurs Health*. 2010  
36 639 Feb;33(1):77-84.
- 37 640 [31] Patton MQ. Qualitative evaluation and research methods. Beverly Hills, CA: SAGE, 1990.
- 38 641 [32] Braun V, Clarke V. Successful qualitative research: A practical guide for beginners.  
39 642 London, England: SAGE, 2013.
- 40 643 [33] Damschroder LJ, Aron DC, Keith RE, et al. Fostering implementation of health services  
41 644 research findings into practice: A consolidated framework for advancing implementation  
42 645 science. *Implement Sci*. 2009 Dec;4(1):1-5.
- 43 646 [34] QSR International Pty Ltd. NVivo (Version 12). 2018. Available from:  
44 647 <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>
- 45 648 [35] Lincoln YS, Guba EG. Naturalistic inquiry. Sage Publications, 1985.
- 46 649 [36] Robinson DJ, Coons M, Haensel H, et al. Diabetes and mental health. *Can J Diabetes* 2018  
47 650 Apr 1;42:S130-41.



## BMJ Open

- 1  
2  
3 651 [37] Lynch CP, Gebregziabher M, Zhao Y, et al. Impact of medical and psychiatric multi-  
4 652 morbidity on mortality in diabetes: emerging evidence. *BMC Endocr Disord* 2014;14(1):1-8.  
5 653 [38] Kuluski K, Guilcher SJ. Toward a person-centred learning health system: Understanding  
6 654 value from the perspectives of patients and caregivers. *Healthc Pap* 2019;18(4):36-46.  
7 655 [39] Hellquist K, Bradley R, Grambart S, et al. Collaborative practice benefits patients: An  
8 656 examination of interprofessional approaches to diabetes care. *Health Interprofessional Pract*  
9 657 2012;1(eP1017).  
10 658 [40] O'Connor PJ, Desai J, Solberg LI, et al. Randomized trial of quality improvement  
11 659 intervention to improve diabetes care in primary care settings. *Diabetes Care* 2005;28,1890-97.  
12 660 [41] Valaitis RK, Wong ST, MacDonald M, et al. Addressing quadruple aims through primary  
13 661 care and public health collaboration: ten Canadian case studies. *BMC Public Health*  
14 662 2020;20(1):1-6.  
15 663 [42] Agency for Healthcare Research and Quality. About learning health systems. 2019.  
16 664 Available from: <https://www.ahrq.gov/learning-health-systems/about.html>. Accessed 12 Feb  
17 665 2022.  
18 666 [43] Rapid Improvement Support and Exchange. RISE brief 1. OHT (Ontario Health Team)  
19 667 building blocks. 2019. Available from: [https://www.mcmasterforum.org/docs/default-](https://www.mcmasterforum.org/docs/default-source/rise-docs/rise-briefs/rb1_oht-building-blocks.pdf?sfvrsn=71b154d5_27)  
20 668 [source/rise-docs/rise-briefs/rb1\\_oht-building-blocks.pdf?sfvrsn=71b154d5\\_27](https://www.mcmasterforum.org/docs/default-source/rise-docs/rise-briefs/rb1_oht-building-blocks.pdf?sfvrsn=71b154d5_27). Accessed 12 Feb  
21 669 2022.  
22 670 [44] Diabetes Canada. Summary of Diabetes Canada Diabetes 360° Ontario roundtable. 2019.  
23 671 Available from: [https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-](https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy_Roundtable-Summary_FINAL.pdf)  
24 672 [Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy\\_Roundtable-](https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy_Roundtable-Summary_FINAL.pdf)  
25 673 [Summary\\_FINAL.pdf](https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy_Roundtable-Summary_FINAL.pdf). Accessed 12 Feb 2022.  
26 674 [45] Clements JM, West BT, Yaker Z, et al. Disparities in diabetes-related multiple chronic  
27 675 conditions and mortality: The influence of race. *Diabetes Res Clin Pract* 2020;159(107984):1-  
28 676 19.  
29 677  
30  
31  
32  
33  
34  
35 678  
36  
37  
38 679  
39  
40 680  
41  
42 681  
43  
44 682  
45  
46 683  
47  
48 684  
49  
50 685  
51  
52 686  
53  
54  
55  
56  
57  
58  
59  
60

## COREQ (CONsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
<b>Domain 1: Research team and reflexivity</b>			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	
Occupation	3	What was their occupation at the time of the study?	
Gender	4	Was the researcher male or female?	
Experience and training	5	What experience or training did the researcher have?	
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	
<b>Domain 2: Study design</b>			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	
Sample size	12	How many participants were in the study?	
Non-participation	13	How many people refused to participate or dropped out? Reasons?	
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	
<i>Data collection</i>			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	
Repeat interviews	18	Were repeat interviews carried out? If yes, how many?	
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	
Field notes	20	Were field notes made during and/or after the interview or focus group?	
Duration	21	What was the duration of the interviews or focus group?	
Data saturation	22	Was data saturation discussed?	
Transcripts returned	23	Were transcripts returned to participants for comment and/or	

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
<b>Domain 3: analysis and findings</b>			
<i>Data analysis</i>			
Number of data coders	24	How many data coders coded the data?	
Description of the coding tree	25	Did authors provide a description of the coding tree?	
Derivation of themes	26	Were themes identified in advance or derived from the data?	
Software	27	What software, if applicable, was used to manage the data?	
Participant checking	28	Did participants provide feedback on the findings?	
<i>Reporting</i>			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	
Data and findings consistent	30	Was there consistency between the data presented and the findings?	
Clarity of major themes	31	Were major themes clearly presented in the findings?	
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

**Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.**

# BMJ Open

## Older Adults' Experiences and Perceived Impacts of the Aging, Community and Health Research Unit – Community Partnership Program (ACHRU-CPP) for Diabetes Self-Management in Canada: A Qualitative Descriptive Study

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2022-068694.R1
Article Type:	Original research
Date Submitted by the Author:	11-Feb-2023
Complete List of Authors:	<p>Yous, Marie-Lee; McMaster University Faculty of Health Sciences, School of Nursing            Ganann, Rebecca; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Ploeg, Jenny ; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Markle-Reid, Maureen; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Northwood, Melissa ; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Fisher, Kathryn ; McMaster University School of Nursing, School of Nursing, Aging, Community and Health Research Unit            Valaitis, Ruta; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Chambers, Tracey; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Montelpare, William; University of Prince Edward Island, Department of Applied Human Sciences, Faculty of Science            Légaré, France; VITAM Centre de recherche en santé durable; Laval University, Department of Family and Emergency Medicine, Faculty of Medicine            Beleno, Ron; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Gaudet, Gary; University of Prince Edward Island            Giacometti, Luisa; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Lively, Deborah; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Lindsay, Craig; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Morrison, Allan; University of Prince Edward Island            Tang, Frank; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            ACHRU-CPP Research Team, on behalf of the; McMaster University Faculty of Health Sciences, School of Nursing</p>
<b>Primary Subject Heading</b>:	Diabetes and endocrinology

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Secondary Subject Heading:	Qualitative research
Keywords:	QUALITATIVE RESEARCH, PRIMARY CARE, DIABETES & ENDOCRINOLOGY





I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our [licence](#).

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which [Creative Commons](#) licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

BMJ Open

**Original Research**

**Title:** Older Adults' Experiences and Perceived Impacts of the Aging, Community and Health Research Unit – Community Partnership Program (ACHRU-CPP) for Diabetes Self-Management in Canada: A Qualitative Descriptive Study

**Corresponding Author:** Marie-Lee Yous, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, 1280 Main Street West, Room HSC 3N25, Hamilton, Ontario L8S 4K1, Canada, Email: [yousm@mcmaster.ca](mailto:yousm@mcmaster.ca); ORCID: 0000-0002-4271-0401

Marie-Lee Yous, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [yousm@mcmaster.ca](mailto:yousm@mcmaster.ca) ORCID: 0000-0002-4271-0401

Rebecca Ganann, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, email: [ganannrl@mcmaster.ca](mailto:ganannrl@mcmaster.ca) ORCID: 0000-0002-7566-8932

Jenny Ploeg, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [ploegi@mcmaster.ca](mailto:ploegi@mcmaster.ca) ORCID: 0000-0001-8168-8449

Maureen Markle-Reid, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [mreid@mcmaster.ca](mailto:mreid@mcmaster.ca) ORCID: 0000-0002-4019-7077

Melissa Northwood, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [northwm@mcmaster.ca](mailto:northwm@mcmaster.ca) ORCID: 0000-0001-5043-8068

Kathryn Fisher, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada [fisheka@mcmaster.ca](mailto:fisheka@mcmaster.ca) ORCID: 0000-0001-8342-1238

Ruta Valaitis, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [valaitis@mcmaster.ca](mailto:valaitis@mcmaster.ca) ORCID: [0000-0002-3117-0542](https://orcid.org/0000-0002-3117-0542)

Tracey Chambers, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [chambt@mcmaster.ca](mailto:chambt@mcmaster.ca) ORCID: 0000-0002-9325-6894

William Montelpare, Margaret and Wallace McCain Chair in Human Development and Health, Department of Applied Human Sciences, Faculty of Science, University of Prince Edward

## BMJ Open

1  
2  
3 45 Island, Charlottetown, Prince Edward Island, Canada, email: [wmontelpare@upei.ca](mailto:wmontelpare@upei.ca) ORCID:  
4 46 0000-0002-4167-4613  
5  
6

7 48 France Légaré, VITAM-Centre de recherche en santé durable, Université Laval, Québec City,  
8 49 Québec, Canada, email: [France.legare@fmed.ulaval.ca](mailto:France.legare@fmed.ulaval.ca) ORCID: 0000-0002-2296-6696  
9

10 51 Ron Beleno, Patient/Public Research Partner, Aging, Community and Health Research Unit,  
11 52 Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada email:  
12 53 [ron@rb33.com](mailto:ron@rb33.com)  
13

14 54  
15 55 Gary Gaudet, Patient/Public Research Partner, University of Prince Edward Island,  
16 56 Charlottetown, Prince Edward Island, Canada, email: [l.gaudet@bellaliant.net](mailto:l.gaudet@bellaliant.net)  
17 57

18 58 Luisa Giacometti, Patient/Public Research Partner, School of Nursing, Aging, Community and  
19 59 Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
20 60 Canada, email: [luisag@bell.net](mailto:luisag@bell.net)  
21 61

22 62 Deborah Levely, Patient/Public Research Partner, School of Nursing, Aging, Community and  
23 63 Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
24 64 Canada, email: [deborah.levely@rogers.com](mailto:deborah.levely@rogers.com)  
25 65

26 66  
27 66 Craig Lindsay, Patient/Public Research Partner, School of Nursing, Aging, Community and  
28 67 Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
29 68 Canada, email: [lindsay.cr@gmail.com](mailto:lindsay.cr@gmail.com)  
30 69

31 70  
32 70 Allan Morrison, Patient/Public Research Partner, University of Prince Edward Island,  
33 71 Charlottetown, Prince Edward Island, Canada, email: [allan.morrison62.am@gmail.com](mailto:allan.morrison62.am@gmail.com)  
34 72

35 73 Frank Tang, Patient/Public Research Partner, School of Nursing, Aging, Community and Health  
36 74 Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada,  
37 75 email: [frankmtang@gmail.com](mailto:frankmtang@gmail.com)  
38 76

39 76  
40 77 **On behalf of the ACHRU-CPP Research Team**  
41 78

42 79 **Word count** excluding title page, abstract, references, figures and tables (**max 4,000**): 4,672  
43 80  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57



## BMJ Open

1  
2  
3 81 **Abstract (max 300 words):** 300 words  
4

5 82 **Objectives:** To assess the experiences and perceived impacts of the Aging, Community and  
6  
7  
8 83 Health Research Unit – Community Partnership Program (ACHRU-CPP) from the perspectives  
9  
10 84 of older adults with diabetes and other chronic conditions. The ACHRU-CPP is a complex 6-  
11  
12 85 month self-management evidence-based intervention for community-living older adults aged 65  
13  
14 86 years or older with Type 1 or Type 2 diabetes and at least one other chronic condition. It includes  
15  
16 87 home and phone visits, care coordination, system navigation support, caregiver support, and  
17  
18 88 group wellness sessions delivered by a nurse, dietitian or nutritionist, and community program  
19  
20 89 coordinator.  
21  
22

23  
24 90 **Design:** Qualitative descriptive design embedded within a randomized controlled trial was used.  
25

26 91 **Setting:** Six trial sites offering primary care services from three Canadian provinces (i.e.,  
27  
28 92 Ontario, Quebec, and Prince Edward Island) were included.  
29

30  
31 93 **Participants:** The sample was 45 community-living older adults aged 65 years or older with  
32  
33 94 diabetes and at least one other chronic condition.  
34

35 95 **Methods:** Participants completed semi-structured post-intervention interviews by phone in  
36  
37 96 English or French. The analytical process followed Braun and Clarke's experiential thematic  
38  
39 97 analysis framework. Patient partners informed study design and interpretation.  
40  
41

42 98 **Results:** The mean age of older adults was 71.7 years, and the mean length of time living with  
43  
44 99 diabetes was 18.8 years. Older adults reported positive experiences with the ACHRU-CPP that  
45  
46 100 supported diabetes self-management such as, improved knowledge in managing diabetes and  
47  
48 101 other chronic conditions, enhanced physical activity and function, improved eating habits, and  
49  
50 102 opportunities for socialization. They reported being connected to community resources by the  
51  
52 103 intervention team to address social determinants of health and support self-management.  
53  
54  
55  
56  
57

BMJ Open

1  
2  
3 104 **Conclusions:** Older adults perceived that a 6-month person-centred intervention collaboratively  
4  
5 105 delivered by a team of health and social care providers helped support chronic disease self-  
6  
7 106 management. There is a need for providers to help older adults connect with available health and  
8  
9 107 social services in the community.  
10  
11  
12 108

### 13 14 109 **Strengths and limitations of this study**

- 15  
16  
17 110 • This study included a rigorous qualitative design with a large sample size.
- 18  
19 111 • A rigorous analytic method was used involving multiple researchers with expertise in  
20  
21 112 primary care, qualitative, ageing, and diabetes research, as well as programme evaluation.
- 22  
23 113 • Patient and public research partners were involved in designing the intervention,  
24  
25 114 informing the study design and interview guides, interpreting the results, and developing  
26  
27 115 the manuscript.
- 28  
29 116 • A limitation of the study was related to the sample as there was a lack of cultural  
30  
31 117 diversity with regards to ethnicity and under-representation of older adults from  
32  
33 118 marginalized communities.  
34  
35  
36  
37  
38  
39

40 120 **Keywords:** diabetes self-management, older adults, community, primary care, qualitative  
41  
42 121  
43  
44 122  
45  
46 123  
47  
48 124  
49  
50 125  
51  
52 126  
53  
54  
55  
56  
57

## 127 Introduction

128 As of 2022, approximately 422 million people have been diagnosed with diabetes  
129 mellitus worldwide [1]. Older adults are more likely to have Type 2 diabetes than younger adults  
130 [2] and are at risk for hypoglycemia which can adversely affect cognition, vision, hearing,  
131 mobility, and mental health [3] as well as self-care activities including exercise and diet. More  
132 than 40% of older adults with diabetes have three or more chronic conditions [4], including  
133 hyperlipidemia, hypertension, asthma, chronic obstructive pulmonary disease, chronic kidney  
134 disease, arthritis, and heart failure [5]. Following management plans for one condition may be  
135 challenging due to symptoms or conflicting guidelines from another condition. Higher burden  
136 associated with the presence of multiple chronic conditions (MCC) has been linked to higher risk  
137 for mortality, decreased physical and mental functioning, and increased health services use [2, 6,  
138 7]. Community-dwelling older adults with MCC are highly reliant on family/friend caregivers  
139 for support [8], which can lead to poor mental and physical health, and financial losses among  
140 caregivers [9]. Caregivers' unmet needs [10] can lead to their increased use of hospital and  
141 emergency services.

142 Complex health interventions are defined as having multiple interacting components [11].  
143 For older adults with diabetes, complex health interventions such as peer support programs, have  
144 demonstrated positive effects in managing their complex needs, sustaining lifestyle changes, and  
145 achieving health benefits [12-17]. Complex interventions that target self-care and incorporate  
146 opportunities for peer-to-peer discussions among community-dwelling older adults can improve  
147 their mental and physical health and reduce falls [18, 19]. Nurse-led self-management programs  
148 for diabetes and other chronic conditions can lead to improvements in self-rated health, glycated  
149 hemoglobin (HbA1c) values, blood pressure, weight, and self-management behaviours [19, 20].

## BMJ Open

1  
2  
3 150 Providing diabetes self-management programs through partnerships between primary care and  
4  
5 151 community organizations (e.g., senior centres, YMCA) supports program uptake,  
6  
7 152 implementation, and sustainability [12], which can lead to improved health literacy (i.e., being  
8  
9 153 able to locate, read and understand health information for informed decision-making). In a  
10  
11 154 systematic review of randomized controlled trials (RCTs), health literacy was instrumental in  
12  
13 155 enhancing diabetes knowledge, self-efficacy, and physical activity [21].  
14

15  
16  
17 156 Receiving care from multiple providers from different health and community providers  
18  
19 157 can lead to fragmented care for older adults, as referrals across organizations are often not well  
20  
21 158 integrated [22]. Seamless care coordination and system navigation for older adults with MCC  
22  
23 159 remain high priorities for this population. There is a need for innovative programs for older  
24  
25 160 adults that focus on the Quintuple Aims of high-quality care: (a) enhancing the patient  
26  
27 161 experience of care; (b) creating healthy populations; (c) reducing healthcare costs; (d) improving  
28  
29 162 the care delivery experience; and (e) health equity [23]. Gaps in previous intervention designs  
30  
31 163 include lack of emphasis on patient experience of care and considerations for health equity [23].  
32  
33

34  
35 164 The Aging, Community and Health Research Unit – Community Partnership Program  
36  
37 165 (ACHRU-CPP) is a 6-month self-management intervention for community-living older adults ( $\geq$   
38  
39 166 65 years old), diagnosed with Type 1 or Type 2 diabetes and at least one other chronic condition,  
40  
41 167 and their family/friend caregivers ( $\geq$  18 years old). The intervention was evaluated in a  
42  
43 168 feasibility study in Ontario, Canada [24], followed by a clinical trial in selected primary care and  
44  
45 169 community settings in two Canadian provinces (Ontario and Alberta) [25-27]. A multi-  
46  
47 170 jurisdictional pragmatic RCT is currently in progress to evaluate the implementation and  
48  
49 171 effectiveness of the ACHRU-CPP in three Canadian provinces. To better understand how to  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## BMJ Open

172 address the complex needs of older adults, we sought to assess the experiences and perceived  
 173 impacts of the ACHRUCPP from the perspectives of older adults with diabetes and MCC.

174

175

**Methods****Design**

177 This qualitative study is embedded within the multi-site implementation-effectiveness  
 178 type II hybrid RCT, as outlined in the protocol paper [28]. This study used a qualitative  
 179 descriptive design, as described by Sandelowski [29, 30], to provide a fulsome summary while  
 180 remaining close to the words of participants when describing their experiences with the  
 181 ACHRUCPP and its perceived impacts.

**ACHRUCPP Program**

183 The ACHRUCPP is delivered by an interprofessional team of primary care providers,  
 184 which includes a Registered Nurse (RN) and Registered Dietitian (RD) or Nutritionist from a  
 185 primary care setting, and a Program Coordinator (e.g., Registered Kinesiologist) from a local  
 186 community partner organization (hereafter referred to as the intervention team). Table 1  
 187 summarizes the core components of the ACHRUCPP. Due to the COVID-19 pandemic some  
 188 participants received virtual visits by phone or videoconferencing. A comparison of results from  
 189 the virtual and in-person approaches will be published in a future paper.

190

**Table 1.** The ACHRUCPP five core components

<b>Intervention Components</b>	<b>Goals</b>
1. Home/virtual visits (up to 3 home visits) and unlimited follow-up phone calls by a RN and/or RD or Nutritionist	To assess older adults' and caregivers' needs and goals using standardized tools to support a coordinated care plan
2. Monthly group wellness sessions (up to 6 sessions) at a local community centre led by	To provide older adults and caregivers with gentle progressive physical activity, self-

## BMJ Open

Intervention Components	Goals
the RN, RD or Nutritionist and Community Program Coordinator	management education for diabetes and other chronic conditions, and healthy lunches and snacks
3. Monthly team case conferences which include a RN, RD or Nutritionist, and Community Program Coordinator	To discuss the health and social care needs of older adults and caregivers, develop and revise the coordinated care plan, and plan topics for group wellness sessions
4. Collaboration with the primary care interprofessional team and other specialists (e.g., family physicians, nurse practitioners, kinesiologists, social workers, home care and social service providers, pharmacists, endocrinologists)	To support primary care and community providers in working collaboratively to develop care plans for older adults, and connect older adults and caregivers to specialists and community resources
5. Nurse-led care coordination/system navigation	To facilitate linkages to other primary healthcare providers, specialists and community care services for older adults and caregivers

192 *Note.* RN = Registered Nurse; RD = Registered Dietitian

193

## 194 Patient and Public Involvement

195 The need for the program was originally identified by community-dwelling older adults  
 196 with diabetes and other chronic conditions and their caregivers and was subsequently co-  
 197 designed by older adults in collaboration with primary and community care providers and  
 198 researchers [24]. In the current RCT, patient partners from the pan-Canadian Steering Committee  
 199 were involved in reviewing research questions and advising the research team on the selection of  
 200 outcome measures [28]. Patient and public research partners also participated in local  
 201 Community Advisory Boards in each site to inform further adaptations to the intervention and  
 202 support local implementation. Patient and public research partners from the local community  
 203 advisory boards (RB, GG, LG, CL, DL, AM) and the Steering Committee (LM, FT) also  
 204 provided input into development of this manuscript by reviewing and interpreting the results and  
 205 helping to shape the key messages.

BMJ Open

**206 Setting**

207 The study was conducted in two sites in Ontario, Quebec, and Prince Edward Island,  
208 Canada. Each of the six sites was selected to ensure variability in geographic setting (urban and  
209 rural); socio-demographic and cultural backgrounds; language spoken (English or French);  
210 demonstrated support for the ACHRUCPP; and the presence of staff to support intervention  
211 implementation. An RN and RD or Nutritionist from a primary care setting or diabetes education  
212 program worked in partnership with a program coordinator from a local community partner site  
213 (e.g., YMCA) to implement the program.

**214 Sample and Recruitment**

215 Older adults were screened for eligibility to participate in the RCT by a trained staff  
216 member of the primary care site, as described in the study protocol [28]. Eligible patients met the  
217 following inclusion criteria: (a) aged 65 years or older; (b) diagnosis of Type 1 or Type 2  
218 diabetes with at least one other chronic condition; (c) receiving primary care services from one  
219 of the participating primary care settings; (d) living within the area served by the primary care  
220 setting and community site; (e) able to provide informed consent or has a substitute decision-  
221 maker able to provide informed consent on the patient's behalf; and (f) competent in English or  
222 French, or has an interpreter competent in English or French.

223 Following the completion of baseline interviews, patients were randomized to receive the  
224 intervention (i.e., ACHRUCPP) in addition to usual care or usual care alone. A total of 8-10  
225 older adults per site who completed the 6-month intervention were invited to participate in  
226 follow-up telephone interviews. Trained research assistants (MY, RC), with no prior relationship  
227 with participants, used a telephone script to call selected older adults within two weeks of  
228 completing the ACHRUCPP, to invite them to participate in a telephone interview. Maximum

## BMJ Open

229 variation purposive sampling [31] was used to select a diverse sample of participants across all 6  
 230 sites based on their sex, annual income, ethnicity, and level of participation in all components of  
 231 the study.

### 232 Data Collection

233 Semi-structured post-intervention telephone interviews were conducted between April  
 234 2020 and August 2021. Trained research assistants conducted audio-recorded interviews, ranging  
 235 from 20 to 60 minutes in length, in English or French. Interviews were transcribed verbatim by  
 236 experienced transcriptionists. Interviews conducted in English were transcribed and cleaned by  
 237 trained research staff, while interviews conducted in French were transcribed and translated into  
 238 English by professional transcriptionists and later validated by a bilingual member of the  
 239 research team. Transcripts were not returned to participants for their review. The interview guide  
 240 was created based on: (a) a review of the literature of health and social needs of older adults and  
 241 caregivers, patient-provider communication, and system navigation and (b) feedback from  
 242 patient partners and the research team with expertise in aging, community-based supports for  
 243 older adults and caregivers, and qualitative research. Table 2 provides sample interview  
 244 questions.

246 **Table 2.** Sample interview questions for older adults

<b>Questions for Older Adults</b>
1. What did you need the most in the past six months (e.g., physical, emotional, mental or psychological support, transportation, financial assistance, housekeeping, personal care support)?
2. When [name of nurse and dietitian] visited you what types of things did they do during those visits?



## BMJ Open

3. For other people who are living with diabetes and other chronic conditions, would you recommend that a nurse or dietitian, such as [name of nurse and dietitian], visit the person at home, make phone calls or both?

4. What types of things did you do at the monthly wellness sessions or during the individual calls with [name of the community program coordinator]?

5. How, if at all, did [name of nurse and dietitian] involve you in decisions about your care?

6. How, if at all, did [name of nurse and dietitian] help you to connect with other community health or social services to help you?

7. To what extent did the nurse and dietitian help to address your needs or the issues that were most important to you?

8. How happy are you with the overall care that you received from [name of nurse and dietitian]?

9. Was the information given by [name of nurse and dietitian] and other health professionals about care consistent (across individuals)?

10. Is there anything else about your experiences with [name of nurse and dietitian] that you would like to add that we haven't already discussed?

247

248 **Data Analysis**

249 Themes were generated using the Braun and Clarke's experiential thematic analysis  
 250 framework [32] and organized under relevant constructs of the Consolidated Framework for  
 251 Implementation Research framework. [33]. Thematic analysis was selected to ensure that the  
 252 development of themes was informed by the experiences and perceived intervention benefits of  
 253 older adults. The six phases of thematic analysis include: (a) becoming familiar with the data; (b)  
 254 coding; (c) developing themes; (d) reviewing themes; (e) constructing a definition for themes  
 255 and labelling them; and (f) creating a report [32]. A female research assistant with doctoral level  
 256 training in qualitative research (MY) used the data management software NVivo version 12 [34]  
 257 to perform coding. MY is fluent in both languages and coded in English. Results were shared

## BMJ Open

258 with the team in English only. Following the creation of codes, these were further examined for  
259 patterns to generate themes. Themes were shared with the research team, including patient  
260 partners, to ensure they were reflective of the data.

**261 Rigour and Trustworthiness**

262 Consensus was reached by all authors prior to the inclusion of themes in the final report.  
263 Lincoln and Guba's validation criteria [35] were applied in this study to enhance the study's  
264 rigour. To support the credibility of findings, investigator triangulation was used in data analysis  
265 through team meetings with 5-7 members to review the coding structure and evidence of themes.  
266 These members included patient and public research partners and researchers of various  
267 disciplines with expertise in qualitative research, gerontology, and community-based  
268 interventions. Conflicts were resolved through team consensus. To facilitate transferability of  
269 findings, the study sample and setting were described in detail. To support dependability and  
270 confirmability of findings, the research team kept an audit trail of study processes.

271

**272 Results**

273 A total of 295 older adults were enrolled in the RCT and randomly allocated to receive  
274 the ACHRU-CPP or usual care. At the time of data collection, 53 older adults who had  
275 completed the 6-month intervention were approached to participate in the qualitative interviews  
276 and 45 accepted (84.9%). The rate of acceptance by site was as follows: Site 1, 100% (10/10);  
277 Site 2, 89.9% (8/9); Site 3, 89.9% (8/9); Site 4, 60% (6/10); Site 5, 100% (8/8); and Site 6,  
278 71.4% (5/7). Out of the 45 participants, there was good uptake of home visits with a mean of 3.1  
279 (SD (standard deviation) = 1.5) and group wellness sessions with a mean of 2.7 (SD = 1.9).  
280 Where the providers deemed clinically necessary participants received more than the allotted 3

## BMJ Open

281 home visits. Competing commitments such as doctor appointments and lack of interest were  
 282 barriers to attending group wellness sessions for some participants.

### 283 *Demographic Characteristics*

284 The mean age of the 45 older adults who participated in interviews was 71.1 years and  
 285 the mean length of time living with diabetes was 18.8 years (SD = 10.6). Most were female  
 286 (55.6%), retired from paid work (80%), had Type 2 diabetes (93.3%), and reported 4-6 chronic  
 287 conditions (44.4%). Hypertension, hyperlipidemia, and osteoarthritis and other arthritis (e.g.,  
 288 rheumatoid arthritis) were the most reported chronic conditions. Table 3 summarizes  
 289 demographic characteristics of participants.

291 **Table 3.** Demographic characteristics of interview participants

Older Adults (n=45)	
Category	n (%)
Age (mean [Standard Deviation]): 71.7 [6.5]	
65-70	26 (57.8)
71-75	7 (15.6)
76+	12 (26.7)
Sex	
Female	25 (55.6)
Male	20 (44.4)
Marital Status	
Married or living with a partner	21 (46.7)
Divorced, never married, separated, or widowed	23 (51.1)
Refused	1 (2.2)
Highest Level of Education	
Completed a graduate or professional degree	6 (13.3)
Completed a bachelor's degree	10 (22.2)
Had some university education or completed a community college, technical college, or postsecondary program	12 (26.7)
Completed secondary school	10 (22.2)
Did not complete secondary school	7 (15.6)
Current Employment Status	
Retired from paid work	36 (80.0)

BMJ Open

<b>Older Adults (n=45)</b>	
<b>Category</b>	<b>n (%)</b>
Employed full-time	4 (8.9)
Employed part-time	2 (4.4)
Unemployed and looking for work	1 (2.2)
Refused	2 (4.4)
<b>Annual Household Income</b>	
\$150,000 or more	2 (4.4)
\$100,000 or more, but less than \$150,000	2 (4.4)
\$50,000 or more, but less than \$100,000	12 (26.7)
\$20,000 or more, but less than \$50,000	16 (35.6)
Less than \$20,000	11 (24.4)
Refused	2 (4.4)
<b>Born in Canada</b>	
Yes	31 (68.9)
<b>Ethnic/Racial Group</b>	
White/Caucasian	32 (71.1)
Black	3 (6.7)
Caribbean/Guyanese	3 (6.7)
Filipino	2 (4.4)
First Nations	1 (2.2)
South Asian	1 (2.2)
Southeast Asian	1 (2.2)
Chinese	1 (2.2)
Japanese	1 (2.2)
<b>Language(s) Spoken</b>	
English	37 (82.2)
French	15 (33.3)
<b>Living with Others (e.g., spouse, children, other relative, friend, group setting)</b>	
Yes	27 (60.0)
<b>Type of Diabetes</b>	
Type 1 diabetes	1 (2.2)
Type 2 diabetes	42 (93.3)
Unknown	2 (4.4)
<b>Number of Chronic Conditions (mean [Standard Deviation]): 5.6 [2.9]</b>	
1-3	11 (24.4)
4-6	20 (44.4)
7-9	8 (17.8)
10 +	6 (13.3)
<b>Commonly Reported Chronic Conditions</b>	
Hypertension	34 (75.6)
Hyperlipidemia	27 (60.0)
Osteoarthritis and other arthritis	18 (40.0)
Cardiovascular disease	16 (35.6)
<b>At Least 1 Emergency Room Visit in the Last 6 Months</b>	

## BMJ Open

Older Adults (n=45)	
Category	n (%)
6 months prior to ACHRUCPP	8 (17.8)
6-month follow-up	7 (15.6)

292

293 **Themes**

294 Themes were grouped into two categories, experiences, and perceived impacts of the  
 295 ACHRUCPP. Table 4 provides an overview of themes. The words in italics that label the theme  
 296 are taken verbatim from transcripts. Similarly, participant quotes in the narrative that follows are  
 297 noted in italics and identified by OA for older adult, # for site number, and ### for participant  
 298 number.

299

300 **Table 4.** Themes of older adult experiences and perceived impacts with the ACHRUCPP

301

Experiences with the ACHRUCPP
<ul style="list-style-type: none"> <li>• In-depth dialogue with “<i>professional friends</i>”</li> <li>• Socialized with “<i>people with the same type of health problems</i>”</li> <li>• Person-centred care by “<i>more than one knowledgeable person</i>”</li> <li>• Ongoing contact with providers so “<i>you are not alone</i>”</li> <li>• Need to address ethnic/cultural differences through a “<i>personal session</i>”</li> </ul>
Perceived Impacts of the ACHRUCPP
<ul style="list-style-type: none"> <li>• Improved diabetes self-management behaviours: “<i>make more proactive steps</i>”</li> <li>• Added connection to health and social support services “<i>that could help me</i>”</li> </ul>

302

303

304

BMJ Open

305 ***Experiences with the ACHRUCPP***

306 Overall, older adults reported positive experiences with the ACHRUCPP. They  
307 experienced: (a) in-depth dialogue with “*professional friends*”; (b) socialized with “*people with*  
308 *the same type of health problems*”; (c) person-centred care by “*more than one knowledgeable*  
309 *person*”; (d) ongoing contact with providers so “*you are not alone*”; and identified the (e) need  
310 to address ethnic/cultural differences: “*eating has to do with seasons*”.

311 **In-depth dialogue with “*professional friends*”.** In-person home and virtual visits were  
312 perceived by older adults as more relaxed compared to clinic visits and provided opportunities  
313 for in-depth dialogue about health and social issues with providers. “*The home visits are more*  
314 *relaxed, if you were at a clinic, you got a time slot you got to meet whatever is transacted in that*  
315 *timeframe*” (OA\_1\_152). Findings revealed that older adults had a lot of concerns and questions  
316 regarding diabetes and other chronic conditions that were often left unanswered by providers due  
317 to the nature of clinic visits that are limited by time and ailment. Home visits helped to build  
318 trust between older adults and the providers, which facilitated the exploration of concerns and  
319 needs beyond diabetes such as safe housing and transportation issues. “*I felt I could trust her*  
320 *[nutritionist]*” (OA\_5\_037). Providers were approachable and understanding of older adults’  
321 situations and were considered as friends and confidants. “*They [providers] were professional*  
322 *friends*” (OA\_2\_242). Their approach was especially important when discussing sensitive topics  
323 such as mental health concerns. “*I had my sick niece calling me and that was stressing me, so she*  
324 *[nurse] said to “Let go. When we are stressed, that’s not always good”. So how to manage my*  
325 *stress*” (OA\_6\_023).

326 **Socialized with “*people with the same type of health problems*”.** Older adults and  
327 caregivers perceived that group wellness sessions helped them meet others who understood what

## BMJ Open

328 it is like to live with diabetes and other chronic conditions. *“The fact of socializing with other*  
329 *people with the same types of health problems as we do”* (OA\_5\_037). Learning about the  
330 burden that others experience with their conditions encouraged older adults to support each other  
331 and express their frustrations. The sessions provided opportunities for group exercises which  
332 provided peer motivation. The group sessions were particularly helpful for older adults who were  
333 socially isolated, and some older adults became friends because of the sessions.

334 **Person-centred care by “more than one knowledgeable person”.** Older adults  
335 appreciated that they received person-centred care from a team of providers through the  
336 ACHRU-CPP to discuss diabetes, their other chronic conditions, and social concerns. Some  
337 older adults perceived that in usual care providers at times delivered care in silos or independent  
338 of other disciplines. Older adults valued providers working collaboratively to meet their needs.  
339 *“It was good that they worked in a team. More than one knowledgeable person. That was*  
340 *important”* (OA\_2\_242). They felt that providers were listening to their concerns and that, prior  
341 to meeting with the intervention team, it was difficult to find the right person to talk to about  
342 diabetes.

343 *I enjoyed having them come to visit. I don't talk to a lot of people about my diabetes because*  
344 *I don't feel it's that complicated, but nobody really wants to listen about your health issues.*  
345 (OA\_3\_032)

347 Providers supported the management of other conditions in addition to diabetes. *“I was having*  
348 *troubles with my bowels, but we got that regulated and it's good”* (OA\_4\_075).

349 **Ongoing contact with providers so “you are not alone”.** Providers made older adults  
350 feel that someone was concerned about their well-being. *“It's not as if we are just left alone with*  
351 *our problems. What you are doing is very good; continue”* (OA\_5\_128). Managing diabetes and  
352 older adults felt burdensome for older adults and they appreciated regular contact with providers.

## BMJ Open

1  
2  
3 353 Follow-up phone calls were well received by older adults, especially by those living alone or  
4  
5 354 with little support, and ensured that they “*haven’t fallen through the cracks*” (OA\_3\_058). The  
6  
7  
8 355 ongoing follow-up with the team reinforced familiar information that older adults had forgotten  
9  
10 356 to put into practice over time. A few participants reported that once the intervention stopped at  
11  
12 357 the 6-month period they felt that there was a break in the social connection with peers and formal  
13  
14  
15 358 providers.

16  
17 359 **Need to address ethnic/cultural differences through a “*personal session*”.** Some  
18  
19 360 ethnic groups may have language barriers and be “*very shy and they don’t approach people*  
20  
21 361 *unless someone else pushes them to go [join programs]*” (OA\_1\_061). Some older adults  
22  
23 362 perceived that individual wellness sessions with providers may be helpful for those with  
24  
25 363 language barriers. “*Some of them had a bit of a language problem. I think a personal session*  
26  
27 364 *would be much more helpful*” (OA\_2\_086). There is a need to allow dedicated time for older  
28  
29 365 adults to share their cultural practices during interactions with peers and the intervention team.  
30  
31  
32

33 366 *One of the things I learned about myself from my community [Indigenous community] and*  
34 367 *my family is that eating has to do with seasons...Your year-round diet has to do with what’s*  
35 368 *available to you...I mentioned that one time in the group [Group Wellness Sessions]and they*  
36 369 *thought that had nothing to do with what the topics were.* (OA\_2\_013)  
37  
38 370

**371 Perceived Impacts**

39  
40  
41 372 Older adults perceived that the ACHRU-CPP had positive impacts on their health and  
42  
43 373 well-being as a result of: (a) improved diabetes self-management behaviours: “*make more*  
44  
45 374 *proactive steps*” and (b) added connection to health and social support services “*that could help*  
46  
47 375 *me*”.

48  
49  
50 376 **Improved diabetes self-management behaviours: “*make more proactive steps*”.** Older  
51  
52 377 adults felt that the ACHRU-CPP helped them to take more action in preventing hypoglycemia  
53  
54 378 and hyperglycemia and decreasing their blood pressure. They recognized that reaching a level of  
55  
56  
57



## BMJ Open

379 effective self-management of chronic conditions can be complicated and they appreciated the  
380 support provided through the ACHRUCPP. They reported that providers helped them to be alert  
381 to complications that can arise from poor diabetes care.

382 *What [the nurse] and [dietitian] caused me to be concerned about is to make more proactive*  
383 *steps, to watch out for those low blood sugars. I really didn't realize how badly they could*  
384 *affect you. Shaking and double vision is one thing but not being able to drive, that's quite*  
385 *another thing. (OA\_2\_242)*

387 Older adults indicated that they gained nutritional knowledge by participating in the  
388 ACHRUCPP. *"I improved it [eating habits]. I had to eat more fruit and vegetables...and after*  
389 *that, I had to hydrate myself more and add more fibre to my diet"* (OA\_5\_027). Older adults  
390 perceived that changes made to their diet could lead to multiple benefits including weight loss  
391 and decreased sugar levels. *"...drinking more water and diet, I think that's what was important,*  
392 *and I lost weight at the same time. By eating well, fewer treats, being more careful, the sugar*  
393 *levels were lower"* (OA\_6\_005).

394 Older adults perceived they were able to build more muscle mass and lose weight and  
395 experienced less difficulty in climbing stairs. Some older adults felt that they were not exercising  
396 enough prior to participating in the ACHRUCPP and perceived that the providers helped them  
397 to meet their activity goals.

398 *They really helped me with the exercise piece. I had poor balance. It was the [nurse and*  
399 *dietitian] that really said 'why don't you try doing this? I'll give you a call this week and see*  
400 *if you got out to do your walk', and then I'd promise them that I would start journaling my*  
401 *steps so little by little I started increasing my exercise. (OA\_2\_247)*

403 **Added connection to health and social support services "that could help me".** Older  
404 adults indicated that they were referred to and connected with health and social support services  
405 (e.g., food bank, exercise program, smoking cessation, home care, social work, arts program).  
406 Living well with diabetes and other chronic conditions were perceived by older adults as

## BMJ Open

1  
2  
3 407 requiring more than just medical care. Some older adults required supports to meet their basic  
4  
5 408 needs, as they were not able to afford groceries or travel far distances for groceries and  
6  
7 409 medications. “*She [nurse] referred me [for medication delivery]*” (OA\_1\_061). Some older  
8  
9 410 adults required mental health support to enhance their ability to manage diabetes and other  
10  
11 411 chronic conditions. The intervention team followed-up with older adults after making referrals to  
12  
13 412 ensure that they were connected. Older adults were referred to local community resources that  
14  
15 413 offered free or low-cost services. “*They told me I could go to [name of community centre] to do*  
16  
17 414 *exercise*” (OA\_4\_016). Prior to participating in the ACHRUCPP older adults indicated that they  
18  
19 415 had seldom been referred to programs outside of the clinic and therefore they were not aware of  
20  
21 416 available community resources.

22  
23  
24  
25  
26 417 Older adults found it important to be aware of publicly-funded resources, such as tax  
27  
28 418 rebates and housing options, in case they or their loved one required these in the future. By  
29  
30 419 attending group wellness sessions, they learned about the types of programs the community  
31  
32 420 partner sites had to offer. “*They [community partner site] have virtual classes and they’re all*  
33  
34 421 *free. They have special classes just for seniors*” (OA\_2\_013). Despite the mostly positive  
35  
36 422 impacts of being connected with relevant health and social services, some participants reported  
37  
38 423 that not all of their needs were met at the group wellness sessions. For example, some did not  
39  
40 424 qualify for certain financial assistance programs. “*They just said you have to qualify [for*  
41  
42 425 *financial assistance] because...you have to apply for this, you have to apply for this*”  
43  
44 426 (OA\_1\_058). Some participants reported that it was difficult to absorb all of the information  
45  
46 427 presented and not all of the information was relevant to their situation. It was challenging to  
47  
48 428 tailor group wellness sessions to individual needs compared to home visits which allowed further  
49  
50 429 individualized tailoring.  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

BMJ Open

430

431

**Discussion**

432 Key findings of this study were that the ACHRUCPP increased in-depth dialogue with  
433 *'professional friends'* and provided person-centred care and ongoing contact with providers to  
434 prevent feelings of being alone. Group interactions brought together participants with the same  
435 type of health issues and provided peer motivation. Participants identified that the program  
436 would benefit from adaptations to address cultural and language differences among older adults  
437 living with diabetes and other conditions in Canada.

438 Older adults with multimorbidity and diabetes face significant burden in managing their  
439 chronic conditions, which challenge their self-care and adversely affect their overall quality of  
440 life [36]. In addition to managing diabetes symptoms and complications (e.g., hypoglycemia and  
441 hyperglycemia, visual impairment, neuropathy) which negatively impact their physical  
442 functioning, older adults with diabetes often experience psychological burden associated with  
443 complex medication and diet regimens (e.g., medication and insulin management and glycemic  
444 control) [36]. Added pressures include financial burden, food insecurity, social isolation, lack of  
445 social support, as well as frailty, and the burden of comorbid chronic conditions, e.g., anxiety,  
446 depression [36]. Several of these challenges were experienced by our study participants. The  
447 largely positive response to the program could be attributed to the support that participants  
448 received in managing the burden associated with living with diabetes and other chronic  
449 conditions. High quality care for this population to prevent diabetes distress (i.e., challenges  
450 faced when dealing with the demands of diabetes), requires good communication and trusting  
451 relationships with providers, social and peer support, and self-management education [37]. A  
452 novel finding of this study was that the ACHRUCPP was perceived by older adults from three

## BMJ Open

1  
2  
3 453 Canadian provinces to positively impact their self-management practices of diabetes and MCC  
4  
5 454 by helping to address their broad health and social needs. This has not been documented before  
6  
7 455 in similar studies [19, 20]. This may be because the ACHRUCPP was longer and more person-  
8  
9 456 centred compared to other interventions. Interventionists were able to directly assess the home  
10  
11 457 context and understand the impacts of social determinants of health. Mental health concerns and  
12  
13 458 lack of support can impact the ability of older adults to effectively manage diabetes and lead to  
14  
15 459 severe hypoglycemia, elevated HbA1c levels, a greater number of missed insulin doses, and a  
16  
17 460 higher risk for diabetic ketoacidosis and mortality [38, 39, 3].

21 461 When healthcare providers recommend lifestyle changes, they need to recognize that  
22  
23 462 social determinants of health such as housing, food security, social relationships, and financial  
24  
25 463 stability have an impact on older adults' abilities to enact them [40]. In the current study, the  
26  
27 464 intervention team assessed the social determinants of health and found ways to address them,  
28  
29 465 such as by linking older adults with relevant community resources, to help overcome barriers to  
30  
31 466 self-management. The intervention team targeted health literacy of older adults and caregivers  
32  
33 467 through education, capacity building, and opportunities for dialogue among peers and experts.  
34  
35 468 Community-based interventions were found to be most effective for Type 2 diabetes self-  
36  
37 469 management compared to other interventions [21].

42 470 In the current study, older adults appreciated receiving person-centred care supported by  
43  
44 471 a team of providers from primary care and community sectors and the engagement of providers  
45  
46 472 outside of the intervention team (such as social workers). Due to the complex nature of diabetes  
47  
48 473 and MCC, interprofessional collaboration has been found to lead to positive outcomes for  
49  
50 474 persons with Type 2 diabetes, such as improvements in HbA1c levels, regular testing of blood  
51  
52 475 glucose levels, and smoking cessation [41, 42].

## BMJ Open

1  
2  
3 476 What is unique about this study is the partnership between healthcare providers and a  
4  
5 477 Program Coordinator from a local community partner site. These health and social services can  
6  
7 478 be underutilized if healthcare providers are not aware of them. As per the Quintuple Aim [23]  
8  
9  
10 479 there is a need to optimize the use of existing community-based services for patients, address any  
11  
12 480 barriers to accessing these services, and for strong coordination of services [43].  
13

14  
15 481 Person-centred care was perceived to be key strength of the ACHRU-CPP that enabled  
16  
17 482 older adults to improve self-management practices related to diabetes and MCC. In working  
18  
19 483 towards a person-centred learning health system, defined as a health system that integrates  
20  
21 484 internal data, patient experience, and research evidence [44], the priorities and experiences of  
22  
23 485 older adults should be regularly reported in data systems so that services that meet their needs are  
24  
25 486 developed and evaluated as part of continuous quality improvement processes [38]. As seen in  
26  
27 487 this study, patient experience can be improved by having a provider connect patients with other  
28  
29 488 interdisciplinary health and social care providers to ensure that smooth transitions between  
30  
31 489 services occur [45].  
32

33  
34  
35 490 In practice and policy, there is a need for integrated care delivery models that leverage  
36  
37 491 community partnerships to help fill gaps in meeting the complex health and social needs of older  
38  
39 492 adults with diabetes. To advance Quintuple Aim outcomes [23], it is critical to assess patient  
40  
41 493 experiences with receiving healthcare services as part of intervention research and practice to  
42  
43 494 improve health system performance. The strengths of the study include its rigorous qualitative  
44  
45 495 design and large sample size, and the inclusion of diverse participants with regards to sex,  
46  
47 496 marital status, and annual income from multiple sites across Canada. A limitation of the study  
48  
49 497 was related to the sample as there was a lack of cultural diversity and under-representation of  
50  
51 498 older adults from marginalized communities. A Diabetes Canada roundtable of key stakeholders  
52  
53  
54  
55  
56  
57  
58  
59  
60

BMJ Open

1  
2  
3 499 recently emphasized the need to implement community-based interventions [46], such as the  
4  
5 500 ACHRUCPP, to better support older adults with diabetes and MCC living in marginalized  
6  
7 501 communities. The need for community-based interventions is based on the premise that racial  
8  
9 502 and socioeconomic disparities disproportionately affect them and put them at an increased risk for  
10  
11 503 diabetes complications and mortality [47].  
12  
13  
14  
15 504

### 505 **Conclusion**

19 506 Overall, older adults with diabetes and MCC reported a positive experience and felt that  
20  
21 507 the ACHRUCPP had a positive impact in supporting diabetes self-management. Study findings  
22  
23 508 reveal the need to ensure that older adults receive ongoing support and contact with a  
24  
25 509 collaborative team of primary care and community providers to better meet the complex needs  
26  
27 510 associated with daily self-management of diabetes and MCC. Results also shine light on the  
28  
29 511 broader social context that constitutes the life world of older adults and how chronic disease self-  
30  
31 512 management interventions need to address these contexts comprehensively through tailoring to  
32  
33 513 individual circumstances. It is our hope that these findings will help usher in a new era of  
34  
35 514 contextually informed person-centred care.  
36  
37  
38  
39  
40 515

### 42 516 **Acknowledgements**

44 517 We thank the older adults and caregivers who participated in this study, as well as the  
45  
46 518 nurses, dietitians, nutritionists and community program coordinators who provided the  
47  
48 519 intervention. We also thank the managers of intervention teams, the recruiters, research  
49  
50 520 assistants, and the study sites for their support of this study. Thanks to Robyn Connors for  
51  
52 521 conducting interviews with study participants. We thank the research team in the Aging,  
53  
54  
55  
56  
57

## BMJ Open

1  
2  
3 522 Community and Health Research Unit (<https://achru.mcmaster.ca/>) for supporting this study. We  
4  
5 523 would also like to thank the Community Advisory Board members, including people with lived  
6  
7 524 experience with diabetes, who supported local implementation of the project in each province.  
8  
9

10 525 We acknowledge the following authors who are members of the **ACHRU-CPP**

11  
12 526 **Research Team:** **Jenny Ploeg**, School of Nursing, Faculty of Health Sciences, McMaster  
13  
14 527 University, Hamilton, Ontario, Canada; **Maureen Markle-Reid**, School of Nursing, Faculty of  
15  
16 528 Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Ruta Valaitis**, School of  
17  
18 529 Nursing, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada;  
19  
20 530 **Kathryn Fisher**, School of Nursing, Aging, Community and Health Research Unit, Faculty of  
21  
22 531 Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Rebecca Ganann**, School of  
23  
24 532 Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster  
25  
26 533 University, Hamilton, Ontario, Canada; **Johanne Blais**, Department of Family Medicine and  
27  
28 534 Emergency Medicine, Faculty of Medicine, Université Laval, Quebec City, Quebec; **Andrea**  
29  
30 535 **Gruneir**, Department of Family Medicine Research Program, University of Alberta, Edmonton,  
31  
32 536 Alberta, Canada; **France Légaré**, VITAM-Centre de recherche en santé durable, Université  
33  
34 537 Laval, Quebec City, Quebec, Canada; **Janet MacIntyre**, Faculty of Nursing, University of  
35  
36 538 Prince Edward Island, Charlottetown, Prince Edward Island, Canada; **William Montelpare**,  
37  
38 539 Department of Applied Human Sciences, Faculty of Science, University of Prince Edward  
39  
40 540 Island, Prince Edward Island, Canada; **Jean-Sébastien Paquette**, Department of Family  
41  
42 541 Medicine and Emergency Medicine, Faculty of Medicine Université Laval, Québec, Canada;  
43  
44 542 **Marie-Eve Poitras**, Department of Family Medicine and Emergency Medicine, Faculty of  
45  
46 543 Medicine and Health Sciences, Université de Sherbrooke Chicoutimi, Quebec, Canada; **Angela**  
47  
48 544 **Riveroll**, Department of Applied Human Sciences, Faculty of Science, University of Prince  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## BMJ Open

1  
2  
3 545 Edward Island, Charlottetown, Prince Edward Island, Canada, **Ali Ben Charif**, CubecXpert,  
4  
5 546 Quebec City, Quebec, Canada; **Dean Eurich**, School of Public Health, University of Alberta,  
6  
7 547 Edmonton, Alberta, Canada; **Amiram Gafni**, Department of Health Research Methods,  
8  
9 548 Evidence and Impact, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
10  
11 549 Canada; **Gary Lewis**, Department of Medicine and Department of Physiology, University of  
12  
13 550 Toronto, Toronto, Ontario, Canada; **Lynne Mansell**, Patient/Public Research Partner, Alberta,  
14  
15 551 Canada; **Melissa Northwood**, School of Nursing, Aging, Community and Health Research Unit,  
16  
17 552 Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Janet Pritchard**,  
18  
19 553 Interdisciplinary Science and Kinesiology, Faculty of Science, McMaster University, Hamilton,  
20  
21 554 Ontario, Canada; **Cheryl Sadowski**, Faculty of Pharmacy and Pharmaceutical Sciences,  
22  
23 555 University of Alberta, Edmonton, Alberta, Canada; **Diana Sherifali**, School of Nursing, Faculty  
24  
25 556 of Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Frank Tang**,  
26  
27 557 Patient/Public Research Partner, Ontario, Canada; **Lehana Thabane**, Department of Health  
28  
29 558 Research Methods, Evidence and Impact, Faculty of Health Sciences, McMaster University,  
30  
31 559 Hamilton, Ontario, Canada; **Ross Upshur**, Bridgepoint Active Healthcare, Toronto, Ontario,  
32  
33 560 Canada; **Tyler Williamson**, Centre for Health Informatics, Cumming School of Medicine and  
34  
35 561 Department of Community Health Sciences, University of Calgary, Calgary, Alberta, Canada;  
36  
37 562 **Marie-Lee Yous**, School of Nursing, Faculty of Health Sciences, McMaster University,  
38  
39 563 Hamilton, Ontario, Canada.  
40  
41  
42  
43  
44  
45  
46  
47  
48

**Author Contributions**

49 565  
50  
51 566 Conceptualization: JP, MMR, RV, KF, RG, FL, WM.  
52  
53 567 Formal Analysis: MY, RG, TC, JP.  
54  
55  
56  
57  
58  
59  
60



## BMJ Open

568 Funding Acquisition: JP, MMR, RV, KF, RG, AG, FL, JM, WM.

569 Investigation: JP, MMR, RV, KF, RG, TC, FL, WM, MY.

570 Methodology: JP, MMR, RV, KF, RG, MY, FL, WM.

571 Project Administration: JP, MMR, RV, TC, FL, WM.

572 Resources: JP, MMR, RV, FL, WM.

573 Supervision: JP, MMR, RV, RG, TC, FL, WM.

574 Validation: MY, JP, MMR, RV, KF, RG, TC, RC.

575 Writing – Original Draft: MY.

576 Writing – Review and Editing: MY, RG, TC, JP, MMR, RV, KF, FL, JM, WM. The authors read  
577 and approved the final manuscript.

578

### 579 Funding

580 This study is supported, in part, by funding from the Canadian Institutes of Health  
581 Research Strategy for Patient-Oriented Research (SPOR) Primary and Integrated Health Care  
582 Innovations Network: Programmatic Grants (Funding Reference Number: KPG-156883) in  
583 partnership with: Diabetes Action Canada, a Canadian Institutes for Health Research (CIHR)  
584 Strategy for Patient-Oriented Research Network in Chronic Disease (project reference  
585 #1.1.1ACHR); McMaster Institute for Research on Aging (Hamilton, ON); McMaster University  
586 School of Nursing; Réseau-1 Québec; Fonds de Recherche du Québec (FRQS); Scarborough  
587 Health Network Foundation. This research was also undertaken, in part, thanks to the funding  
588 from Dr. Markle-Reid's Tier 2 CIHR Canada Research Chair. The study was investigator-  
589 initiated. The funders of this study had no role in study design, data collection, data analysis, data  
590 interpretation or writing the manuscript.

BMJ Open

591

592

### Competing Interests

593 None declared.

594

595

### Availability of Data and Materials

596

597

598

599

600

601

### Ethics Statement

602

603

604

605

606

607

608

609

610

611

612

613

The data for this research consists of questionnaires and interviews. Raw data such as audio-files and interview transcripts cannot be publicly released due to the risk of compromising participant confidentiality related to identification of voices and publicly exposing personal information.

Institutional ethics approval was obtained from the following: the Hamilton Integrated Research Ethics Board (#5101); the Scarborough Health Network Research Ethics Board (#NEP-18-014); the Unity Health Toronto Research Ethics Board (#18-336); University of Prince Edward Island Research Ethics Board (#6008019); Prince Edward Island Research Ethics Board (#6008019); and Centre intégré universitaire de santé et de services sociaux (CIUSSS) de la Capitale-Nationale (MP-13-2019-1670). Trained research assistants obtained informed consent from all older adult participants prior to their participation in the study, and all participants received a copy of their consent form, in person or by mail. All participants gave permission to audio-record their interview. All participant information was kept confidential in a secure location (e.g., locked cabinet in a secured office, password-protected encrypted electronic folders), and data were de-identified using unique study IDs. Participants who completed a qualitative interview received a \$25.00 gift card as an honorarium.

614

615

## References

- [1] World Health Organization. Diabetes. Available from: <https://www.who.int/en/news-room/fact-sheets/detail/diabetes>. 2022. Accessed 3 Jan 2022.
- [2] Kirkman MS, Briscoe VJ, Clark N, et al. Diabetes in older adults: A consensus report. *J Am Geriatr Soc* 2012;35(12):2650-64.
- [3] Dhaliwal R, Weinstock RS. Management of type 1 diabetes in older adults. *Diabetes Spectr*. 2014;27(1):9-20.
- [4] Sinnige J, Braspenning J, Schellevis F, et al. The prevalence of disease clusters in older adults with multiple chronic diseases—a systematic literature review. *PloS one* 2013;8(11):e79641.
- [5] Lin PJ, Kent DM, Winn A, et al. Multiple chronic conditions in type 2 diabetes mellitus: prevalence and consequences. *Am J Manag Care* 2015;21(1):e23-34.
- [6] Fisher K, Griffith L, Gruneir A, et al. Comorbidity and its relationship with health service use and cost in community-living older adults with diabetes: A population-based study in Ontario, Canada. *Diabetes Res Clin Pract* 2016;122:113-123.
- [7] Willi C, Bodenmann P, Ghali WA, et al. Active smoking and the risk of type 2 diabetes: A systematic review and meta-analysis. *JAMA* 2007; 298:2654-64.
- [8] Ploeg J, Matthew-Maich N, Fraser K, et al. Managing multiple chronic conditions in the community: A Canadian qualitative study of the experiences of older adults, family caregivers and healthcare providers. *BMC Geriatr* 2017;17.
- [9] The Change Foundation. Family caregiver assessment in health care settings, summary of the change foundation's literature review and environment scan project. Toronto, August 2016.
- [10] McGilton KS, Vellani S, Yeung L, et al. Identifying and understanding the health and social care needs of older adults with multiple chronic conditions and their caregivers: A scoping review. *BMC Geriatr* 2018;18(1):1-33.
- [11] Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ*. 2008;337:1-6.
- [12] Whitemore R. A systematic review of the translational research on the diabetes prevention program. *Transl Behav Med* 2011;1:480-91.
- [13] Tuomilehto J, Schwarz P, Lindström J. Long-term benefits from lifestyle interventions for type 2 diabetes prevention: Time to expand the efforts. *Diabetes Care* 2011;34:S210-14.
- [14] Smith SM, Wallace E, O'Dowd T, et al. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database Syst Rev* 2016;3.
- [15] Yoon U, Kwok LL, Magkidis A. Efficacy of lifestyle interventions in reducing diabetes incidence in patients with impaired glucose tolerance: A systematic review of randomized controlled trials. *Metabolism* 2013;62:303-14.
- [16] Busetto L, Luijkx KG, Elissen AMJ, et al. Context, mechanisms and outcomes of integrated care for diabetes mellitus type 2: A systematic review. *BMC Health Serv Res* 2016;16:1-14.
- [17] Diabetes Prevention Program Research Group. 10-year follow-up of diabetes incidence and weight loss in the diabetes prevention program outcomes study. *Lancet* 2009;374:1677-86.

- 1  
2  
3 656 [18] Wong KC, Wong FKY, Yeung W, et al. The effect of complex interventions on supporting  
4 657 self-care among community-dwelling older adults: A systematic review and meta-analysis. *Age*  
5 658 *Ageing* 2017;1-9.
- 6 659 [19] Azami G, Soh KL, Sazlina SG, et al. Effect of a nurse-led diabetes self-management  
7 660 education program on glycosylated hemoglobin among adults with type 2 diabetes. *J Diabetes*  
8 661 *Res* 2018:1-13.
- 9 662 [20] Chow SK, Wong FK. A randomized controlled trial of a nurse-led case management  
10 663 programme for hospital-discharged older adults with co-morbidities. *J Adv Nurs*  
11 664 2014;70(10):2257-71.
- 12 665 [21] Dahal PK, Hosseinzadeh H. Association of health literacy and diabetes self-management: A  
13 666 systematic review. *Aust J Prim Health* 2020;25(6):526-33.
- 14 667 [22] Ferris R, Blaum C, Kiwak E, et al. Perspectives of patients, clinicians, and health system  
15 668 leaders on changes needed to improve the health care and outcomes of older adults with multiple  
16 669 chronic conditions. *J Aging Health* 2018;30(5):778-99.
- 17 670 [23] Nundy S, Cooper LA, Mate KS. The Quintuple Aim for health care improvement: A new  
18 671 imperative to advance health equity. *JAMA* 2022;327(6):521-522.
- 19 672 [24] Markle-Reid M, Ploeg J, Fisher K, et al. The Aging, Community and Health Research  
20 673 Unit—Community Partnership Program for older adults with type 2 diabetes and multiple  
21 674 chronic conditions: A feasibility study. *Pilot Feasibility Stud* 2016 2(1):24.
- 22 675 [25] Markle-Reid M, Ploeg J, Fraser KD, et al. Community program improves quality of life and  
23 676 self-management in older adults with diabetes mellitus and comorbidity. *J Am Geriatr Soc*. 2018  
24 677 Feb;66(2):263-73.
- 25 678 [26] Miklavcic JJ, Fraser KD, Ploeg J, Markle-Reid M, Fisher K, Gafni A, Griffith LE, Hirst S,  
26 679 Sadowski CA, Thabane L, Triscott JA. Effectiveness of a community program for older adults  
27 680 with type 2 diabetes and multimorbidity: A pragmatic randomized controlled trial. *BMC Geriatr*.  
28 681 2020 Dec;20(1):1-14.
- 29 682 [27] Fisher K, Markle-Reid M, Ploeg J, Bartholomew A, Griffith LE, Gafni A, Thabane L, Yous  
30 683 ML. Self-management program versus usual care for community-dwelling older adults with  
31 684 multimorbidity: A pragmatic randomized controlled trial in Ontario, Canada. *J Comorb*. 2020  
32 685 Oct 14;20(174):1-14.
- 33 686 [28] Ploeg J, Markle-Reid M, Valaitis R, et al. The Aging, Community and Health Research Unit  
34 687 Community Partnership Program for older adults with diabetes and multiple chronic conditions:  
35 688 Study protocol for a randomized controlled trial. *BMC Geriatrics* 2022;22(99):1-22.
- 36 689 [29] Sandelowski M. Whatever happened to qualitative description? *Res Nurs health*.  
37 690 2000;23(4):334-40.
- 38 691 [30] Sandelowski M. What's in a name? Qualitative description revisited. *Res Nurs Health*. 2010  
39 692 Feb;33(1):77-84.
- 40 693 [31] Patton MQ. *Qualitative evaluation and research methods*. Beverly Hills, CA: SAGE, 1990.
- 41 694 [32] Braun V, Clarke V. *Successful qualitative research: A practical guide for beginners*.  
42 695 London, England: SAGE, 2013.
- 43 696 [33] Damschroder LJ, Aron DC, Keith RE, et al. Fostering implementation of health services  
44 697 research findings into practice: A consolidated framework for advancing implementation  
45 698 science. *Implement Sci*. 2009 Dec;4(1):1-5.
- 46 699 [34] QSR International Pty Ltd. NVivo (Version 12). 2018. Available from:  
47 700 <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>
- 48 701 [35] Lincoln YS, Guba EG. *Naturalistic inquiry*. Sage Publications, 1985.

## BMJ Open

- 1  
2  
3 702 [36] Sayyed Kassem L, Aron DC. The assessment and management of quality of life of older  
4 703 adults with diabetes mellitus. *Expert Rev Endocrinol Metab*. 2020 Mar 3;15(2):71-81.  
5 704 [37] Skinner TC, Joensen L, Parkin T. Twenty-five years of diabetes distress research. *Diab*  
6 705 *Med*. 2020 Mar;37(3):393-400.  
7 706 [38] Robinson DJ, Coons M, Haensel H, et al. Diabetes and mental health. *Can J Diabetes* 2018  
8 707 Apr 1;42:S130-41.  
9 708 [39] Lynch CP, Gebregziabher M, Zhao Y, et al. Impact of medical and psychiatric multi-  
10 709 morbidity on mortality in diabetes: emerging evidence. *BMC Endocr Disord* 2014;14(1):1-8.  
11 710 [40] Kuluski K, Guilcher SJ. Toward a person-centred learning health system: Understanding  
12 711 value from the perspectives of patients and caregivers. *Healthc Pap* 2019;18(4):36-46.  
13 712 [41] Hellquist K, Bradley R, Grambart S, et al. Collaborative practice benefits patients: An  
14 713 examination of interprofessional approaches to diabetes care. *Health Interprofessional Pract*  
15 714 2012;1(eP1017).  
16 715 [42] O'Connor PJ, Desai J, Solberg LI, et al. Randomized trial of quality improvement  
17 716 intervention to improve diabetes care in primary care settings. *Diabetes Care* 2005;28,1890-97.  
18 717 [43] Valaitis RK, Wong ST, MacDonald M, et al. Addressing quadruple aims through primary  
19 718 care and public health collaboration: ten Canadian case studies. *BMC Public Health*  
20 719 2020;20(1):1-6.  
21 720 [44] Agency for Healthcare Research and Quality. About learning health systems. 2019.  
22 721 Available from: <https://www.ahrq.gov/learning-health-systems/about.html>. Accessed 12 Feb  
23 722 2022.  
24 723 [45] Rapid Improvement Support and Exchange. RISE brief 1. OHT (Ontario Health Team)  
25 724 building blocks. 2019. Available from: [https://www.mcmasterforum.org/docs/default-](https://www.mcmasterforum.org/docs/default-source/rise-docs/rise-briefs/rb1_oht-building-blocks.pdf?sfvrsn=71b154d5_27)  
26 725 [source/rise-docs/rise-briefs/rb1\\_oht-building-blocks.pdf?sfvrsn=71b154d5\\_27](https://www.mcmasterforum.org/docs/default-source/rise-docs/rise-briefs/rb1_oht-building-blocks.pdf?sfvrsn=71b154d5_27). Accessed 12 Feb  
27 726 2022.  
28 727 [46] Diabetes Canada. Summary of Diabetes Canada Diabetes 360° Ontario roundtable. 2019.  
29 728 Available from: [https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-](https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy_Roundtable-Summary_FINAL.pdf)  
30 729 [Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy\\_Roundtable-](https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy_Roundtable-Summary_FINAL.pdf)  
31 730 [Summary\\_FINAL.pdf](https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy_Roundtable-Summary_FINAL.pdf). Accessed 12 Feb 2022.  
32 731 [47] Clements JM, West BT, Yaker Z, et al. Disparities in diabetes-related multiple chronic  
33 732 conditions and mortality: The influence of race. *Diabetes Res Clin Pract* 2020;159(107984):1-  
34 733 19.  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## COREQ (CONsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
<b>Domain 1: Research team and reflexivity</b>			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	
Occupation	3	What was their occupation at the time of the study?	
Gender	4	Was the researcher male or female?	
Experience and training	5	What experience or training did the researcher have?	
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	
<b>Domain 2: Study design</b>			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	
Sample size	12	How many participants were in the study?	
Non-participation	13	How many people refused to participate or dropped out? Reasons?	
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	
<i>Data collection</i>			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	
Repeat interviews	18	Were repeat interviews carried out? If yes, how many?	
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	
Field notes	20	Were field notes made during and/or after the interview or focus group?	
Duration	21	What was the duration of the interviews or focus group?	
Data saturation	22	Was data saturation discussed?	
Transcripts returned	23	Were transcripts returned to participants for comment and/or	

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
<b>Domain 3: analysis and findings</b>			
<i>Data analysis</i>			
Number of data coders	24	How many data coders coded the data?	
Description of the coding tree	25	Did authors provide a description of the coding tree?	
Derivation of themes	26	Were themes identified in advance or derived from the data?	
Software	27	What software, if applicable, was used to manage the data?	
Participant checking	28	Did participants provide feedback on the findings?	
<i>Reporting</i>			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	
Data and findings consistent	30	Was there consistency between the data presented and the findings?	
Clarity of major themes	31	Were major themes clearly presented in the findings?	
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

**Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.**

# BMJ Open

## Older Adults' Experiences and Perceived Impacts of the Aging, Community and Health Research Unit – Community Partnership Program (ACHRU-CPP) for Diabetes Self-Management in Canada: A Qualitative Descriptive Study

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2022-068694.R2
Article Type:	Original research
Date Submitted by the Author:	06-Mar-2023
Complete List of Authors:	<p>Yous, Marie-Lee; McMaster University Faculty of Health Sciences, School of Nursing            Ganann, Rebecca; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Ploeg, Jenny ; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Markle-Reid, Maureen; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Northwood, Melissa ; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Fisher, Kathryn ; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Valaitis, Ruta; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Chambers, Tracey; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Montelpare, William; University of Prince Edward Island, Department of Applied Human Sciences, Faculty of Science            Légaré, France; VITAM Centre de recherche en santé durable; Laval University, Department of Family and Emergency Medicine, Faculty of Medicine            Beleno, Ron; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Gaudet, Gary; University of Prince Edward Island            Giacometti, Luisa; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Lively, Deborah; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Lindsay, Craig; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            Morrison, Allan; University of Prince Edward Island            Tang, Frank; McMaster University Faculty of Health Sciences, School of Nursing, Aging, Community and Health Research Unit            ACHRU-CPP Research Team, on behalf of the; McMaster University Faculty of Health Sciences, School of Nursing</p>
<b>Primary Subject Heading</b>:	Diabetes and endocrinology



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Secondary Subject Heading:	Qualitative research
Keywords:	QUALITATIVE RESEARCH, PRIMARY CARE, DIABETES & ENDOCRINOLOGY



BMJ Open: first published as 10.1136/bmjopen-2022-068694 on 5 April 2023. Downloaded from <http://bmjopen.bmj.com/> on April 22, 2024 by guest. Protected by copyright.



I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our [licence](#).

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which [Creative Commons](#) licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

BMJ Open

**Original Research**

**Title:** Older Adults' Experiences and Perceived Impacts of the Aging, Community and Health Research Unit – Community Partnership Program (ACHRU-CPP) for Diabetes Self-Management in Canada: A Qualitative Descriptive Study

**Corresponding Author:** Marie-Lee Yous, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, 1280 Main Street West, Room HSC 3N25, Hamilton, Ontario L8S 4K1, Canada, Email: [yousm@mcmaster.ca](mailto:yousm@mcmaster.ca); ORCID: 0000-0002-4271-0401

Marie-Lee Yous, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [yousm@mcmaster.ca](mailto:yousm@mcmaster.ca) ORCID: 0000-0002-4271-0401

Rebecca Ganann, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, email: [ganannrl@mcmaster.ca](mailto:ganannrl@mcmaster.ca) ORCID: 0000-0002-7566-8932

Jenny Ploeg, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [ploegi@mcmaster.ca](mailto:ploegi@mcmaster.ca) ORCID: 0000-0001-8168-8449

Maureen Markle-Reid, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [mreid@mcmaster.ca](mailto:mreid@mcmaster.ca) ORCID: 0000-0002-4019-7077

Melissa Northwood, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [northwm@mcmaster.ca](mailto:northwm@mcmaster.ca) ORCID: 0000-0001-5043-8068

Kathryn Fisher, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada [fisheka@mcmaster.ca](mailto:fisheka@mcmaster.ca) ORCID: 0000-0001-8342-1238

Ruta Valaitis, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [valaitis@mcmaster.ca](mailto:valaitis@mcmaster.ca) ORCID: [0000-0002-3117-0542](https://orcid.org/0000-0002-3117-0542)

Tracey Chambers, School of Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, email: [chambt@mcmaster.ca](mailto:chambt@mcmaster.ca) ORCID: 0000-0002-9325-6894

William Montelpare, Margaret and Wallace McCain Chair in Human Development and Health, Department of Applied Human Sciences, Faculty of Science, University of Prince Edward

## BMJ Open

1  
2  
3 45 Island, Charlottetown, Prince Edward Island, Canada, email: [wmontelpare@upei.ca](mailto:wmontelpare@upei.ca) ORCID:  
4 46 0000-0002-4167-4613  
5  
6

7 48 France Légaré, VITAM-Centre de recherche en santé durable, Université Laval, Québec City,  
8 49 Québec, Canada, email: [France.legare@fmed.ulaval.ca](mailto:France.legare@fmed.ulaval.ca) ORCID: 0000-0002-2296-6696  
9

10 51 Ron Beleno, Patient/Public Research Partner, Aging, Community and Health Research Unit,  
11 52 Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada email:  
12 53 [ron@rb33.com](mailto:ron@rb33.com)  
13

14 54  
15 55 Gary Gaudet, Patient/Public Research Partner, University of Prince Edward Island,  
16 56 Charlottetown, Prince Edward Island, Canada, email: [l.gaudet@bellaliant.net](mailto:l.gaudet@bellaliant.net)  
17 57

18 58 Luisa Giacometti, Patient/Public Research Partner, School of Nursing, Aging, Community and  
19 59 Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
20 60 Canada, email: [luisag@bell.net](mailto:luisag@bell.net)  
21 61

22 62 Deborah Levely, Patient/Public Research Partner, School of Nursing, Aging, Community and  
23 63 Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
24 64 Canada, email: [deborah.levely@rogers.com](mailto:deborah.levely@rogers.com)  
25 65

26 66  
27 66 Craig Lindsay, Patient/Public Research Partner, School of Nursing, Aging, Community and  
28 67 Health Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
29 68 Canada, email: [lindsay.cr@gmail.com](mailto:lindsay.cr@gmail.com)  
30 69

31 70  
32 70 Allan Morrison, Patient/Public Research Partner, University of Prince Edward Island,  
33 71 Charlottetown, Prince Edward Island, Canada, email: [allan.morrison62.am@gmail.com](mailto:allan.morrison62.am@gmail.com)  
34 72

35 73 Frank Tang, Patient/Public Research Partner, School of Nursing, Aging, Community and Health  
36 74 Research Unit, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada,  
37 75 email: [frankmtang@gmail.com](mailto:frankmtang@gmail.com)  
38 76

39 77  
40 77 **On behalf of the ACHRU-CPP Research Team**  
41 78

42 79 **Word count** excluding title page, abstract, references, figures and tables (**max 4,000**): 4,721  
43 80  
44 81  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57

## BMJ Open

1  
2  
3 82 **Abstract (max 300 words):** 300 words  
4

5 83 **Objectives:** To assess the experiences and perceived impacts of the Aging, Community and  
6  
7  
8 84 Health Research Unit – Community Partnership Program (ACHRU-CPP) from the perspectives  
9  
10 85 of older adults with diabetes and other chronic conditions. The ACHRU-CPP is a complex 6-  
11  
12 86 month self-management evidence-based intervention for community-living older adults aged 65  
13  
14 87 years or older with Type 1 or Type 2 diabetes and at least one other chronic condition. It includes  
15  
16 88 home and phone visits, care coordination, system navigation support, caregiver support, and  
17  
18 89 group wellness sessions delivered by a nurse, dietitian or nutritionist, and community program  
19  
20  
21 90 coordinator.

22  
23  
24 91 **Design:** Qualitative descriptive design embedded within a randomized controlled trial was used.  
25

26 92 **Setting:** Six trial sites offering primary care services from three Canadian provinces (i.e.,  
27  
28 93 Ontario, Quebec, and Prince Edward Island) were included.  
29

30  
31 94 **Participants:** The sample was 45 community-living older adults aged 65 years or older with  
32  
33 95 diabetes and at least one other chronic condition.  
34

35 96 **Methods:** Participants completed semi-structured post-intervention interviews by phone in  
36  
37  
38 97 English or French. The analytical process followed Braun and Clarke's experiential thematic  
39  
40 98 analysis framework. Patient partners informed study design and interpretation.  
41

42 99 **Results:** The mean age of older adults was 71.7 years, and the mean length of time living with  
43  
44  
45 100 diabetes was 18.8 years. Older adults reported positive experiences with the ACHRU-CPP that  
46  
47 101 supported diabetes self-management such as, improved knowledge in managing diabetes and  
48  
49 102 other chronic conditions, enhanced physical activity and function, improved eating habits, and  
50  
51 103 opportunities for socialization. They reported being connected to community resources by the  
52  
53 104 intervention team to address social determinants of health and support self-management.  
54  
55  
56  
57  
58  
59  
60

BMJ Open

1  
2  
3 105 **Conclusions:** Older adults perceived that a 6-month person-centred intervention collaboratively  
4  
5 106 delivered by a team of health and social care providers helped support chronic disease self-  
6  
7 107 management. There is a need for providers to help older adults connect with available health and  
8  
9 108 social services in the community.  
10  
11  
12  
13

#### 14 110 **Strengths and limitations of this study**

- 17 111 • This study included a rigorous qualitative design with a large sample size.
- 18  
19 112 • A rigorous analytic method was used involving multiple researchers with expertise in  
20  
21 113 primary care, qualitative, ageing, and diabetes research, as well as programme evaluation.  
22  
23  
24 114 • Patient and public research partners were involved in designing the intervention,  
25  
26 115 informing the study design and interview guides, interpreting the results, and developing  
27  
28 116 the manuscript.
- 29  
30  
31 117 • A limitation of the study was related to the sample as there was a lack of cultural  
32  
33 118 diversity with regards to ethnicity and under-representation of older adults from  
34  
35 119 marginalized communities.  
36  
37

38 120  
39  
40 121 **Keywords:** diabetes self-management, older adults, community, primary care, qualitative  
41  
42 122  
43  
44 123  
45  
46 124  
47  
48 125  
49  
50 126  
51  
52 127  
53  
54  
55  
56  
57

## 128 Introduction

129 As of 2022, approximately 422 million people have been diagnosed with diabetes  
130 mellitus worldwide [1]. Older adults are more likely to have Type 2 diabetes than younger adults  
131 [2] and are at risk for hypoglycemia which can adversely affect cognition, vision, hearing,  
132 mobility, and mental health [3] as well as self-care activities including exercise and diet. More  
133 than 40% of older adults with diabetes have three or more chronic conditions [4], including  
134 hyperlipidemia, hypertension, asthma, chronic obstructive pulmonary disease, chronic kidney  
135 disease, arthritis, and heart failure [5]. Following management plans for one condition may be  
136 challenging due to symptoms or conflicting guidelines from another condition. Higher burden  
137 associated with the presence of multiple chronic conditions (MCC) has been linked to higher risk  
138 for mortality, decreased physical and mental functioning, and increased health services use [2, 6,  
139 7]. Community-dwelling older adults with MCC are highly reliant on family/friend caregivers  
140 for support [8], which can lead to poor mental and physical health, and financial losses among  
141 caregivers [9]. Caregivers' unmet needs [10] can lead to their increased use of hospital and  
142 emergency services.

143 Complex health interventions are defined as having multiple interacting components [11].  
144 For older adults with diabetes, complex health interventions such as peer support programs, have  
145 demonstrated positive effects in managing their complex needs, sustaining lifestyle changes, and  
146 achieving health benefits [12-17]. Complex interventions that target self-care and incorporate  
147 opportunities for peer-to-peer discussions among community-dwelling older adults can improve  
148 their mental and physical health and reduce falls [18, 19]. Nurse-led self-management programs  
149 for diabetes and other chronic conditions can lead to improvements in self-rated health, glycated  
150 hemoglobin (HbA1c) values, blood pressure, weight, and self-management behaviours [19, 20].

## BMJ Open

1  
2  
3 151 Providing diabetes self-management programs through partnerships between primary care and  
4  
5 152 community organizations (e.g., senior centres, YMCA) supports program uptake,  
6  
7 153 implementation, and sustainability [12], which can lead to improved health literacy (i.e., being  
8  
9 154 able to locate, read and understand health information for informed decision-making). In a  
10  
11 155 systematic review of randomized controlled trials (RCTs), health literacy was instrumental in  
12  
13 156 enhancing diabetes knowledge, self-efficacy, and physical activity [21].  
14

15  
16  
17 157 Receiving care from multiple providers from different health and community settings can  
18  
19 158 lead to fragmented care for older adults, as referrals across organizations are often not well  
20  
21 159 integrated [22]. Seamless care coordination and system navigation for older adults with MCC  
22  
23 160 remain high priorities for this population. There is a need for innovative programs for older  
24  
25 161 adults that focus on the Quintuple Aims of high-quality care: (a) enhancing the patient  
26  
27 162 experience of care; (b) creating healthy populations; (c) reducing healthcare costs; (d) improving  
28  
29 163 the care delivery experience; and (e) health equity [23]. Gaps in previous intervention designs  
30  
31 164 include lack of emphasis on patient experience of care and considerations for health equity [23].  
32  
33

34  
35 165 The Aging, Community and Health Research Unit – Community Partnership Program  
36  
37 166 (ACHRU-CPP) is a 6-month self-management intervention for community-living older adults ( $\geq$   
38  
39 167 65 years old), diagnosed with Type 1 or Type 2 diabetes and at least one other chronic condition,  
40  
41 168 and their family/friend caregivers ( $\geq$  18 years old). The intervention was evaluated in a  
42  
43 169 feasibility study in Ontario, Canada [24], followed by a clinical trial in selected primary care and  
44  
45 170 community settings in two Canadian provinces (Ontario and Alberta) [25-27]. A multi-  
46  
47 171 jurisdictional pragmatic RCT is currently in progress to evaluate the implementation and  
48  
49 172 effectiveness of the ACHRU-CPP in three Canadian provinces. To better understand how to  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



## BMJ Open

173 address the complex needs of older adults, we sought to assess the experiences and perceived  
 174 impacts of the ACHRUCPP from the perspectives of older adults with diabetes and MCC.

175

176

**Methods****Design**

178 This qualitative study is embedded within the multi-site implementation-effectiveness  
 179 type II hybrid RCT, as outlined in the protocol paper [28]. This study used a qualitative  
 180 descriptive design, as described by Sandelowski [29, 30], to provide a fulsome summary while  
 181 remaining close to the words of participants when describing their experiences with the  
 182 ACHRUCPP and its perceived impacts.

**ACHRUCPP Program**

184 The ACHRUCPP is delivered by an interprofessional team of primary care providers,  
 185 which includes a Registered Nurse (RN) and Registered Dietitian (RD) or Nutritionist from a  
 186 primary care setting, and a Program Coordinator (e.g., Registered Kinesiologist) from a local  
 187 community partner organization (hereafter referred to as the intervention team). Table 1  
 188 summarizes the core components of the ACHRUCPP. Due to the COVID-19 pandemic some  
 189 participants received virtual visits by phone or videoconferencing. A comparison of results from  
 190 the virtual and in-person approaches will be published in a future paper.

191

**Table 1.** The ACHRUCPP five core components

Intervention Components	Goals
1. Home/virtual visits (up to 3 home visits) and unlimited follow-up phone calls by a RN and/or RD or Nutritionist	To assess older adults' and caregivers' needs and goals using standardized tools to support a coordinated care plan
2. Monthly group wellness sessions (up to 6 sessions) at a local community centre led by	To provide older adults and caregivers with gentle progressive physical activity, self-

## BMJ Open

Intervention Components	Goals
the RN, RD or Nutritionist and Community Program Coordinator	management education for diabetes and other chronic conditions, and healthy lunches and snacks
3. Monthly team case conferences which include a RN, RD or Nutritionist, and Community Program Coordinator	To discuss the health and social care needs of older adults and caregivers, develop and revise the coordinated care plan, and plan topics for group wellness sessions
4. Collaboration with the primary care interprofessional team and other specialists (e.g., family physicians, nurse practitioners, kinesiologists, social workers, home care and social service providers, pharmacists, endocrinologists)	To support primary care and community providers in working collaboratively to develop care plans for older adults, and connect older adults and caregivers to specialists and community resources
5. Nurse-led care coordination/system navigation	To facilitate linkages to other primary healthcare providers, specialists and community care services for older adults and caregivers

193 *Note.* RN = Registered Nurse; RD = Registered Dietitian

194

### 195 Patient and Public Involvement

196 The need for the program was originally identified by community-dwelling older adults  
 197 with diabetes and other chronic conditions and their caregivers and was subsequently co-  
 198 designed by older adults in collaboration with primary and community care providers and  
 199 researchers [24]. In the current RCT, patient partners from the pan-Canadian Steering Committee  
 200 were involved in reviewing research questions and advising the research team on the selection of  
 201 outcome measures [28]. Patient and public research partners also participated in local  
 202 Community Advisory Boards in each site to inform further adaptations to the intervention and  
 203 support local implementation. Patient and public research partners from the local community  
 204 advisory boards (RB, GG, LG, CL, DL, AM) and the Steering Committee (LM, FT) also  
 205 provided input into development of this manuscript by reviewing and interpreting the results and  
 206 helping to shape the key messages.

BMJ Open

**207 Setting**

208 The study was conducted in two sites in Ontario, Quebec, and Prince Edward Island,  
209 Canada. Each of the six sites was selected to ensure variability in geographic setting (urban and  
210 rural); socio-demographic and cultural backgrounds; language spoken (English or French);  
211 demonstrated support for the ACHRUCPP; and the presence of staff to support intervention  
212 implementation. An RN and RD or Nutritionist from a primary care setting or diabetes education  
213 program worked in partnership with a program coordinator from a local community partner site  
214 (e.g., YMCA) to implement the program.

**215 Sample and Recruitment**

216 Older adults were screened for eligibility to participate in the RCT by a trained staff  
217 member of the primary care site, as described in the study protocol [28]. Eligible patients met the  
218 following inclusion criteria: (a) aged 65 years or older; (b) diagnosis of Type 1 or Type 2  
219 diabetes with at least one other chronic condition; (c) receiving primary care services from one  
220 of the participating primary care settings; (d) living within the area served by the primary care  
221 setting and community site; (e) able to provide informed consent or has a substitute decision-  
222 maker able to provide informed consent on the patient's behalf; and (f) competent in English or  
223 French, or has an interpreter competent in English or French.

224 Following the completion of baseline interviews, patients were randomized to receive the  
225 intervention (i.e., ACHRUCPP) in addition to usual care or usual care alone. A total of 8-10  
226 older adults per site who completed the 6-month intervention were invited to participate in  
227 follow-up telephone interviews. Trained research assistants (MY, RC), with no prior relationship  
228 with participants, used a telephone script to call selected older adults within two weeks of  
229 completing the ACHRUCPP, to invite them to participate in a telephone interview. Maximum

## BMJ Open

230 variation purposive sampling [31] was used to select a diverse sample of participants across all 6  
 231 sites based on their sex, annual income, ethnicity, and level of participation in all components of  
 232 the study.

### 233 Data Collection

234 Semi-structured post-intervention telephone interviews were conducted between April  
 235 2020 and August 2021. Trained research assistants conducted audio-recorded interviews, ranging  
 236 from 20 to 60 minutes in length, in English or French. Interviews were transcribed verbatim by  
 237 experienced transcriptionists. Interviews conducted in English were transcribed and cleaned by  
 238 trained research staff, while interviews conducted in French were transcribed and translated into  
 239 English by professional transcriptionists and later validated by a bilingual member of the  
 240 research team. Transcripts were not returned to participants for their review. The interview guide  
 241 was created based on: (a) a review of the literature of health and social needs of older adults and  
 242 caregivers, patient-provider communication, and system navigation and (b) feedback from  
 243 patient partners and the research team with expertise in aging, community-based supports for  
 244 older adults and caregivers, and qualitative research. Table 2 provides sample interview  
 245 questions.

247 **Table 2.** Sample interview questions for older adults

<b>Questions for Older Adults</b>
1. What did you need the most in the past six months (e.g., physical, emotional, mental or psychological support, transportation, financial assistance, housekeeping, personal care support)?
2. When [name of nurse and dietitian] visited you what types of things did they do during those visits?

## BMJ Open

3. For other people who are living with diabetes and other chronic conditions, would you recommend that a nurse or dietitian, such as [name of nurse and dietitian], visit the person at home, make phone calls or both?

4. What types of things did you do at the monthly wellness sessions or during the individual calls with [name of the community program coordinator]?

5. How, if at all, did [name of nurse and dietitian] involve you in decisions about your care?

6. How, if at all, did [name of nurse and dietitian] help you to connect with other community health or social services to help you?

7. To what extent did the nurse and dietitian help to address your needs or the issues that were most important to you?

8. How happy are you with the overall care that you received from [name of nurse and dietitian]?

9. Was the information given by [name of nurse and dietitian] and other health professionals about care consistent (across individuals)?

10. Is there anything else about your experiences with [name of nurse and dietitian] that you would like to add that we haven't already discussed?

248

249 **Data Analysis**

250 Themes were generated using the Braun and Clarke's experiential thematic analysis  
 251 framework [32] and organized under relevant constructs of the Consolidated Framework for  
 252 Implementation Research [33]. Thematic analysis was selected to ensure that the development of  
 253 themes was informed by the experiences and perceived intervention benefits of older adults. The  
 254 six phases of thematic analysis include: (a) becoming familiar with the data; (b) coding; (c)  
 255 developing themes; (d) reviewing themes; (e) constructing a definition for themes and labelling  
 256 them; and (f) creating a report [32]. A female research assistant with doctoral level training in  
 257 qualitative research (MY) used the data management software NVivo version 12 [34] to perform  
 258 coding. MY is fluent in both languages and coded in English. Results were shared with the team

## BMJ Open

259 in English only. Following the creation of codes, these were further examined for patterns to  
260 generate themes. Themes were shared with the research team, including patient partners, to  
261 ensure they were reflective of the data.

**262 Rigour and Trustworthiness**

263 Consensus was reached by all authors prior to the inclusion of themes in the final report.  
264 Lincoln and Guba's validation criteria [35] were applied in this study to enhance the study's  
265 rigour. To support the credibility of findings, investigator triangulation was used in data analysis  
266 through team meetings with 5-7 members to review the coding structure and evidence of themes.  
267 These members included patient and public research partners and researchers of various  
268 disciplines with expertise in qualitative research, gerontology, and community-based  
269 interventions. Conflicts were resolved through team consensus. To facilitate transferability of  
270 findings, the study sample and setting were described in detail. To support dependability and  
271 confirmability of findings, the research team kept an audit trail of study processes.

272

273

**Results**

274 A total of 295 older adults were enrolled in the RCT and randomly allocated to receive  
275 the ACHRU-CPP or usual care. At the time of data collection, 53 older adults who had  
276 completed the 6-month intervention were approached to participate in the qualitative interviews  
277 and 45 accepted (84.9%). The rate of acceptance by site was as follows: Site 1, 100% (10/10);  
278 Site 2, 89.9% (8/9); Site 3, 89.9% (8/9); Site 4, 60% (6/10); Site 5, 100% (8/8); and Site 6,  
279 71.4% (5/7). Out of the 45 participants, there was good uptake of home visits with a mean of 3.1  
280 (SD (standard deviation) = 1.5) and group wellness sessions with a mean of 2.7 (SD = 1.9).  
281 Where the providers deemed clinically necessary participants received more than the allotted 3

## BMJ Open

282 home visits. Competing commitments such as doctor appointments and lack of interest were  
 283 barriers to attending group wellness sessions for some participants.

### 284 *Demographic Characteristics*

285 The mean age of the 45 older adults who participated in interviews was 71.1 years and  
 286 the mean length of time living with diabetes was 18.8 years (SD = 10.6). Most were female  
 287 (55.6%), retired from paid work (80%), had Type 2 diabetes (93.3%), and reported 4-6 chronic  
 288 conditions (44.4%). Hypertension, hyperlipidemia, and osteoarthritis and other arthritis (e.g.,  
 289 rheumatoid arthritis) were the most reported chronic conditions. Table 3 summarizes  
 290 demographic characteristics of participants.

292 **Table 3.** Demographic characteristics of interview participants

Older Adults (n=45)	
Category	n (%)
Age (mean [Standard Deviation]): 71.7 [6.5]	
65-70	26 (57.8)
71-75	7 (15.6)
76+	12 (26.7)
Sex	
Female	25 (55.6)
Male	20 (44.4)
Marital Status	
Married or living with a partner	21 (46.7)
Divorced, never married, separated, or widowed	23 (51.1)
Refused	1 (2.2)
Highest Level of Education	
Completed a graduate or professional degree	6 (13.3)
Completed a bachelor's degree	10 (22.2)
Had some university education or completed a community college, technical college, or postsecondary program	12 (26.7)
Completed secondary school	10 (22.2)
Did not complete secondary school	7 (15.6)
Current Employment Status	

BMJ Open

<b>Older Adults (n=45)</b>	
<b>Category</b>	<b>n (%)</b>
Retired from paid work	36 (80.0)
Employed full-time	4 (8.9)
Employed part-time	2 (4.4)
Unemployed and looking for work	1 (2.2)
Refused	2 (4.4)
<b>Annual Household Income</b>	
\$150,000 or more	2 (4.4)
\$100,000 or more, but less than \$150,000	2 (4.4)
\$50,000 or more, but less than \$100,000	12 (26.7)
\$20,000 or more, but less than \$50,000	16 (35.6)
Less than \$20,000	11 (24.4)
Refused	2 (4.4)
<b>Born in Canada</b>	
Yes	31 (68.9)
<b>Ethnic/Racial Group</b>	
White/Caucasian	32 (71.1)
Black	3 (6.7)
Caribbean/Guyanese	3 (6.7)
Filipino	2 (4.4)
First Nations	1 (2.2)
South Asian	1 (2.2)
Southeast Asian	1 (2.2)
Chinese	1 (2.2)
Japanese	1 (2.2)
<b>Language(s) Spoken</b>	
English	37 (82.2)
French	15 (33.3)
<b>Living with Others (e.g., spouse, children, other relative, friend, group setting)</b>	
Yes	27 (60.0)
<b>Type of Diabetes</b>	
Type 1 diabetes	1 (2.2)
Type 2 diabetes	42 (93.3)
Unknown	2 (4.4)
<b>Number of Chronic Conditions (mean [Standard Deviation]): 5.6 [2.9]</b>	
1-3	11 (24.4)
4-6	20 (44.4)
7-9	8 (17.8)
10 +	6 (13.3)
<b>Commonly Reported Chronic Conditions</b>	
Hypertension	34 (75.6)
Hyperlipidemia	27 (60.0)
Osteoarthritis and other arthritis	18 (40.0)
Cardiovascular disease	16 (35.6)



## BMJ Open

Older Adults (n=45)	
Category	n (%)
At Least 1 Emergency Room Visit in the Last 6 Months	
6 months prior to ACHRUCPP	8 (17.8)
6-month follow-up	7 (15.6)

293

294 **Themes**

295 Themes were grouped into two categories, experiences, and perceived impacts of the  
 296 ACHRUCPP. Table 4 provides an overview of themes. The words in italics that label the theme  
 297 are taken verbatim from transcripts. Similarly, participant quotes in the narrative that follows are  
 298 noted in italics and identified by OA for older adult, # for site number, and ### for participant  
 299 number.

300

301 **Table 4.** Themes of older adult experiences and perceived impacts with the ACHRUCPP

302

Experiences with the ACHRUCPP
<ul style="list-style-type: none"> <li>• In-depth dialogue with “<i>professional friends</i>”</li> <li>• Socialized with “<i>people with the same type of health problems</i>”</li> <li>• Person-centred care by “<i>more than one knowledgeable person</i>”</li> <li>• Ongoing contact with providers so “<i>you are not alone</i>”</li> <li>• Need to address ethnic/cultural differences through a “<i>personal session</i>”</li> </ul>
Perceived Impacts of the ACHRUCPP
<ul style="list-style-type: none"> <li>• Improved diabetes self-management behaviours: “<i>make more proactive steps</i>”</li> <li>• Added connection to health and social support services “<i>that could help me</i>”</li> </ul>

303

304

BMJ Open

305

**306 Experiences with the ACHRUCPP**

307 Overall, older adults reported positive experiences with the ACHRUCPP. They  
308 experienced: (a) in-depth dialogue with “*professional friends*”; (b) socialized with “*people with*  
309 *the same type of health problems*”; (c) person-centred care by “*more than one knowledgeable*  
310 *person*”; (d) ongoing contact with providers so “*you are not alone*”; and identified the (e) need  
311 to address ethnic/cultural differences: “*eating has to do with seasons*”.

312 **In-depth dialogue with “*professional friends*”.** In-person home and virtual visits were  
313 perceived by older adults as more relaxed compared to clinic visits and provided opportunities  
314 for in-depth dialogue about health and social issues with providers. “*The home visits are more*  
315 *relaxed, if you were at a clinic, you got a time slot you got to meet whatever is transacted in that*  
316 *timeframe*” (OA\_1\_152). Findings revealed that older adults had a lot of concerns and questions  
317 regarding diabetes and other chronic conditions that were often left unanswered by providers due  
318 to the nature of clinic visits that are limited by time and ailment. Home visits helped to build  
319 trust between older adults and the providers, which facilitated the exploration of concerns and  
320 needs beyond diabetes such as safe housing and transportation issues. “*I felt I could trust her*  
321 *[nutritionist]*” (OA\_5\_037). Providers were approachable and understanding of older adults’  
322 situations and were considered as friends and confidants. “*They [providers] were professional*  
323 *friends*” (OA\_2\_242). Their approach was especially important when discussing sensitive topics  
324 such as mental health concerns. “*I had my sick niece calling me and that was stressing me, so she*  
325 *[nurse] said to “Let go. When we are stressed, that’s not always good”. So how to manage my*  
326 *stress*” (OA\_6\_023).

## BMJ Open

1  
2  
3 327 **Socialized with “people with the same type of health problems”.** Older adults and  
4  
5 328 caregivers perceived that group wellness sessions helped them meet others who understood what  
6  
7 329 it is like to live with diabetes and other chronic conditions. *“The fact of socializing with other*  
8  
9 330 *people with the same types of health problems as we do”* (OA\_5\_037). Learning about the  
10  
11 331 burden that others experience with their conditions encouraged older adults to support each other  
12  
13 332 and express their frustrations. The sessions provided opportunities for group exercises which  
14  
15 333 provided peer motivation. The group sessions were particularly helpful for older adults who were  
16  
17 334 socially isolated, and some older adults became friends because of the sessions.

18  
19 335 **Person-centred care by “more than one knowledgeable person”.** Older adults  
20  
21 336 appreciated that they received person-centred care from a team of providers through the  
22  
23 337 ACHRU-CPP to discuss diabetes, their other chronic conditions, and social concerns. Some  
24  
25 338 older adults perceived that in usual care providers at times delivered care in silos or independent  
26  
27 339 of other disciplines. Older adults valued providers working collaboratively to meet their needs.  
28  
29 340 *“It was good that they worked in a team. More than one knowledgeable person. That was*  
30  
31 341 *important”* (OA\_2\_242). They felt that providers were listening to their concerns and that, prior  
32  
33 342 to meeting with the intervention team, it was difficult to find the right person to talk to about  
34  
35 343 diabetes.

36  
37 344 *I enjoyed having them come to visit. I don't talk to a lot of people about my diabetes because*  
38  
39 345 *I don't feel it's that complicated, but nobody really wants to listen about your health issues.*  
40  
41 346 (OA\_3\_032)

42  
43 347 Providers supported the management of other conditions in addition to diabetes. *“I was having*  
44  
45 348 *troubles with my bowels, but we got that regulated and it's good”* (OA\_4\_075).

46  
47 350 **Ongoing contact with providers so “you are not alone”.** Providers made older adults  
48  
49 351 feel that someone was concerned about their well-being. *“It's not as if we are just left alone with*

BMJ Open

352 *our problems. What you are doing is very good; continue*” (OA\_5\_128). Managing diabetes and  
353 MCC felt burdensome for older adults, and they appreciated regular contact with providers.  
354 Follow-up phone calls were well received by older adults, especially by those living alone or  
355 with little support, and ensured that they *“haven’t fallen through the cracks”* (OA\_3\_058). The  
356 ongoing follow-up with the team reinforced familiar information that older adults had forgotten  
357 to put into practice over time. A few participants reported that once the intervention stopped at  
358 the 6-month period they felt that there was a break in the social connection with peers and formal  
359 providers.

360 **Need to address ethnic/cultural differences through a “personal session”.** Some  
361 ethnic groups may have language barriers and be *“very shy and they don’t approach people  
362 unless someone else pushes them to go [join programs]”* (OA\_1\_061). Some older adults  
363 perceived that individual wellness sessions with providers may be helpful for those with  
364 language barriers. *“Some of them had a bit of a language problem. I think a personal session  
365 would be much more helpful”* (OA\_2\_086). The following challenge experienced by one  
366 participant also exemplifies the need to provide dedicated time, encouragement and support for  
367 older adults to share their personal cultural practices during interactions with peers and  
368 providers.

369 *One of the things I learned about myself from my community [Indigenous community] and  
370 my family is that eating has to do with seasons...Your year-round diet has to do with what’s  
371 available to you...I mentioned that one time in the group [Group Wellness Sessions]and they  
372 thought that had nothing to do with what the topics were.* (OA\_2\_013)

374 Providing opportunities to discuss cultural practices promotes diversity within groups and  
375 learning across cultures.

376  
377 ***Perceived Impacts***

## BMJ Open

1  
2  
3 378 Older adults perceived that the ACHRUCPP had positive impacts on their health and  
4  
5 379 well-being as a result of: (a) improved diabetes self-management behaviours: “*make more*  
6  
7 380 *proactive steps*” and (b) added connection to health and social support services “*that could help*  
8  
9 381 *me*”.

10  
11  
12 382 **Improved diabetes self-management behaviours: “*make more proactive steps*”.** Older  
13  
14 383 adults felt that the ACHRUCPP helped them to recognize and take more action in preventing  
15  
16 384 complications, such as hypoglycemia and hyperglycemia, and decreasing their blood pressure, as  
17  
18 385 described in the following quote. They recognized that reaching a level of effective self-  
19  
20 386 management of chronic conditions can be complicated and they appreciated the support provided  
21  
22 387 through the ACHRUCPP.

23  
24  
25  
26 388 *What [the nurse] and [dietitian] caused me to be concerned about is to make more proactive*  
27 389 *steps, to watch out for those low blood sugars. I really didn't realize how badly they could*  
28 390 *affect you. Shaking and double vision is one thing but not being able to drive, that's quite*  
29 391 *another thing. (OA\_2\_242)*

30  
31 392  
32 393 Older adults indicated that they gained nutrition knowledge by participating in the  
33  
34 394 ACHRUCPP. “*I improved it [eating habits]. I had to eat more fruit and vegetables...and after*  
35  
36 395 *that, I had to hydrate myself more and add more fibre to my diet*” (OA\_5\_027). Older adults  
37  
38 396 perceived that changes made to their diet could lead to multiple benefits including weight loss  
39  
40 397 and decreased sugar levels. “*...drinking more water and diet, I think that's what was important,*  
41  
42 398 *and I lost weight at the same time. By eating well, fewer treats, being more careful, the sugar*  
43  
44 399 *levels were lower*” (OA\_6\_005).

45  
46  
47  
48 400 Older adults perceived they were able to build more muscle mass and lose weight and  
49  
50 401 experienced less difficulty in climbing stairs. Some older adults felt that they were not exercising  
51  
52 402 enough prior to participating in the ACHRUCPP and perceived that the providers helped them  
53  
54 403 to meet their activity goals.

## BMJ Open

1  
2  
3 404 *They really helped me with the exercise piece. I had poor balance. It was the [nurse and*  
4 405 *dietitian] that really said ‘why don’t you try doing this? I’ll give you a call this week and see*  
5 406 *if you got out to do your walk’, and then I’d promise them that I would start journaling my*  
6 407 *steps so little by little I started increasing my exercise. (OA\_2\_247)*  
7 408

8 409 **Added connection to health and social support services “that could help me”.** Older  
9  
10  
11 410 adults indicated that they were referred to and connected with health and social support services  
12  
13 411 (e.g., food bank, exercise program, smoking cessation, home care, social work, arts program).  
14  
15 412 Living well with diabetes and other chronic conditions was perceived by older adults to require  
16  
17 413 more than just medical care. Some older adults required supports to meet their basic needs, as  
18  
19 414 they were not able to afford groceries or travel far distances for groceries and medications. “*She*  
20  
21 415 *[nurse] referred me [for medication delivery]” (OA\_1\_061).* Some older adults required mental  
22  
23 416 health support to enhance their ability to manage diabetes and other chronic conditions. The  
24  
25 417 intervention team followed-up with older adults after making referrals to ensure that they were  
26  
27 418 connected. Older adults were referred to local community resources that offered free or low-cost  
28  
29 419 services. “*They told me I could go to [name of community centre] to do exercise” (OA\_4\_016).*  
30  
31 420 Prior to participating in the ACHRU-CPP older adults indicated that they had seldom been  
32  
33 421 referred to programs outside of the clinic and therefore they were not aware of available  
34  
35 422 community resources.

36  
37 423 Older adults found it important to be aware of publicly-funded resources, such as tax  
38  
39 424 rebates and housing options, in case they or their loved one required these in the future. By  
40  
41 425 attending group wellness sessions, they learned about the types of programs the community  
42  
43 426 partner sites had to offer. “*They [community partner site] have virtual classes and they’re all*  
44  
45 427 *free. They have special classes just for seniors” (OA\_2\_013).* Despite the mostly positive  
46  
47 428 impacts of being connected with relevant health and social services, some participants reported  
48  
49 429 that not all of their needs were met at the group wellness sessions. For example, some did not  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

BMJ Open

1  
2  
3 430 qualify for certain financial assistance programs. “*They just said you have to qualify [for*  
4  
5 431 *financial assistance] because...you have to apply for this, you have to apply for this”*  
6  
7  
8 432 (OA\_1\_058). Some participants reported that it was difficult to absorb all of the information  
9  
10 433 presented and not all of the information was relevant to their situation. It was challenging to  
11  
12 434 tailor group wellness sessions to individual needs compared to home visits which allowed further  
13  
14 435 individualized tailoring.  
15  
16  
17 436  
18

## 19 437 **Discussion**

20  
21 438 Key findings of this study were that the ACHRU-CPP increased in-depth dialogue with  
22  
23 439 ‘*professional friends*’ and provided person-centred care and ongoing contact with providers to  
24  
25 440 prevent feelings of being alone. The use of a social determinants of health approach by the  
26  
27 441 intervention teams was a novel component of the program and highlighted the importance of  
28  
29 442 addressing social aspects of care for older adults with diabetes and MCC. Group interactions  
30  
31 443 brought together participants with the same type of health issues and provided peer motivation  
32  
33 444 and support. Participants identified that the program would benefit from adaptations to address  
34  
35 445 cultural and language differences among older adults living with diabetes and other conditions in  
36  
37 446 Canada.  
38  
39  
40

41  
42 447 Older adults with multimorbidity and diabetes face significant burden in managing their  
43  
44 448 chronic conditions, which challenge their self-care and adversely affect their overall quality of  
45  
46 449 life [36]. In addition to managing diabetes symptoms and complications (e.g., hypoglycemia and  
47  
48 450 hyperglycemia, visual impairment, neuropathy) which negatively impact their physical  
49  
50 451 functioning, older adults with diabetes often experience psychological burden associated with  
51  
52 452 complex medication and diet regimens (e.g., medication and insulin management and glycemic  
53  
54  
55  
56  
57  
58  
59  
60

BMJ Open

1  
2  
3 453 control) [36]. Added pressures include financial burden, food insecurity, social isolation, lack of  
4  
5 454 social support, as well as frailty, and the burden of comorbid chronic conditions, e.g., anxiety,  
6  
7 455 depression [36]. Several of these challenges were experienced by our study participants. The  
8  
9 456 largely positive response to the program could be attributed to the support that participants  
10  
11 457 received in managing the burden associated with living with diabetes and other chronic  
12  
13 458 conditions. High quality care for this population to prevent diabetes distress (i.e., challenges  
14  
15 459 faced when dealing with the demands of diabetes), requires good communication and trusting  
16  
17 460 relationships with providers, social and peer support, and self-management education [37].  
18  
19  
20

21 461 A novel finding of this study was that the ACHRUCPP was perceived by older adults  
22  
23 462 from three Canadian provinces to positively impact their self-management practices of diabetes  
24  
25 463 and MCC by helping to address their broad health and social needs. This has not been  
26  
27 464 documented before in similar studies [19, 20]. This may be because the ACHRUCPP was longer  
28  
29 465 and more person-centred compared to other interventions. Interventionists were able to directly  
30  
31 466 assess the home context and understand the impacts of social determinants of health. Mental  
32  
33 467 health concerns and lack of support, which were experienced by our study participants, can  
34  
35 468 impact the ability of older adults to effectively manage diabetes and lead to severe  
36  
37 469 hypoglycemia, elevated HbA1c levels, a greater number of missed insulin doses, and a higher  
38  
39 470 risk for diabetic ketoacidosis and mortality [38, 39, 3].  
40  
41  
42  
43

44 471 When healthcare providers recommend lifestyle changes, they need to recognize that  
45  
46 472 social determinants of health such as housing, food security, social relationships, and financial  
47  
48 473 stability have an impact on older adults' abilities to enact them [40]. In the current study, the  
49  
50 474 intervention team assessed the social determinants of health and found ways to address them,  
51  
52 475 such as by linking older adults with relevant community resources, to help overcome barriers to  
53  
54  
55  
56  
57



## BMJ Open

1  
2  
3 476 self-management. The intervention team targeted health literacy of older adults and caregivers  
4  
5 477 through education, capacity building, and opportunities for dialogue among peers and experts.  
6  
7

8 478 In the current study, older adults appreciated receiving person-centred care supported by  
9  
10 479 a team of providers from primary care and community sectors and the engagement of providers  
11  
12 480 outside of the intervention team (such as social workers). Due to the complex nature of diabetes  
13  
14 481 and MCC, interprofessional collaboration has been found to lead to positive outcomes for  
15  
16 482 persons with Type 2 diabetes, such as improvements in HbA1c levels, regular testing of blood  
17  
18 483 glucose levels, and smoking cessation [41, 42].  
19  
20

21 484 What is unique about this study is the partnership between healthcare providers and a  
22  
23 485 Program Coordinator from a local community partner site. These health and social services can  
24  
25 486 be underutilized if healthcare providers are not aware of them. As per the Quintuple Aim [23]  
26  
27 487 there is a need to optimize the use of existing community-based services for patients, address any  
28  
29 488 barriers to accessing these services, and for strong coordination of services [43].  
30  
31  
32

33 489 Person-centred care was perceived to be key strength of the ACHRU-CPP that enabled  
34  
35 490 older adults to improve self-management practices related to diabetes and MCC. In working  
36  
37 491 towards a person-centred learning health system, defined as a health system that integrates  
38  
39 492 internal data, patient experience, and research evidence [44], the priorities and experiences of  
40  
41 493 older adults should be regularly reported in data systems so that services that meet their needs are  
42  
43 494 developed and evaluated as part of continuous quality improvement processes [38]. As seen in  
44  
45 495 this study, patient experience can be improved by having a provider connect patients with other  
46  
47 496 interdisciplinary health and social care providers to ensure that smooth transitions between  
48  
49 497 services occur [45].  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## BMJ Open

1  
2  
3 498 In practice and policy, there is a need for integrated care delivery models that leverage  
4  
5 499 community partnerships to help fill gaps in meeting the complex health and social needs of older  
6  
7 500 adults with diabetes. To advance Quintuple Aim outcomes [23], it is critical to assess patient  
8  
9 501 experiences with healthcare services as part of intervention research and practice to improve  
10  
11 502 health system performance.

12  
13  
14 503 The strengths of the study include its rigorous qualitative design and large sample size,  
15  
16 504 and the inclusion of diverse participants with regards to sex, marital status, and annual income,  
17  
18 505 from multiple sites across Canada. A limitation of the study was related to the sample as there  
19  
20 506 was a lack of cultural diversity and under-representation of older adults from marginalized  
21  
22 507 communities. A Diabetes Canada roundtable of key stakeholders recently emphasized the need  
23  
24 508 to implement community-based interventions [46], such as the ACHRU-CPP, to better support  
25  
26 509 older adults with diabetes and MCC living in marginalized communities. The need for  
27  
28 510 community-based interventions is based on the premise that racial and socioeconomic disparities  
29  
30 511 disproportionately affect marginalized older adults with diabetes and MCC and put them at an  
31  
32 512 increased risk for diabetes complications and mortality [47].

33  
34  
35  
36  
37  
38  
3940 514 **Conclusion**

41  
42 515 Overall, older adults with diabetes and MCC reported a positive experience and felt that  
43  
44 516 the ACHRU-CPP had a positive impact in supporting diabetes self-management. Study findings  
45  
46 517 reveal the need to ensure that older adults receive ongoing support and contact with a  
47  
48 518 collaborative team of primary care and community providers to better meet the complex needs  
49  
50 519 associated with daily self-management of diabetes and MCC. Results also shine light on the  
51  
52 520 broader social context that constitutes the life world of older adults and how chronic disease self-

## BMJ Open

521 management interventions need to address these contexts comprehensively through tailoring to  
522 individual circumstances. It is our hope that these findings will help usher in a new era of  
523 contextually informed person-centred care.

524

525 **Acknowledgements**

526 We thank the older adults and caregivers who participated in this study, as well as the  
527 nurses, dietitians, nutritionists and community program coordinators who provided the  
528 intervention. We also thank the managers of intervention teams, the recruiters, research  
529 assistants, and the study sites for their support of this study. Thanks to Robyn Connors for  
530 conducting interviews with study participants. We thank the research team in the Aging,  
531 Community and Health Research Unit (<https://achru.mcmaster.ca/>) for supporting this study. We  
532 would also like to thank the Community Advisory Board members, including people with lived  
533 experience with diabetes, who supported local implementation of the project in each province.

534 We acknowledge the following authors who are members of the **ACHRU-CPP**

535 **Research Team: Jenny Ploeg**, School of Nursing, Faculty of Health Sciences, McMaster  
536 University, Hamilton, Ontario, Canada; **Maureen Markle-Reid**, School of Nursing, Faculty of  
537 Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Ruta Valaitis**, School of  
538 Nursing, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada;  
539 **Kathryn Fisher**, School of Nursing, Aging, Community and Health Research Unit, Faculty of  
540 Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Rebecca Ganann**, School of  
541 Nursing, Aging, Community and Health Research Unit, Faculty of Health Sciences, McMaster  
542 University, Hamilton, Ontario, Canada; **Johanne Blais**, Department of Family Medicine and  
543 Emergency Medicine, Faculty of Medicine, Université Laval, Quebec City, Quebec; **Andrea**

BMJ Open

1  
2  
3 544 **Gruneir**, Department of Family Medicine Research Program, University of Alberta, Edmonton,  
4  
5 545 Alberta, Canada; **France Légaré**, VITAM-Centre de recherche en santé durable, Université  
6  
7 546 Laval, Quebec City, Quebec, Canada; **Janet MacIntyre**, Faculty of Nursing, University of  
8  
9 547 Prince Edward Island, Charlottetown, Prince Edward Island, Canada; **William Montelpare**,  
10  
11 548 Department of Applied Human Sciences, Faculty of Science, University of Prince Edward  
12  
13 549 Island, Prince Edward Island, Canada; **Jean-Sébastien Paquette**, Department of Family  
14  
15 550 Medicine and Emergency Medicine, Faculty of Medicine Université Laval, Québec, Canada;  
16  
17 551 **Marie-Eve Poitras**, Department of Family Medicine and Emergency Medicine, Faculty of  
18  
19 552 Medicine and Health Sciences, Université de Sherbrooke Chicoutimi, Quebec, Canada; **Angela**  
20  
21 553 **Riveroll**, Department of Applied Human Sciences, Faculty of Science, University of Prince  
22  
23 554 Edward Island, Charlottetown, Prince Edward Island, Canada, **Ali Ben Charif**, CubecXpert,  
24  
25 555 Quebec City, Quebec, Canada; **Dean Eurich**, School of Public Health, University of Alberta,  
26  
27 556 Edmonton, Alberta, Canada; **Amiram Gafni**, Department of Health Research Methods,  
28  
29 557 Evidence and Impact, Faculty of Health Sciences, McMaster University, Hamilton, Ontario,  
30  
31 558 Canada; **Gary Lewis**, Department of Medicine and Department of Physiology, University of  
32  
33 559 Toronto, Toronto, Ontario, Canada; **Lynne Mansell**, Patient/Public Research Partner, Alberta,  
34  
35 560 Canada; **Melissa Northwood**, School of Nursing, Aging, Community and Health Research Unit,  
36  
37 561 Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Janet Pritchard**,  
38  
39 562 Interdisciplinary Science and Kinesiology, Faculty of Science, McMaster University, Hamilton,  
40  
41 563 Ontario, Canada; **Cheryl Sadowski**, Faculty of Pharmacy and Pharmaceutical Sciences,  
42  
43 564 University of Alberta, Edmonton, Alberta, Canada; **Diana Sherifali**, School of Nursing, Faculty  
44  
45 565 of Health Sciences, McMaster University, Hamilton, Ontario, Canada; **Frank Tang**,  
46  
47 566 Patient/Public Research Partner, Ontario, Canada; **Lehana Thabane**, Department of Health  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## BMJ Open

1  
2  
3 567 Research Methods, Evidence and Impact, Faculty of Health Sciences, McMaster University,  
4  
5 568 Hamilton, Ontario, Canada; **Ross Upshur**, Bridgepoint Active Healthcare, Toronto, Ontario,  
6  
7 569 Canada; **Tyler Williamson**, Centre for Health Informatics, Cumming School of Medicine and  
8  
9 570 Department of Community Health Sciences, University of Calgary, Calgary, Alberta, Canada;  
10  
11 571 **Marie-Lee Yous**, School of Nursing, Faculty of Health Sciences, McMaster University,  
12  
13 572 Hamilton, Ontario, Canada.  
14  
15  
16  
17 573  
18

**Author Contributions**

19 574  
20  
21 575 Conceptualization: JP, MMR, RV, KF, RG, FL, WM.  
22  
23 576 Formal Analysis: MY, RG, TC, JP.  
24  
25 577 Funding Acquisition: JP, MMR, RV, KF, RG, AG, FL, JM, WM.  
26  
27 578 Investigation: JP, MMR, RV, KF, RG, TC, FL, WM, MY.  
28  
29 579 Methodology: JP, MMR, RV, KF, RG, MY, FL, WM.  
30  
31 580 Project Administration: JP, MMR, RV, TC, FL, WM.  
32  
33 581 Resources: JP, MMR, RV, FL, WM.  
34  
35 582 Supervision: JP, MMR, RV, RG, TC, FL, WM.  
36  
37 583 Validation: MY, JP, MMR, RV, KF, RG, TC, RC.  
38  
39 584 Writing – Original Draft: MY.  
40  
41 585 Writing – Review and Editing: MY, RG, TC, JP, MMR, RV, KF, FL, JM, WM. The authors read  
42  
43 586 and approved the final manuscript.  
44  
45  
46  
47  
48  
49 587  
50  
51 588

**Funding**

BMJ Open

1  
2  
3 589 This study is supported, in part, by funding from the Canadian Institutes of Health  
4  
5 590 Research Strategy for Patient-Oriented Research (SPOR) Primary and Integrated Health Care  
6  
7 591 Innovations Network: Programmatic Grants (Funding Reference Number: KPG-156883) in  
8  
9 592 partnership with: Diabetes Action Canada, a Canadian Institutes for Health Research (CIHR)  
10  
11 593 Strategy for Patient-Oriented Research Network in Chronic Disease (project reference  
12  
13 594 #1.1.1ACHR); McMaster Institute for Research on Aging (Hamilton, ON); McMaster University  
14  
15 595 School of Nursing; Réseau-1 Québec; Fonds de Recherche du Québec (FRQS); Scarborough  
16  
17 596 Health Network Foundation. This research was also undertaken, in part, thanks to the funding  
18  
19 597 from Dr. Markle-Reid's Tier 2 CIHR Canada Research Chair. The study was investigator-  
20  
21 598 initiated. The funders of this study had no role in study design, data collection, data analysis, data  
22  
23 599 interpretation or writing the manuscript.  
24  
25  
26  
27

28 600

### 31 601 **Competing Interests**

32  
33 602 None declared.  
34

35 603

### 38 604 **Availability of Data and Materials**

39  
40 605 The data for this research consists of questionnaires and interviews. Raw data such as  
41  
42 606 audio-files and interview transcripts cannot be publicly released due to the risk of compromising  
43  
44 607 participant confidentiality related to identification of voices and publicly exposing personal  
45  
46 608 information.  
47  
48

49 609

### 52 610 **Ethics Statement**

## BMJ Open

1  
2  
3 611 Institutional ethics approval was obtained from the following: the Hamilton Integrated  
4  
5 612 Research Ethics Board (#5101); the Scarborough Health Network Research Ethics Board (#NEP-  
6  
7 613 18-014); the Unity Health Toronto Research Ethics Board (#18-336); University of Prince  
8  
9 614 Edward Island Research Ethics Board (#6008019); Prince Edward Island Research Ethics Board  
10  
11 615 (#6008019); and Centre intégré universitaire de santé et de services sociaux (CIUSSS) de la  
12  
13 616 Capitale-Nationale (MP-13-2019-1670). Trained research assistants obtained informed consent  
14  
15 617 from all older adult participants prior to their participation in the study, and all participants  
16  
17 618 received a copy of their consent form, in person or by mail. All participants gave permission to  
18  
19 619 audio-record their interview. All participant information was kept confidential in a secure  
20  
21 620 location (e.g., locked cabinet in a secured office, password-protected encrypted electronic  
22  
23 621 folders), and data were de-identified using unique study IDs. Participants who completed a  
24  
25 622 qualitative interview received a \$25.00 gift card as an honorarium.  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

623

624

## References

- [1] World Health Organization. Diabetes. Available from: <https://www.who.int/en/news-room/fact-sheets/detail/diabetes>. 2022. Accessed 3 Jan 2022.
- [2] Kirkman MS, Briscoe VJ, Clark N, et al. Diabetes in older adults: A consensus report. *J Am Geriatr Soc* 2012;35(12):2650-64.
- [3] Dhaliwal R, Weinstock RS. Management of type 1 diabetes in older adults. *Diabetes Spectr*. 2014;27(1):9-20.
- [4] Sinnige J, Braspenning J, Schellevis F, et al. The prevalence of disease clusters in older adults with multiple chronic diseases—a systematic literature review. *PloS one* 2013;8(11):e79641.
- [5] Lin PJ, Kent DM, Winn A, et al. Multiple chronic conditions in type 2 diabetes mellitus: prevalence and consequences. *Am J Manag Care* 2015;21(1):e23-34.
- [6] Fisher K, Griffith L, Gruneir A, et al. Comorbidity and its relationship with health service use and cost in community-living older adults with diabetes: A population-based study in Ontario, Canada. *Diabetes Res Clin Pract* 2016;122:113-123.
- [7] Willi C, Bodenmann P, Ghali WA, et al. Active smoking and the risk of type 2 diabetes: A systematic review and meta-analysis. *JAMA* 2007; 298:2654-64.
- [8] Ploeg J, Matthew-Maich N, Fraser K, et al. Managing multiple chronic conditions in the community: A Canadian qualitative study of the experiences of older adults, family caregivers and healthcare providers. *BMC Geriatr* 2017;17.
- [9] The Change Foundation. Family caregiver assessment in health care settings, summary of the change foundation's literature review and environment scan project. Toronto, August 2016.
- [10] McGilton KS, Vellani S, Yeung L, et al. Identifying and understanding the health and social care needs of older adults with multiple chronic conditions and their caregivers: A scoping review. *BMC Geriatr* 2018;18(1):1-33.
- [11] Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ*. 2008;337:1-6.
- [12] Whitemore R. A systematic review of the translational research on the diabetes prevention program. *Transl Behav Med* 2011;1:480-91.
- [13] Tuomilehto J, Schwarz P, Lindström J. Long-term benefits from lifestyle interventions for type 2 diabetes prevention: Time to expand the efforts. *Diabetes Care* 2011;34:S210-14.
- [14] Smith SM, Wallace E, O'Dowd T, et al. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database Syst Rev* 2016;3.
- [15] Yoon U, Kwok LL, Magkidis A. Efficacy of lifestyle interventions in reducing diabetes incidence in patients with impaired glucose tolerance: A systematic review of randomized controlled trials. *Metabolism* 2013;62:303-14.
- [16] Busetto L, Luijkx KG, Elissen AMJ, et al. Context, mechanisms and outcomes of integrated care for diabetes mellitus type 2: A systematic review. *BMC Health Serv Res* 2016;16:1-14.
- [17] Diabetes Prevention Program Research Group. 10-year follow-up of diabetes incidence and weight loss in the diabetes prevention program outcomes study. *Lancet* 2009;374:1677-86.



## BMJ Open

- 1  
2  
3 665 [18] Wong KC, Wong FKY, Yeung W, et al. The effect of complex interventions on supporting  
4 666 self-care among community-dwelling older adults: A systematic review and meta-analysis. *Age*  
5 667 *Ageing* 2017;1-9.
- 6 668 [19] Azami G, Soh KL, Sazlina SG, et al. Effect of a nurse-led diabetes self-management  
7 669 education program on glycosylated hemoglobin among adults with type 2 diabetes. *J Diabetes*  
8 670 *Res* 2018:1-13.
- 9 671 [20] Chow SK, Wong FK. A randomized controlled trial of a nurse-led case management  
10 672 programme for hospital-discharged older adults with co-morbidities. *J Adv Nurs*  
11 673 2014;70(10):2257-71.
- 12 674 [21] Dahal PK, Hosseinzadeh H. Association of health literacy and diabetes self-management: A  
13 675 systematic review. *Aust J Prim Health* 2020;25(6):526-33.
- 14 676 [22] Ferris R, Blaum C, Kiwak E, et al. Perspectives of patients, clinicians, and health system  
15 677 leaders on changes needed to improve the health care and outcomes of older adults with multiple  
16 678 chronic conditions. *J Aging Health* 2018;30(5):778-99.
- 17 679 [23] Nundy S, Cooper LA, Mate KS. The Quintuple Aim for health care improvement: A new  
18 680 imperative to advance health equity. *JAMA* 2022;327(6):521–522.
- 19 681 [24] Markle-Reid M, Ploeg J, Fisher K, et al. The Aging, Community and Health Research  
20 682 Unit—Community Partnership Program for older adults with type 2 diabetes and multiple  
21 683 chronic conditions: A feasibility study. *Pilot Feasibility Stud* 2016 2(1):24.
- 22 684 [25] Markle-Reid M, Ploeg J, Fraser KD, et al. Community program improves quality of life and  
23 685 self-management in older adults with diabetes mellitus and comorbidity. *J Am Geriatr Soc*. 2018  
24 686 Feb;66(2):263-73.
- 25 687 [26] Miklavcic JJ, Fraser KD, Ploeg J, Markle-Reid M, Fisher K, Gafni A, Griffith LE, Hirst S,  
26 688 Sadowski CA, Thabane L, Triscott JA. Effectiveness of a community program for older adults  
27 689 with type 2 diabetes and multimorbidity: A pragmatic randomized controlled trial. *BMC Geriatr*.  
28 690 2020 Dec;20(1):1-14.
- 29 691 [27] Fisher K, Markle-Reid M, Ploeg J, Bartholomew A, Griffith LE, Gafni A, Thabane L, Yous  
30 692 ML. Self-management program versus usual care for community-dwelling older adults with  
31 693 multimorbidity: A pragmatic randomized controlled trial in Ontario, Canada. *J Comorb*. 2020  
32 694 Oct 14;20(174):1-14.
- 33 695 [28] Ploeg J, Markle-Reid M, Valaitis R, et al. The Aging, Community and Health Research Unit  
34 696 Community Partnership Program for older adults with diabetes and multiple chronic conditions:  
35 697 Study protocol for a randomized controlled trial. *BMC Geriatrics* 2022;22(99):1-22.
- 36 698 [29] Sandelowski M. Whatever happened to qualitative description? *Res Nurs health*.  
37 699 2000;23(4):334-40.
- 38 700 [30] Sandelowski M. What's in a name? Qualitative description revisited. *Res Nurs Health*. 2010  
39 701 Feb;33(1):77-84.
- 40 702 [31] Patton MQ. *Qualitative evaluation and research methods*. Beverly Hills, CA: SAGE, 1990.
- 41 703 [32] Braun V, Clarke V. *Successful qualitative research: A practical guide for beginners*.  
42 704 London, England: SAGE, 2013.
- 43 705 [33] Damschroder LJ, Aron DC, Keith RE, et al. Fostering implementation of health services  
44 706 research findings into practice: A consolidated framework for advancing implementation  
45 707 science. *Implement Sci*. 2009 Dec;4(1):1-5.
- 46 708 [34] QSR International Pty Ltd. NVivo (Version 12). 2018. Available from:  
47 709 <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>
- 48 710 [35] Lincoln YS, Guba EG. *Naturalistic inquiry*. Sage Publications, 1985.

## BMJ Open

- 1  
2  
3 711 [36] Sayyed Kassem L, Aron DC. The assessment and management of quality of life of older  
4 712 adults with diabetes mellitus. *Expert Rev Endocrinol Metab*. 2020 Mar 3;15(2):71-81.  
5 713 [37] Skinner TC, Joensen L, Parkin T. Twenty-five years of diabetes distress research. *Diab*  
6 714 *Med*. 2020 Mar;37(3):393-400.  
7 715 [38] Robinson DJ, Coons M, Haensel H, et al. Diabetes and mental health. *Can J Diabetes* 2018  
8 716 Apr 1;42:S130-41.  
9 717 [39] Lynch CP, Gebregziabher M, Zhao Y, et al. Impact of medical and psychiatric multi-  
10 718 morbidity on mortality in diabetes: emerging evidence. *BMC Endocr Disord* 2014;14(1):1-8.  
11 719 [40] Kuluski K, Guilcher SJ. Toward a person-centred learning health system: Understanding  
12 720 value from the perspectives of patients and caregivers. *Healthc Pap* 2019;18(4):36-46.  
13 721 [41] Hellquist K, Bradley R, Grambart S, et al. Collaborative practice benefits patients: An  
14 722 examination of interprofessional approaches to diabetes care. *Health Interprofessional Pract*  
15 723 2012;1(eP1017).  
16 724 [42] O'Connor PJ, Desai J, Solberg LI, et al. Randomized trial of quality improvement  
17 725 intervention to improve diabetes care in primary care settings. *Diabetes Care* 2005;28,1890-97.  
18 726 [43] Valaitis RK, Wong ST, MacDonald M, et al. Addressing quadruple aims through primary  
19 727 care and public health collaboration: ten Canadian case studies. *BMC Public Health*  
20 728 2020;20(1):1-6.  
21 729 [44] Agency for Healthcare Research and Quality. About learning health systems. 2019.  
22 730 Available from: <https://www.ahrq.gov/learning-health-systems/about.html>. Accessed 12 Feb  
23 731 2022.  
24 732 [45] Rapid Improvement Support and Exchange. RISE brief 1. OHT (Ontario Health Team)  
25 733 building blocks. 2019. Available from: [https://www.mcmasterforum.org/docs/default-](https://www.mcmasterforum.org/docs/default-source/rise-docs/rise-briefs/rb1_oht-building-blocks.pdf?sfvrsn=71b154d5_27)  
26 734 [source/rise-docs/rise-briefs/rb1\\_oht-building-blocks.pdf?sfvrsn=71b154d5\\_27](https://www.mcmasterforum.org/docs/default-source/rise-docs/rise-briefs/rb1_oht-building-blocks.pdf?sfvrsn=71b154d5_27). Accessed 12 Feb  
27 735 2022.  
28 736 [46] Diabetes Canada. Summary of Diabetes Canada Diabetes 360° Ontario roundtable. 2019.  
29 737 Available from: [https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-](https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy_Roundtable-Summary_FINAL.pdf)  
30 738 [Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy\\_Roundtable-](https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy_Roundtable-Summary_FINAL.pdf)  
31 739 [Summary\\_FINAL.pdf](https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-Policy/Advocacy%20Reports/Ontario-Diabetes-360-Strategy_Roundtable-Summary_FINAL.pdf). Accessed 12 Feb 2022.  
32 740 [47] Clements JM, West BT, Yaker Z, et al. Disparities in diabetes-related multiple chronic  
33 741 conditions and mortality: The influence of race. *Diabetes Res Clin Pract* 2020;159(107984):1-  
34 742 19.  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## COREQ (CONsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
<b>Domain 1: Research team and reflexivity</b>			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	
Occupation	3	What was their occupation at the time of the study?	
Gender	4	Was the researcher male or female?	
Experience and training	5	What experience or training did the researcher have?	
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	
<b>Domain 2: Study design</b>			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	
Sample size	12	How many participants were in the study?	
Non-participation	13	How many people refused to participate or dropped out? Reasons?	
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	
<i>Data collection</i>			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	
Repeat interviews	18	Were repeat interviews carried out? If yes, how many?	
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	
Field notes	20	Were field notes made during and/or after the interview or focus group?	
Duration	21	What was the duration of the interviews or focus group?	
Data saturation	22	Was data saturation discussed?	
Transcripts returned	23	Were transcripts returned to participants for comment and/or	

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
<b>Domain 3: analysis and findings</b>			
<i>Data analysis</i>			
Number of data coders	24	How many data coders coded the data?	
Description of the coding tree	25	Did authors provide a description of the coding tree?	
Derivation of themes	26	Were themes identified in advance or derived from the data?	
Software	27	What software, if applicable, was used to manage the data?	
Participant checking	28	Did participants provide feedback on the findings?	
<i>Reporting</i>			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	
Data and findings consistent	30	Was there consistency between the data presented and the findings?	
Clarity of major themes	31	Were major themes clearly presented in the findings?	
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

**Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.**