

1 **Title:**

2 Attendance, activation and health profiles of participants in a regional chronic
3 disease self-management program in Laval, Canada

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28

29 **Abstract**

30 **Background:** Chronic diseases are responsible for over 70% of all deaths
31 globally. While some self-management programs have been shown to be
32 efficacious in preventing or altering trajectories for some chronic conditions,
33 scaling-up and sustaining such programs beyond tightly-controlled study
34 conditions remain a major challenge. The objective of the current study was to
35 describe the profile of attendees and the level of engagement of participants in a
36 new, region-wide cardiometabolic disease self-management program offered in
37 Laval, Canada. **Methods:** CISSS-Laval partnered with the Cardiovascular Health
38 Awareness Program team to co-develop Cible-santé and evaluate the first cohort
39 of participants enrolled in the program, in order to better understand the
40 program's implementation and scope. Trained volunteers (supervised by a nurse)
41 assisted participants with physical measurements (blood pressure, height, weight
42 and waist circumference), a questionnaire on healthy habits, and assessment of
43 cardiovascular disease and type 2 diabetes risk. **Results:** The evaluation of the
44 first cohort of Cible-Santé participants showed very low attendance. Furthermore,
45 only 1 in 10 of enrolled participants completed the full program. The program
46 typically attracted adults with some risk factors associated with their chronic
47 conditions (high waist circumference, obesity), but with an already high level of
48 knowledge, skills and confidence to participate in self-management activities.
49 **Conclusion:** A limitation of the study is the lack of data regarding the number of
50 professionals who referred their patients to the program. This study provides a
51 portrait of new participants to a self-management chronic disease program,

52 which highlights the potential of supporting chronic disease patients ready to
53 make changes but also exposes the difficulty of attracting a larger number and
54 diversity of participants and in encouraging completion of the program.

55

56

57 **Keywords:**

58 Chronic disease

59 Self-management programs

60 Health promotion

61 Volunteers

62 Health profile

63 Patient Activation Measure

64

65

66 **Background:**

67 Chronic diseases — including cardiovascular diseases, cancers, chronic
68 respiratory diseases and diabetes — are responsible for over 70% of all deaths
69 globally. Modifiable risk factors that include smoking, physical inactivity and
70 unhealthy diets are the main drivers behind the growing epidemic of chronic
71 diseases [1]. While some health promotion and self-management programs have

72 been shown to be efficacious in preventing or altering trajectories for some
73 chronic conditions, in modifying risk profiles and in improving satisfaction and
74 knowledge of participants [2], scaling-up and sustaining such programs beyond
75 tightly-controlled study conditions remain a major challenge.

76

77 Participation rates in health promotion and chronic disease self-management
78 programs are generally low [3], despite their wide availability in most high-income
79 countries, often not requiring referrals from a health professional and offered free
80 of charge or at low cost [4]. People who engage in health promotion or self-
81 management programs are more likely to be female [5], younger [4, 6, 7], more
82 educated [6, 8], of higher socioeconomic status [9], Caucasian [5], in better
83 physical health [3, 6, 7] and to already be adhering to healthier lifestyles [10].
84 They are also more likely to have a better understanding of their condition than
85 patients who do not participate [6].

86

87 Program type and program location also influence attendance. The participation
88 rates are higher when programs are offered in a variety of time and place
89 settings, when there is no need for referral and when participation is free or low
90 cost [5]. Elzen and colleagues showed that living far away from a program's
91 location and transportation constraints both represented barriers to participation
92 [10]. Another study found that living in rural areas with limited access to

93 physicians increased utilization of a diabetes self-management education
94 program [4].

95

96 The objective of the current study was to describe the profile of attendees and
97 the level of engagement of participants in a new, region-wide cardiometabolic
98 disease self-management program offered in Laval, Canada. The study took
99 place in 2015 and looked at the first cohort of Cible-Santé participants.

100

101 **Program description**

102 The Cible-Santé program was developed by the regional health authority, Centre
103 intégré de santé et des services sociaux de Laval (CISSS-Laval) servicing over
104 400,000 residents of Laval, the second largest city in the province of Québec,
105 Canada. The goal of the program was to help participants modify some of their
106 unhealthy habits in order to support the self-management of their cardiometabolic
107 diseases. The program was led by an interdisciplinary team (nutritionists,
108 kinesiologists and nurses) trained in motivational interviewing techniques [11,
109 12]. The SMART¹ objectives developed by participants were at the heart of the
110 change process. The 8-month program included three group workshops and five
111 individual follow-ups.

112

¹ SMART= Specific, Measurable, Attainable, Relevant and Time-Bound.

113 CISSS-Laval partnered with the Cardiovascular Health Awareness Program team
114 to co-develop Cible-santé and evaluate the first cohort of participants enrolled in
115 the program, in order to better understand the program's implementation and
116 scope. These findings might offer useful insights that can inform similar future
117 programs.

118

119 CHAP is a patient-centred, interdisciplinary, multi-faceted, community-led,
120 cardiovascular disease prevention and management program targeting older
121 Canadian adults. Building on 20 years of work around CHAP [13-22], the
122 evaluation consisted of physical measurements that included blood pressure,
123 height, weight and waist circumference, a questionnaire on healthy habits, and
124 assessment of cardiovascular disease and type 2 diabetes risk at the onset of
125 the first Cible-Santé group session. The CHAP sessions were run by locally
126 recruited and trained volunteers and supervised by public-health nurses.

127

128 **Method**

129 *Design:*

130 This was a prospective, open-cohort study with no comparison group. Our goal
131 was to describe the attendance, health profile and level of activation of new
132 participants in the Cible-Santé cardiometabolic diseases self-management
133 program.

134

135 *Recruitment of participants:*

136 To be eligible for Cible-Santé program, patients had to be registered with one of
137 Laval's interdisciplinary primary care clinics (*Groupe de médecine de famille* or
138 GMF) and had to have at least one of the following chronic conditions: type 2
139 diabetes, pre-diabetes, hypertension, pre-hypertension, cardiovascular disease,
140 dyslipidemia, stroke/transient ischemic attack, heart failure, kidney failure,
141 metabolic syndrome or peripheral vascular disease. Participants had to be
142 identified and referred to the program by their primary care health professional
143 practicing in one of the city's interdisciplinary primary care clinics. Referrals were
144 sent to CISSS-Laval appointment centre, who subsequently contacted potential
145 participants to enroll them into the program.

146

147 Cible-Santé participants were invited to attend three group-based workshops and
148 five individual follow-up sessions with a nutritionist, kinesiologist or nurse over an
149 eight-month period. At their first group workshop, patients were invited to
150 participate in a CHAP evaluation session. After signing a consent form, CHAP
151 volunteers, supervised by a Cible-Santé program nurse, had their blood
152 pressure, waist circumference and body mass index measured, completed a
153 questionnaire on health habits, level of activation and the risk of developing
154 prediabetes and type 2 diabetes over the next 10 years.

155

156 *Measures:*

157 Data on demographic characteristics, health status, risk factors and patient
158 activation were collected at baseline and were self-reported by participants.

159

160 For physical activity, patients were asked to list the type and number of minutes
161 of physical activities for a typical week. Then, categories were created from a
162 measure of intensity in Metabolic Equivalents (METs) multiplied by the duration
163 of exercise. The equivalence in minutes of slow walking per day was used as a
164 guide.

165

166 The Patient Activation Measure (PAM) assesses the knowledge, skills and
167 confidence for self-management. [23]. Four levels of activation were categorized
168 according to the score ranging from 0 to 100. At Stage 1, the person is
169 considered "unaware", does not feel confident enough and is a passive recipient
170 of care. At Stage 2, the person lacks confidence and understanding of their
171 health care (e.g., how to take or know what their medications do). At Stage 3, the
172 person knows the essential facts and begins to take steps to take care of their
173 health, but may lack the confidence and skills to take complete control of their
174 health care. At Stage 4, knowledge, skills and confidence for self-management
175 are all present.

176

177 All respondents who reported not being diagnosed with type 2 diabetes or being
178 unsure were asked to complete the Canadian Diabetes Risk Questionnaire
179 (CANRISK). Developed by the Public Health Agency of Canada, this
180 questionnaire-based tool assesses the risk of developing pre-diabetes and type 2
181 diabetes in the next 10 years [24].

182

183 During the sessions, physical measurements were taken by trained volunteers
184 and included waist circumference, weight and height (to calculate the body mass
185 index), as well as participant blood pressure, using an automated measuring
186 device, the Microlife WatchBP Office Afib, which allows dual-cuff measurement
187 and atrial fibrillation detection. The participants with elevated blood pressure
188 (>140/90 mm Hg) were assessed by the nurse and referred to their family
189 physician for follow-up.

190

191 Program participation was defined as completing all three group-based
192 workshops and five individual follow-ups. Program completion rate was
193 calculated using the total number of participants who registered as the
194 denominator.

195

196 *Analyses*

197 Data were analyzed with SPSS, version 24.0. Univariate descriptive statistics
198 and frequency distributions were used to summarize the data.

199

200 **Results:**

201

202 [INSERT FIGURE 1 HERE]

203

204 The total number of patients referred by health professionals practicing in one of
205 the GMFs in Laval has not been recorded. A total of 270 patients had registered
206 with the Cible-Santé program. Of these, 190 attended at least one group-based
207 workshop and 141 took part in the CHAP evaluation session that preceded the
208 first group workshop. One in ten (10.4%, 28/270) of the enrolled participants had
209 attended all three group workshops and five individual follow-ups.

210

211 [INSERT TABLE 1 HERE]

212

213 More than half of the participants were 55 years of age or older, and the majority
214 were female (Table 1).

215

216 [INSERT TABLE 2 HERE]

217

218 The vast majority of participants (83.1%, 113/136) had a waist circumference of
219 more than 88 cm for women and more than 102 cm for men, and nearly 70%
220 (97/140) were classified as obese. Over 17% had a diagnosis of hypertension
221 (not shown in table) and more than a third had blood pressure above >140/ 90
222 mm Hg).

223

224 [INSERT TABLE 3 HERE]

225

226 Approximately half of participants reported to eating the recommended daily
227 servings of fruits and vegetables (four to six servings), and a similar proportion
228 reported little to no physical activity (16.8% and 32.1%) (Table 3). Nearly half of
229 the participants were classified at a level 4 of activation (Table 4).

230

231 [INSERT TABLE 4 HERE]

232

233 Of all 141 participants who had participated in a CHAP evaluation session, 68
234 (48.2%) reported being diabetic (Table 5). Those who had no diagnosis or who
235 were unsure (n=73) completed the CANRISK. More than 60% were classified as
236 having high or very high risk of developing pre-diabetes or diabetes.

237

238

[INSERT TABLE 5 HERE]

239

240 **Discussion:**

241 The evaluation of the first cohort of Cible-Santé participants showed very low
242 attendance (270 adults who registered from over 200,000 patients² registered in
243 all of Laval's GMFs). Furthermore, only 1 in 10 of enrolled participants completed
244 the full program. While the total number of patients referred to the program was
245 not recorded, given the prevalence of targeted conditions and risk factors in
246 primary care, the number of patients who registered and completed the program
247 was quite low. These results, while below expectations, are consistent with what
248 has been reported in the literature. Although the program was offered free of
249 charge by the local health authorities and in settings familiar to participants, there
250 are likely several explanations for the low attendance and completion rates.

251

252 First, Cible-Santé was a new program introduced in the already large spectrum of
253 services provided by the regional health authority. Moreover, no specific
254 communication strategy was put forth to inform referring health professionals of
255 this innovative program made available to their chronic disease patients. Many
256 community health providers were thus probably unaware of the program or
257 uncertain of its value to their patients, which might have limited referrals. Given
258 that this was the first cohort of participants, a more comprehensive

² This is an estimation of the number of patients registered in one of Laval's GMFs at the time of data collection. We don't know the total number of patients who met the eligibility criteria of Cible-Santé.

259 communication strategy targeting health professionals in the region might help
260 raise awareness about the program and its goals. Second, the evidence
261 suggests that when programs are offered in a variety of time and place settings,
262 participation rates are typically higher [5]. Cible-Santé was, at the time, offered to
263 one new cohort per month and this study focused only on the first cohort. Third,
264 the low completion rate could be explained by the long duration of the program (8
265 months) and low frequency of interactions with health professionals (one group
266 workshop or individual follow-up per month), which may have de-motivated some
267 participants. Finally, limited public transportation and the need to pay for parking
268 may have limited access to the program for some of the participants.

269

270 The profile of Cible-Santé participants suggests that they tend to engage in a
271 relatively healthy lifestyle. It is difficult to establish to what extent these self-
272 reported “healthy habits” represent a true reflection of reality in contrast to a
273 response bias resulting from the pressure they may have felt to provide socially
274 acceptable answers. Over 80% of participants had waist circumference that put
275 them at high risk for cardiovascular disease and 69% had a BMI of 30 or over
276 (obese to morbid obese), two risk factors associated with the development of
277 health problems such as diabetes, heart disease and hypertension. The CHAP
278 sessions contributed objective physical measures data as well as validated data
279 on level of risk of developing cardiovascular disease, prediabetes or diabetes
280 found in the Cible santé program participants. These results tend to confirm the

281 appropriateness of the healthcare provider referrals to this chronic disease self-
282 management program.

283

284 Nearly half of participants were considered highly activated (stage 4 of the PAM).

285 Given that people self-select to participate in the Cible-Santé program (with
286 referral from a health professional), high levels of activation are not surprising.

287 Their participation in the program is probably the result of their high level of
288 knowledge, skills and confidence.

289

290 A limitation of the study is the lack of data regarding the number of professionals
291 who referred their patients to the program. This study was conducted in a real
292 care setting and in collaboration with managers responsible for the program,
293 which explains the absence of certain data (missing denominator). This would
294 have allowed us to know the proportion of referred patients who subsequently
295 enrolled in the program, and thus know the number of patients who follow-up on
296 such referrals from their health care provider.

297

298 Another limitation of this study is the lack of a control group. Having a
299 comparison group with similar baseline characteristics, that would not have
300 participated in this chronic disease self-management program or maybe enrolled
301 in a different program, would have enabled us to better assess the characteristics
302 associated with recruitment and participation.

303

304 **Conclusion:**

305 The evaluation by the CHAP team made it possible to draw a health profile of the
306 first cohort of Cible-Santé participants. CHAP volunteers were trained to
307 adequately measure blood pressure, body mass index and waist circumference,
308 and to assist participants in completing their questionnaires. The results showed
309 a very low attendance and completion rate. The program typically attracted
310 adults with some risk factors associated with their chronic conditions (high waist
311 circumference, obesity), but with an already high level of knowledge, skills and
312 confidence to participate in self-management activities.

313

314 This study provides a portrait of new participants to a self-management chronic
315 disease program, which highlights the potential of supporting chronic disease
316 patients ready to make changes but also exposes the difficulty of attracting a
317 larger number and diversity of participants and in encouraging completion of the
318 program. Further studies are needed to assess the effect of the program on self-
319 management skills and health outcomes of participants, test several recruitment
320 strategies to increase the diversity of the target population and to compare
321 participants' health profiles with non-participants.

322

323

324 **List of abbreviations:**

- 325 BMI: Body Mass Index
- 326 CANRISK: Canadian Diabetes Risk Questionnaire
- 327 CHAP: Cardiovascular Health Awareness Program
- 328 CISSS-Laval: Centre intégré de santé et services sociaux de Laval
- 329 GMF: *Groupe de médecine de famille* (Interdisciplinary primary care clinics)
- 330 METS: Metabolic Equivalents
- 331 PAM: Patient Activation Measure
- 332 SMART: Specific, Measurable, Attainable, Relevant, and Time-Bound

333

334

335 **Declarations**

336 *Ethics approval and consent to participate*

337 The study protocol was reviewed and approved by the scientific and research ethics
338 committee of the Laval regional health authority (Centre intégré de santé et de services
339 sociaux de Laval). Participants and volunteers provided written consent to participate.

340

341 *Consent for publication*

342 Not applicable.

343

344 *Availability of data and materials*

345 The datasets used and/or analysed during the current study are available from the
346 corresponding author (MG) on reasonable request.

347

348 *Competing interests*

349 The authors declare that they have no competing interests.

350

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354 publish, or preparation of the manuscript.

355

356 *Authors' contributions*

357 MG, JK and MTL conceptualized the study protocol and its implementation. MG and VM
358 carried out analyses. MG drafted the initial manuscript, and reviewed and revised the
359 manuscript. All authors assisted with data interpretation and synthesis and reviewed and
360 revised the manuscript. MG, JK, MTL and VM read and approved the final manuscript as
361 submitted and agreed to be accountable for all aspects of the work.

362

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367 the sessions.

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370 **References**

- 371 1. World Health Organisation. Noncommunicable diseases country profiles
372 2018. Geneva: World Health Organization; 2018. Licence: CC BY-NC-SA
373 3.0 IGO
374
- 375 2. Reynolds R, Dennis S, Hasan I, Slewa J, Chen W, Tian D, et al. A
376 systematic review of chronic disease management interventions in primary
377 care. *BMC Fam Pract.* 2018; doi: 10.1186/s12875-017-0692-3.
378
- 379 3. Dattalo M, Giovannetti ER, Scharfstein D, Boult C, Wegener S, Wolff JL, et
380 al. Who Participates in Chronic Disease Self-Management (CDSM)
381 Programs? Differences between Participants and Non Participants in a
382 Population of Multi-Morbid Older Adults. *Med Care.* 2012;
383 doi:10.1097/MLR.0b013e318268abe7.
384
- 385 4. Cauch-Dudek, K, Victor, JC, Sigmond, M, Shah BR. Disparities in
386 attendance at diabetes self-management education programs after
387 diagnosis in Ontario, Canada: a cohort study. *BMC Public Health.* 2013;
388 doi.org/10.1186/1471-2458-13-85.

389

390 5. Bruce B, Lorig K, Laurent D. Participation in patient self-management
391 programs. *Arthritis Rheum.* 2007;57:851–4.

392

393 6. Muntner P, Sudre P, Uldry C, Rochat T, Courteheuse C, Naef AF, et al.
394 Predictors of participation and attendance in a new asthma patient self-
395 management education program. 2001; 120:778-84.

396

397 7. Jong ZD, Munneke M, Jansen LM, Runday K, van Schaardenburg DJ,
398 Brand R. Differences between participants and nonparticipants in an
399 exercise trial for adults with rheumatoid arthritis. *Arthritis Care &*
400 *Research.* 2004;51:593–600.

401

402 8. Santorelli ML, Ekanayake RM, Wilkerson-Leconte L. Participation in a
403 Diabetes Self-Management Class Among Adults With Diabetes, New
404 Jersey 2013-2015. *Prev Chronic Dis.* 2017; doi: 10.5888/pcd14.170023.

405

406 9. Hardman R, Begg S, Spelten E. What impact do chronic disease self-
407 management support interventions have on health inequity gaps related to
408 socioeconomic status: a systematic review. *BMC Health Serv Res.* 2020;
409 doi: 10.1186/s12913-020-5010-4.

410

- 411 10. Elzen H1, Slaets JP, Snijders TA, Steverink N. Do older patients who refuse
412 to participate in a self-management intervention in the Netherlands differ
413 from older patients who agree to participate? *Aging Clinical and*
414 *Experimental Research*. 2008;20:266–271.
- 415
- 416 11. Miller WR, Rollnick S. *Motivational Interviewing. Preparing people for*
417 *change*. 2nd ed. New York: The Guilford Press, 2002.
- 418
- 419 12. Prochaska J, DiClemente C. Towards a comprehensive model of change.
420 In: Miller WR, Heather N, editors. *Treating addictive behaviours: processes*
421 *of change*. New York: Pergamon, 1986.
- 422
- 423 13. Karwalajtys T, McDonough B, Hall H, Guirguis-Younger M, Chambers
424 LW, Kaczorowski J, et al. Development of the volunteer peer educator role
425 in a community Cardiovascular Health Awareness Program (CHAP): a
426 process evaluation in two communities. *J Community Health* 2009; 34: 336-
427 45.
- 428
- 429 14. Chambers LW, Kaczorowski J, Dolovich L, Karwalajtys T, Hall HL,
430 McDonough B, et al. A community-based program for cardiovascular health
431 awareness. *Can J Public Health* 2005; 96: 294-8.
- 432

- 433 15. Jones C, Simpson SH, Mitchell D, Haggarty S, Campbell N, Then K, et al.
434 Enhancing hypertension awareness and management in the elderly:
435 lessons learned from the Airdrie Community Hypertension Awareness and
436 Management Program (A-CHAMP). *Can J Cardiol* 2008; 24: 561-7.
437
- 438 16. Carter, M, Karwalajtys, T, Chambers, L, Kaczorowski, J, Dolovich, L,
439 Gierman, T, et al. Implementing a standardized community-based
440 cardiovascular risk assessment program in 20 Ontario communities. *Health
441 Promot Int* 2009; 24: 325-33.
442
- 443 17. Pora VV, Farrell B, Dolovich L, Kaczorowski, J, Chambers, L. Promoting
444 cardiovascular health among older adults: A pilot study with community
445 pharmacists. *Canadian Pharmacy Journal* 2005;138:50-55.
446
- 447 18. Karwalajtys T, Kaczorowski J, Chambers L, Levitt C, Dolovich L,
448 McDonough B, et al. A randomized trial of mail vs. telephone invitation to a
449 community-based cardiovascular health awareness program for older family
450 practice patients. *BMC Family Practice* 2005, 6:35.
451
- 452 19. Kaczorowski J, Chambers L, Karwalajtys T, Dolovich L, Farrell B,
453 McDonough B, et al. Cardiovascular Health Awareness Program (CHAP): a
454 community cluster-randomised trial among elderly Canadians. *Prev Med*
455 2008; 46: 537-44.

456

457 20. Kaczorowski J, Chambers LW, Dolovich L, Paterson JM, Karwalajtys T,
458 Gierman T, et al. Improving cardiovascular health at the population level: A
459 39 community cluster-randomized trial of the Cardiovascular Health
460 Awareness Program (CHAP). *BMJ* 2011;342:d442.

461

462 21. Goeree R, von Keyserlingk C, Burke N, He J, Kaczorowski J, Chambers L,
463 et al. Economic appraisal of a community-wide cardiovascular health
464 awareness program. *Value Health J Int Soc Pharmacoeconomics*
465 *Outcomes Res.* 2013; doi:10.1016/j.jval.2012.09.002.

466

467 22. Chambers LW, Kaczorowski J, O’Rielly S, Ignagni S, Hearps SJC.
468 Comparison of blood pressure measurements using an automated blood
469 pressure device in community pharmacies and family physicians’ offices: a
470 randomized controlled trial. *Can Med Assoc Open Access J.* 2013;
471 doi:10.9778/cmajo.20130005.

472

473 23. Hibbard JH, Stockard J, Mahoney ER, Tusler M. Development of the
474 Patient Activation Measure (PAM): Conceptualizing and Measuring
475 Activation in Patients and Consumers. *Health Serv Res.* 2004; doi:
476 10.1111/j.1475-6773.2004.00269.x

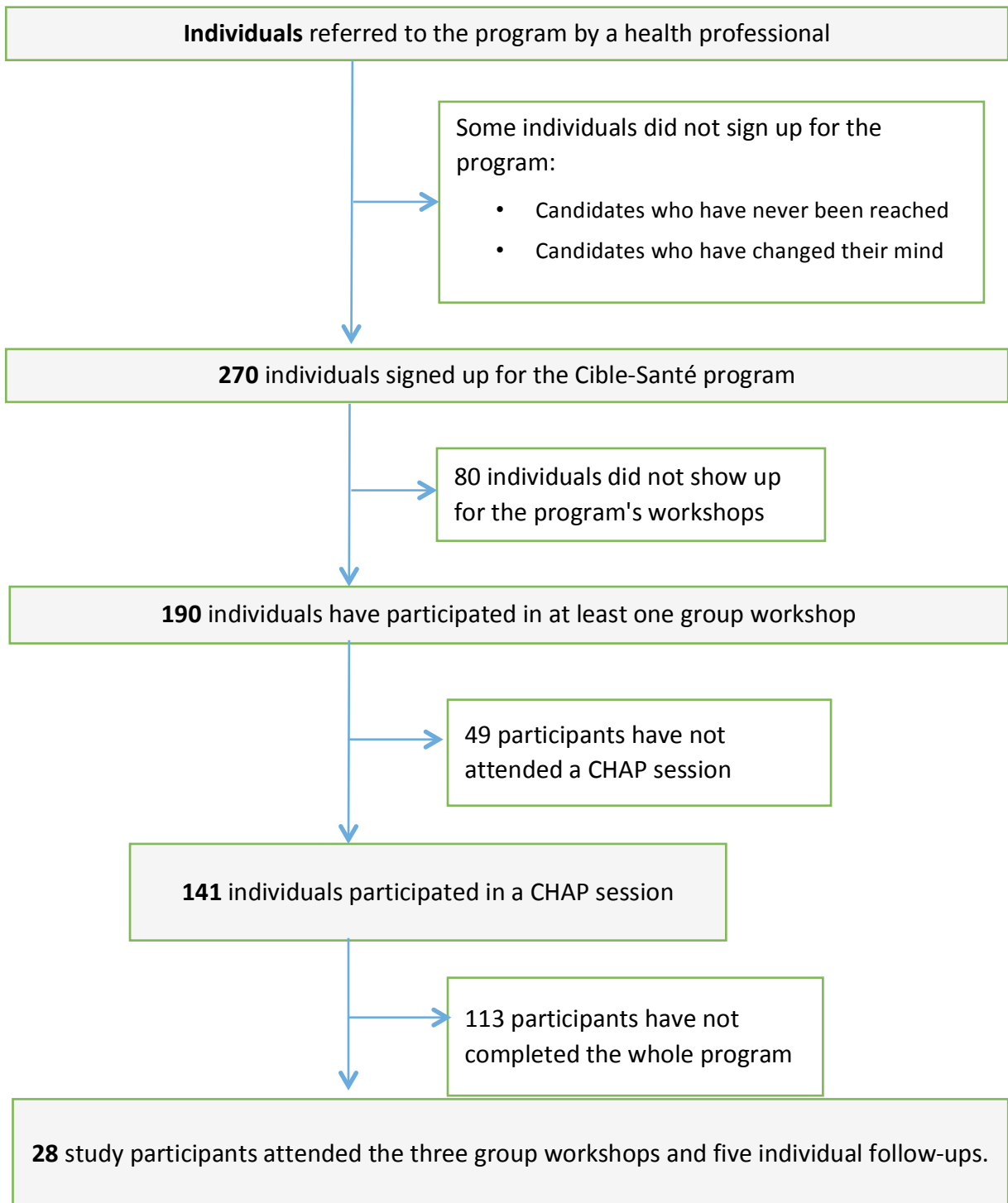
477

478 24. Robinson CA, Agarwal G, Nerenberg K. Validating the CANRISK prognostic
479 model for assessing diabetes risk in Canada's multi-ethnic population.
480 Chronic dis Inj Can. 2011;32:19-31.

481

482 **Figure 1: Algorithm for participation in the Cible-Santé**

483



484 **Table 1: Socio-demographic characteristics of participants**

	n	%
Age (n=140, average 59 years-old)		
18 to 45 years-old	15	10.7
45 to 54 years-old	34	24.3
55 to 64 years-old	41	29.3
65 years-old and over	50	35.7
Gender (n=141)		
Male	55	39.0
Female	86	61.0

485

486

487 **Table 2: Physical Measures**

	n	%
Waist Circumference (n=136)		
F<80cm H<94cm (Low Risk)	7	5.1
F80-88cm H<94-102cm (High Risk)	16	11.8
F>88cm H>102 cm (Very High Risk)	113	83.1
BMI (n=140)		
Normal (<25)	9	6.4
Overweight (25-29)	34	24.3
Obese (30-34)	57	40.7
Severely Obese (35-39)	25	17.9

Morbid Obese (40 et plus)	15	10.7
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Systolic Blood Pressure (n=140, average= 136.51)

Less than 120	18	12.9
120 to 139	73	52.1
140 to 159	39	27.9
160 and over	10	7.1

Diastolic Blood Pressure (n=140, average= 78.93)

Less than 80	78	55.7
80 to 84	30	21.4
85 to 89	15	10.7
90 and over	17	12.1

488

489

490 **Table 3: Lifestyle Habits**

	n	%
Daily consumption of fruit and vegetables (n=138, mean (SD) = 5)		
1 to 3 portions	41	29.7
4 to 6 portions	69	50.0
7 to 9 portions	24	17.4
10 portions and over	4	2.9
Physical Activity (n=131)		
Inactive	24	18.3
Very light (< 20 min walk /day)	22	16.8

Light (20 to 40 min walk /day)	42	32.1
Moderate (40 to 60 min walk /day)	27	20.6
Vigorous (> 1 h walk /day)	16	12.2

Smoking Status (n=141)

Smoker	13	9.2
None smoker	128	90.8

Stress day per week (n=126)

Rarely or never	60	47.6
Sometimes (1-2 day/week)	18	14.3
Often (3-4-5 day/week)	34	27.0
Regularly (6 -7 day/week)	14	11.1

491

492

493 **Table 4: Patient Activation Measure (n=141, average = 65.65)**

	n	%
Level 1: Disengaged and overwhelmed	9	6.4
Level 2: Becoming aware but still struggling	20	14.2
Level 3: Taking action and gaining control	43	30.5
Level 4: Maintaining behaviours and pushing further	69	48.9

494

495

496 **Table 5: Diabetes and CANRISK Score**

	n	%
Self-reported diabetes diagnosis (n=141)		
Diabetic	68	48.2
Non-diabetic	64	45.4
Unsure	9	6.4
Score CANRISK (n=72/73 did not declare being diagnosed with diabetes or unsure)		
Low Risk (score < 21)	3	4.2
Average Risk (21 to 32)	24	33.3
High Risk (33 to 42)	34	47.2
Very High Risk (> 42)	11	15.3

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