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

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1 **Title:**

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3 disease self-management program in Laval, Canada

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Abstract

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

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

Keywords:

Chronic disease

Self-management programs

Health promotion

Volunteers

Health profile

Patient Activation Measure

Background:

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

3

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 SMART[1] 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

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[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

The vast majority of participants (83.1%, 113/136) had a waist circumference of

more than 88 cm for women and more than 102 cm for men, and nearly 70%

(97/140) were classified as obese. Over 17% had a diagnosis of hypertension

(not shown in table) and more than a third had blood pressure above >140/ 90

mm Hg).

223

[INSERT TABLE 3 HERE]

225

Approximately half of participants reported to eating the recommended daily

servings of fruits and vegetables (four to six servings), and a similar proportion

reported little to no physical activity (16.8% and 32.1%) (Table 3). Nearly half of

the participants were classified at a level 4 of activation (Table 4).

230

[INSERT TABLE 4 HERE]

232

Of all 141 participants who had participated in a CHAP evaluation session, 68

(48.2%) reported being diabetic (Table 5). Those who had no diagnosis or who

were unsure (n=73) completed the CANRISK. More than 60% were classified as

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 patients[2] 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

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[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

Conclusion:

304

The evaluation by the CHAP team made it possible to draw a health profile of the

305

first cohort of Cible-Santé participants. CHAP volunteers were trained to

306

adequately measure blood pressure, body mass index and waist circumference,

307

and to assist participants in completing their questionnaires. The results showed

308

a very low attendance and completion rate. The program typically attracted

309

adults with some risk factors associated with their chronic conditions (high waist

310

circumference, obesity), but with an already high level of knowledge, skills and

311

confidence to participate in self-management activities.

312

313

This study provides a portrait of new participants to a self-management chronic

314

disease program, which highlights the potential of supporting chronic disease

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patients ready to make changes but also exposes the difficulty of attracting a

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larger number and diversity of participants and in encouraging completion of the

317

program. Further studies are needed to assess the effect of the program on self-

318

management skills and health outcomes of participants, test several recruitment

319

strategies to increase the diversity of the target population and to compare

320

participants' health profiles with non-participants.

321

322

323

List of abbreviations:

324

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

351   *Funding*

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.

368

369

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, Ronday 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:

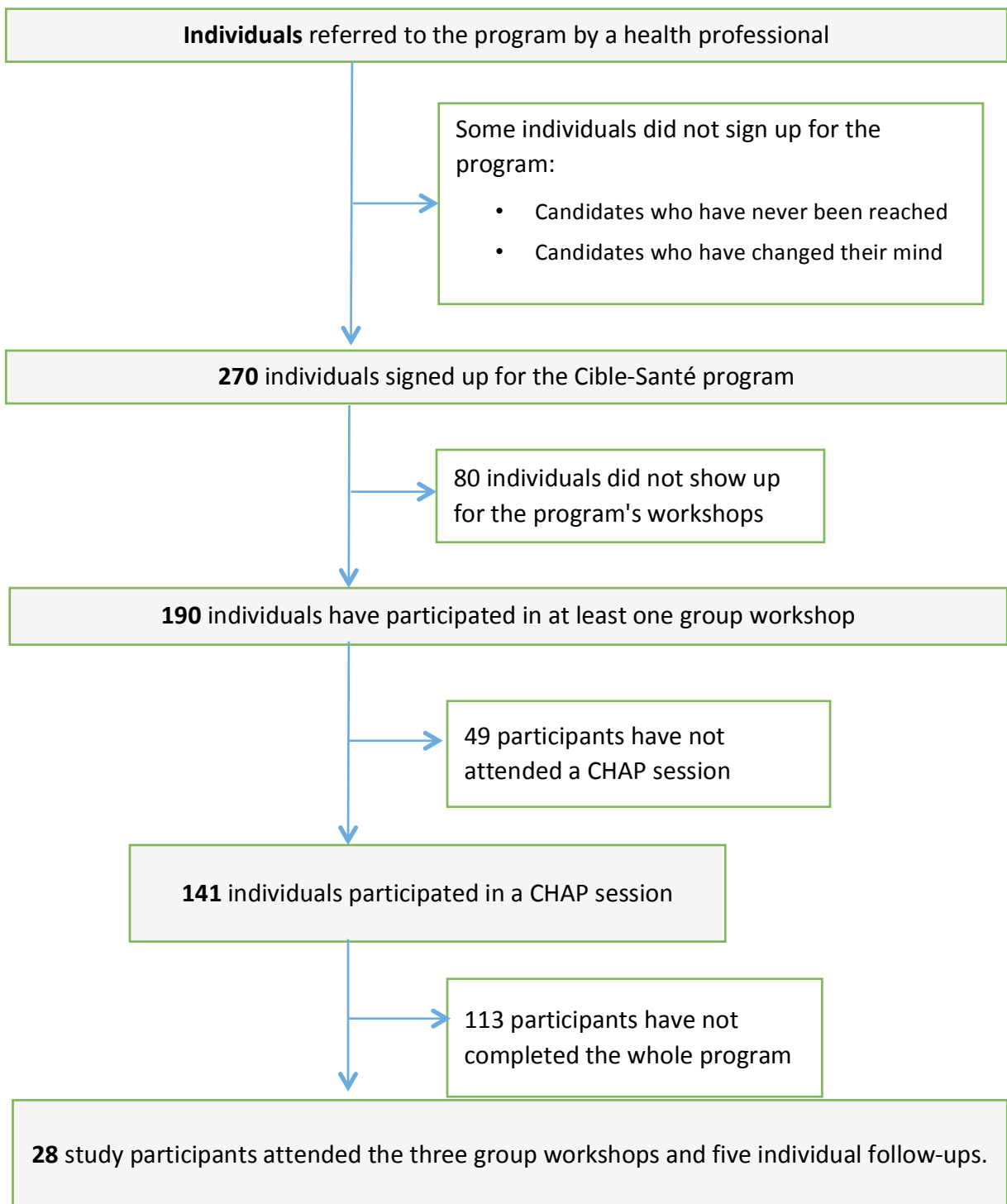476   10.1111/j.1475-6773.2004.00269.x

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

Individuals referred to the program by a health professional

Some individuals did not sign up for the program:
- Candidates who have never been reached
- Candidates who have changed their mind

270 individuals signed up for the Cible-Santé program

80 individuals did not show up for the program's workshops

190 individuals have participated in at least one group workshop

49 participants have not attended a CHAP session

141 individuals participated in a CHAP session

113 participants have not completed the whole program

28 study participants attended the three group workshops and five individual follow-ups.

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

	n	%
Morbid Obese (40 et plus)	15	10.7
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

Table 5: Diabetes and CANRISK Score

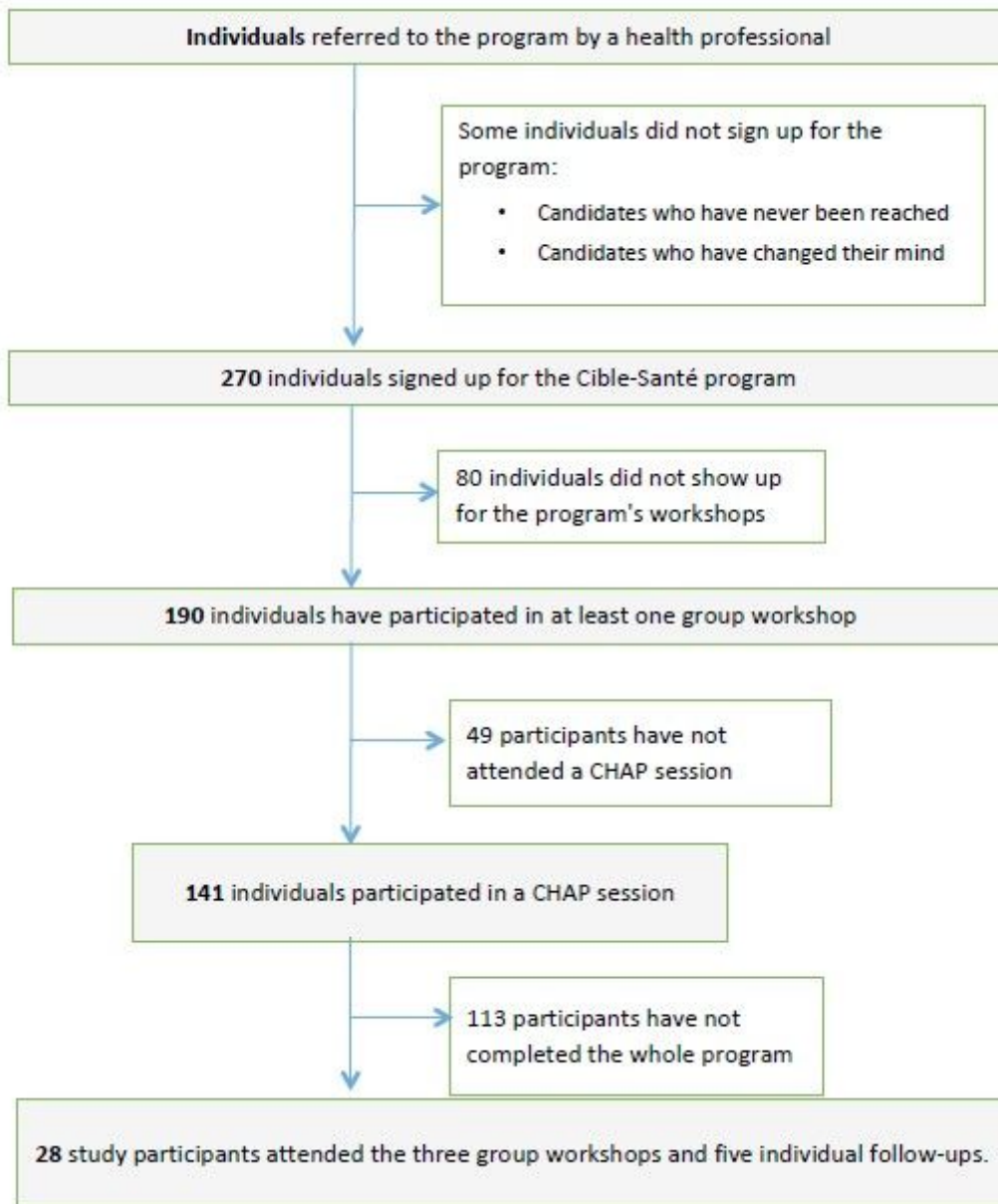|	n	%
Self-reported diabetes diagnosis (n=141)		
Diabetic	68	48.2
Non-diabetic	64	45.4
Unsure	9	6.4
Score CANRISK (n=72/73 did not declare being diagnosed with diabetes or unsure)		
Low Risk (score < 21)	3	4.2
Average Risk (21 to 32)	24	33.3
High Risk (33 to 42)	34	47.2
Very High Risk (> 42)	11	15.3

Figures

Figure 1

Algorithm for participation in the Cible-Santé