JGG 2022;70:192-201
doi: 10.36150/2499-6564-N407

Barriers and facilitators to older adults' engagement in healthy aging initiatives

Amber Hastings-Truelove[1], Setareh Ghahari[2], Angela Coderre-Ball[1], Dorothy Kessler[2], Jennifer Turnnidge[1], Britney Lester[1], Mohammad Auais[2], Nancy Dalgarno[1], Vincent DePaul[2], Catherine Donnelly[2], Marcia Finlayson[2], Diana Hopkins-Rosseel[2], Klodiana Kolomitro[1], Kathleen Norman[2], Trisha L. Lawson[2], Denise Stockley[3], Richard Van Wylick[1], Kevin Woo[4]

[1] Office of Professional Development and Educational Scholarship, Queen's University, Kingston, ON, Canada; [2] School of Rehabilitation Therapy, Queen's University, Kingston, ON, Canada; [3] Office of the Provost – Teaching and Learning, Queen's University, Kingston, ON, Canada; [4] School of Nursing, Queen's University, Kingston, ON, Canada

Objectives. To identify the facilitators and barriers to older adults' participation in healthy aging or cardiovascular rehabilitation programs.
Methods. We conducted a scoping review to identify healthy aging program evaluations which identified participant barriers and facilitators. We developed a search strategy in the following databases: MEDLINE, Embase, APA PsycInfo, and Cochrane CENTRAL, all on the Ovid platform and Ebsco CINAHL.
Results. We included 17 articles in this review. Our team categorized the barriers and facilitators of older adults' participation in healthy aging programs into seven themes: attitudes, organizational structure, accessibility, social structure, knowledge, demographics, and program specifics.
Conclusions. Understanding the facilitators and barriers that older adults face when deciding whether or not to participate or to continue participating in, healthy aging programs to promote in, cardiovascular health can help healthcare professionals provide optimal guidance for their patients and clients.

Key words: cardiovascular disease, healthy aging, engagement, healthcare professionals

Received: August 6, 2021
Published: May 31, 2022

Correspondence
Amber Hastings-Truelove
Professional Development & Educational Scholarship, Faculty of Health Sciences, Queen's University, 385 Princess Street
Kingston, ON, Canada K7L 1B9.
Tel.: 613-533-6000 x 79331.
E-mail: amber.hastings@queensu.ca

How to cite this article: Hastings-Truelove A, Ghahari S, Coderre-Ball A, et al. Barriers and facilitators to older adults' engagement in healthy aging initiatives. Journal of Gerontology and Geriatrics 2022;70:192-201. https://doi.org/10.36150/2499-6564-N407

INTRODUCTION

The demographics of Canada's population is shifting. In the 2016 Census, people 65 years and older outnumbered children 14 years and under for the first time [1]. As Canadians age, their risk of developing chronic diseases also increases. Currently, over one million Canadians are medically frail, meaning they are in "precarious health, have significant multiple health impairments, and are at higher risk of dying" [2]. The Canadian Frailty Network predicts that the number of medically frail Canadians will double in the next decade [3]. The cost associated with an unhealthy aging population is an even higher consumption of healthcare resources [3]. According to the Government of Canada, 44% of adults over the age of 20 have at least one of 10 common chronic conditions. One of them is cardiovascular disease (CVD) [4].

According to the World Health Organization (WHO), CVD is the most widespread noncommunicable disease (NCD) worldwide, contributing to 17.9 million deaths annually (44% of NCD deaths), and CVD accounts for 10% of the global disease burden [5]. The high prevalence of CVD, in turn, results in a high economic burden [6]. By 2030, it is predicted that 23 million people per year will die from CVD [6]. The primary load is attributed to either ischemic heart disease or cerebrovascular disease [7]. Individuals with CVD may also be at risk for deteriorating cognition, including memory functions, independent of age-related decline [8]. Our single-illness model healthcare systems are now scrambling to "meet the needs of older people with multiple, simultaneous, and often interrelated health and social issues that threaten their independence" [2].

Many factors can impact healthy aging, including malnutrition, risk of disease, socioeconomic inequalities, social environments, and negative attitudes about aging [9-11]. Healthy, active aging at any age can contribute to continued participation in social, economic, cultural, spiritual, and civic life as well as social, mental, and physical wellbeing, autonomy, and independence [12-14]. While there is ample evidence for the benefits of healthy aging initiatives for older adults with cardiovascular diseases, less is known about the motivations that people have for participating, or not, in healthy aging programs. To better understand why older adults choose to participate in healthy aging initiatives, we conducted a scoping review of the attitudes, barriers and facilitators towards ongoing participation in healthy aging initiatives.

METHODS

We followed the guidelines of Arksey and O'Malley (2005) for the reporting of scoping reviews [15].

Search strategy

A search strategy was developed by team members (AHT, JT, ACB) in consultation with a health librarian in Medline (Ovid MEDLINE(R) Daily and Epub Ahead of Print, In-Process & Other Non-Indexed Citations 1946 to Present) (see Appendix I). The search strategy was then translated into two additional databases EMBASE (Ovid, Embase Classic+Embase 1947 to present) and CINAHL (EBSCO, from inception).

Eligibility criteria

We included studies that reported on healthy aging and/or cardiovascular rehabilitation community or home-based programs for older adults (65+) with cardiovascular disease. Studies included in this review focused on participants' attitudes towards participation in healthy aging and/or cardiovascular rehabilitation programs, and the barriers and facilitators they experience to participating in these programs. We focused on the evaluations of these programs to understand the participant experience. As our focus was on older adults with cardiovascular disease, we limited our inclusion to studies where at least 50% of the study population was 65 years of age or older. We also included community-based cardiovascular rehabilitation programs within our definition of healthy aging programs. We included all quantitative, qualitative, and mixed methods study designs. We excluded studies if no data were available for extraction, they were not full publications, they did not report primary research (e.g., case reports, reviews, opinion pieces, editorials) or if the full manuscripts were not available in English. We also excluded studies in which participants were post-transplant recipients, used medical devices (pacemaker, implantable defibrillator, etc.), had primary congestive heart failure, pulmonary disease, or progressive neurological disorders. We did not include hospital-based healthy aging programs in this review as our focus was on community-based programming.

Study selection process

All titles and abstracts were screened for full-text review by two independent reviewers from a pool of three reviewers (SHT, JT, ACB) to determine if they met the inclusion and exclusion criteria outlined above. The reviewers discussed any differences in the inclusion decisions, with a third reviewer brought in if they could not reach an agreement. Two reviewers (AHT, BL) then independently reviewed all articles included in the full-text review for inclusion in data extraction, with discussion to resolve conflicts.

Data extraction

We developed a data extraction form to obtain consistent and comparable evidence from each study and assist in the synthesis of collected evidence. Extracted information included: study characteristics (title, authors, objective, and study design), participant characteristics, details of the healthy aging program (e.g., length of program, exercise, nutrition, lifestyle, frequency of meetings, etc.), and barriers and facilitators to participation. Extraction was conducted by two reviewers independently using the consensus tool in Covidence [16].

Synthesis approach

A thematic approach was taken to categorize the facilitators and barriers to participation. In the data extraction phase, the barriers and facilitators described within each study were extracted (AHT, JT). Team members (AHT, ACB) then met to discuss these results and

categorize them into themes. A narrative discussion is provided relating to barriers and facilitators. Seven themes were identified: attitudes, organizational structure, accessibility, social structure, knowledge, demographics, and program-specific barriers.

RESULTS

Our initial searches identified 10,734 titles. After removing duplicates, 7,810 titles remained. These remaining titles abstracts were then screened for relevance to inclusion and exclusion criteria, resulting in the selection of 121 articles for full text review. We selected 17 articles to be included in this review (see Figure 1). Reasons for exclusion at the full-text stage included: studies that did not have a mean age of participants 65 years of age or older (n = 43), interventions that did not include an evaluation of its barriers and facilitators to participation (n = 20), wrong patient populations (n = 18), in-hospital interventions (n = 6), studies without an healthy aging intervention (n = 5), full text was not found (n = 5), conference abstracts (n = 4), intervention protocols (n = 3), and studies exclusively on medication adherence (n = 1). The majority of the programs included in this review were a mixture of cardiac rehabilitation programs and community-based exercise, diet, smoking cessation, and drug adherence programs, and community-based health check programs. The majority of the programs were group-based and provided a combination of exercise program and support for behavioural changes for a healthier lifestyle. Program length varied from two to 12 weeks.

We have provided an overview of the studies included in the review in Appendix 1. Our team categorized the barriers and facilitators of older adults' participation in healthy aging programs into seven themes: attitudes, organizational structure, accessibility, social structure, knowledge, demographics, and program specifics.

Theme 1. Attitudes

Attitudes describe the beliefs, feelings, and attitudes participants expressed towards cardiac disease, cardiac rehabilitation, lifestyle consequences to health, and perceived susceptibility to future illness. Participants' attitudes towards healthy aging programs and lifestyle changes in general were found to both hinder and facilitate participation. Attitudinal barriers included participants viewing their recovery as a process outside their control [17], minimizing the severity of a myocardial infarction (MI) in their own minds [17], or feeling that attending the program would be too stressful [17] or painful [18] and, therefore, they avoided participation.

Other participants lacked motivation to change their lifestyle [19-21], or had negative feelings towards exercise [22,23]. Still other participants believed that their disease was the result of stress, rather than lifestyle factors like smoking and/or exercise [24]. Of the 10 studies that included an exercise component, participants from four of the studies worried that exercise could induce further health issues [18,20,25]. Some participants did not feel that healthy aging programs would improve their health [22,23,26]. Finally, some participants were worried that asking their family members/caregivers to help them to participate would be a burden [27].

Participants' attitudes were also found to facilitate their participation in healthy aging programs. These included the feeling of being personally responsible for their recovery [17], capable of managing the disease [24], having a personal desire to change their lifestyle [17,21], and viewing MI as a serious medical event that required action [17]. Other participants valued healthy aging programs and being active, noting an increased sense of well-being, and increased physical health [19,20,23,26]. Additionally, there were some gender differences with men perceiving that their recovery would be faster if they participated, while women were fearful of a reoccurrence of their illness if they did not participate [18].

Theme 2. Organizational structure

Organizational structure describes the referral and/or buy-in (or lack of referral and buy-in) by healthcare professionals (HCPs) regarding rehabilitation programs. An important barrier specific to organizational structure occurred when patients did not receive a referral from an HCP or when there was no buy-in from HCPs regarding these programs [17,18,22,23,26,28,29].

Referral to a healthy aging program, as well as support from HCPs, were notable facilitators to participants' decisions to attend a program across a range of studies [17-21,23,26,29,30]. Additionally, men described receiving written material about a program as facilitating their participation, while women described the opportunity to discuss health aging programs with their HCP as a facilitator [28].

Theme 3. Accessibility

Accessibility refers to the means and ability to be able to access programs. Across studies, participants described their ability to access a program, including transportation difficulties [18,19,21,23,25,28,29], an accessible location of a program [19,27], and the cost of a program (including lack of insurance) [18,20,21,25] as barriers to participation. Participants also described how time constraints because of work and family responsibilities prevented participation in healthy aging programs [20,23].

Having access to independent or private transportation was described as a facilitator to participation [29]. Additionally, participants' ability to change their work

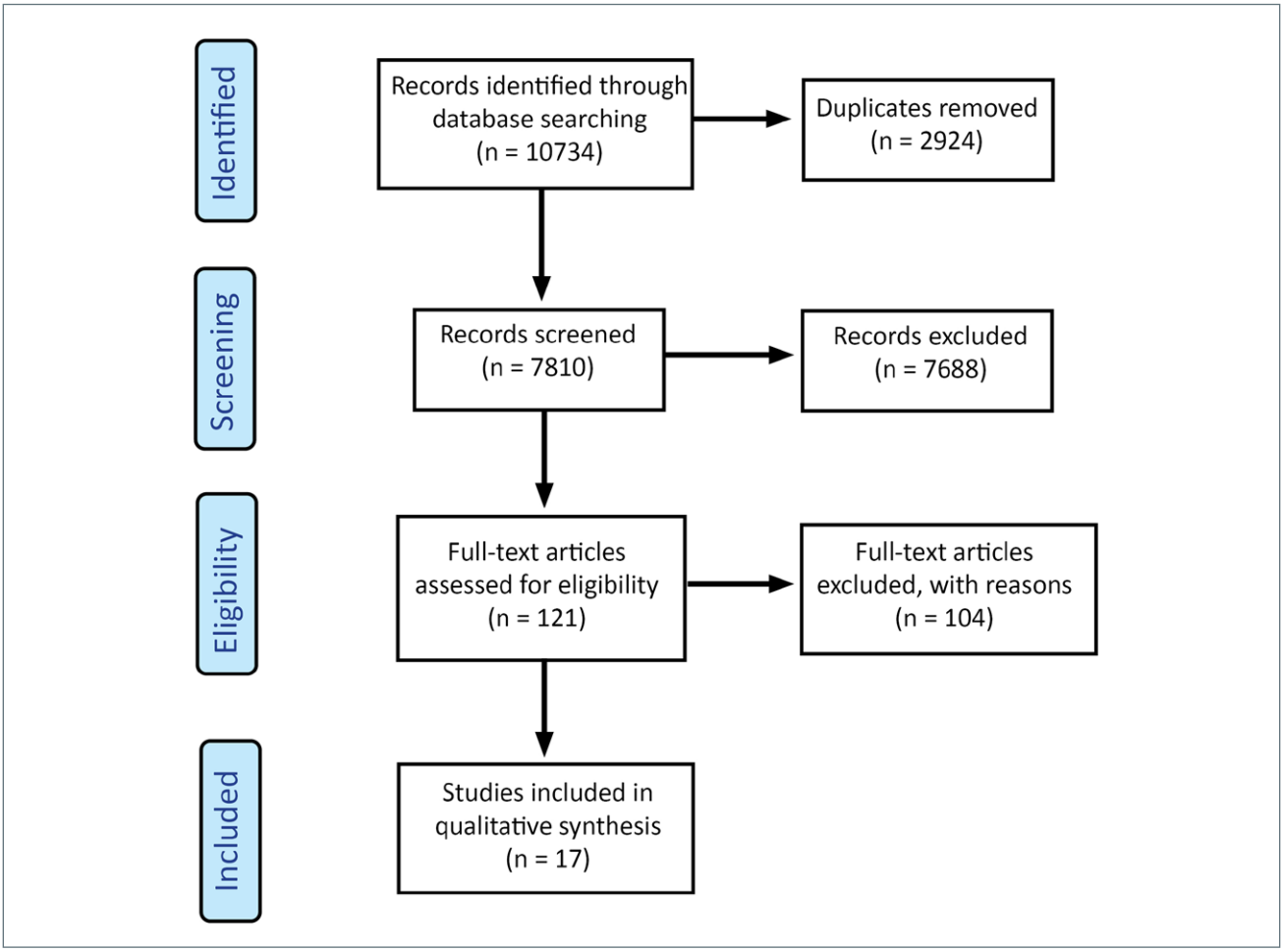

Figure 1. PRISMA flow diagram. This flow diagram outlines the number of studies excluded and included at each step of the review process.

schedules also supported their increased attendance [20], as did having the financial means to attend [20,30].

Theme 4. Social structure

Social structure describes the social network and support as well as family and/or work responsibilities that contribute to participation. A few social barriers were described across a small number of studies. Some participants described a lack of social support as impacting their ability to participate [21,28,30,31]. Participants across several studies also described how the social support they received from family and peers supported their participation in healthy aging programs [18,19,21,26,27,30]. Some participants also described worry over having to meet new people at a new venue [25].

Theme 5. Knowledge

Knowledge refers to the understanding or lack of understanding of cardiac rehabilitation's role in healthy aging. A few knowledge barriers were identified by participants, including a lack of understanding of what a healthy aging program involves and how participation can positively impact their cardiovascular health [17,18,22,25,26,29]. Additionally, one study found that some participants lacked an understanding of their own health status and risks factors [26], while another study suggested that exercise could be adapted to meet participants' physical impairments [19]. Finally, some prospective participants identified that being overloaded with paper information from HCPs results in a loss of knowledge retention, which in turn impacted their participation [19]. Analogously, patients in two studies identified that learning about healthy aging programs supported their decision to participate in a program [21,26].

Theme 6. Demographics

Demographics describes non-modifiable barriers and facilitators to participation, including age, gender, comorbidities, and education level. Several demographic metrics across different studies were identified as barriers to participation. These included advancing age

(over 80 years) [28,29,31], being a woman* [28], living alone [28,31,32], and lower education levels [21]. Additionally, certain comorbidities such as pain and fatigue [19,20,27], addiction (e.g., smoking) [20], the psychological influence of a cardiac event (e.g., irritation, depression) [27], having had valve surgery [23], or simply the number and type of comorbidities [19,20,22,23,29,31-33] posed a barrier to participation.

Individuals who did participate in healthy aging programs were more likely to be younger (64 +/- 12 years) [29,33], married or living with a partner [29,31], living close to the location of the program [19,21,31], and having obtained education levels beyond high school [21,33]. The results were mixed when it came to sex, with one study indicating males were more likely to participate [29], and another suggesting females were more likely to participate [23]. Having had an MI [31], cardiac surgery [23,33], a lower BMI and smaller waist circumference [21], and overall higher levels of health and functioning [21,26] were all noted more often in individuals who opted to participate.

Theme 7. Program specifics

Program-specifics refers to environmental or implementation specific aspects of programs which encourage or discourage participation. Some studies examined the barriers to participation in specific healthy aging programs. These barriers included classes being too large, a lack of opportunities to arrive a few minutes late or stay late to talk with staff [19,26,27,30], a lack of support from program staff and fellow participants [18,30], being tired after exercising [18], and feeling that recovery was too slow [18]. Additionally, participants described barriers related to the scheduling of the program, e.g., occurring too long after a cardiac event [27] and too few sessions [19,27,30]. Finally, participants described barriers pertaining to staffing including a lack of relationship with staff [26], lack of a physician present at sessions [27], and worries that staff were not suitably trained to care for them if something happened to them during a session [26].

Participants across different studies described key aspects of specific programs that encouraged their continued participation. Participants described the peer support they received as a facilitator to their continued participation [19,20,24,30] as well as the importance of a program being culturally inclusive [28]. The program structure also contributed to participation, including small group sizes [27], and the time of day of a program (afternoon) [27]. Finally, participants highlighted the importance of well-qualified, friendly, and reassuring staff [18,24,27,30].

* The median age of women in this program was 75 years. Age may be a confounding variable in this finding as other studies found mixed results for sex and participation in healthy aging programs.

DISCUSSION

Understanding the facilitators and barriers that older adults face when deciding whether or not to participate, or to continue participating in a healthy aging or cardiovascular rehabilitation program can help HCPs provide the best guidance for their patients and clients. Barriers that participants face are not limited to those affecting their health; rather, this review identified themes relating to individual attitudes, the organizational structures which individuals encounter, the social structures in which individuals operate, their ability to access programs, as well as their knowledge about their own health conditions. Additionally, individual demographics such as sex and marital status can influence individual participation, as well as the specific contextual elements that relate to the way programs are designed or implemented.

An individual's attitude was one factor to participation (or not) that was described in several studies. Individuals who felt responsible for their own recovery, who felt capable of managing their recovery, and who felt that attending a program was an effective way of obtaining information they needed to assist in their recovery were more likely to attend and to remain engaged in a program. Dechaine et al. [34] found that both men and women were intrinsically motivated by desires such as gaining strength and speed, losing weight, 'feeling better' and improving their mental health. Women, however, were more likely to also attribute their sense of motivation to an external desire not to let down program staff, while men were more likely to see the program as a task they could accomplish [34]. When individuals viewed their recovery as someone else's responsibility (e.g., HCPs), when they had negative perceptions of exercise (e.g., stress or pain), or if they were fearful that engagement in a program may cause a setback in their health, then they were less likely to participate. These findings align with findings from Bennett et. al. [35] who suggest that when cardiac patients attribute their health status to something that is within their control and that can be changed with behaviour, they are more likely to make adaptive changes than when they attribute their health status to non-modifiable factors such as biology. Correspondingly, an individual's knowledge about healthy aging programs impacted participation. Individuals who had learned about healthy aging programs were more likely to attend whereas, individuals who did not attend were more likely to lack an understanding of what a healthy aging program involves. Additionally, participants of healthy aging programs were more likely to report having received a referral and/or support from their HCPs regarding participation. Together, these important barriers and facilitators point to the important role HCPs play in educating, advocating and supporting

their patients' participation in healthy aging programs. Participants also described many barriers and facilitators specific to the structure and management of healthy aging program themselves. Participants generally preferred smaller programs, with flexible schedules that were located in easily accessible locations and were run by competent, knowledgeable, and supportive staff. When participants experienced success, they reported increases in their confidence, motivation, and overall health which further facilitated their continued participation. The health benefits of healthy aging programs are well documented; however, encouraging participation is difficult and attrition is high. Developing programming that appeals to and supports its participants is critical to improving the health of older adults.

There are a number of steps that HCPs can take to facilitate increased engagement in healthy aging programs. These can include advocacy through a coordinated effort of politicians, HCPs and educators to address ageism, and the adoption of person-centred, interdisciplinary, community-based programs and interventions for healthy aging. Program designs should address not only the physical needs of healthy aging, but also the mental and social needs to promote both fitness and overall wellbeing.

Some of the studies included in this scoping review were limited by a small sample size, making it challenging to generalize the results. Additionally, we limited the included studies to those disseminated in English, due to the vast number of included studies. As such, our results are only generalizable to programs that were reported in English language journals. Most of the studies included in this review were also English language programs, which means that non-English speakers, such as recent immigrants, were excluded from these studies. The lack of studies reporting on multilingual programs suggests an additional participant barrier that was not captured in this review.

CONCLUSIONS

The diversity of facilitators and barriers for older adults with cardiovascular disease participating in healthy aging programs suggests that HCPs need to employ multiple strategies to help increase engagement by this group. Understanding how demographics, knowledge, attitudes, accessibility, organizational structures, and social structures impact an individual's ability or motivation to participate in a healthy aging program can provide healthcare providers and allied health professionals insight into which types of healthy aging programs may best meet not only the health needs of their patients, but also best suit their personalities and lifestyles.

Acknowledgement

The Author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: We would like to thank the Pfizer Global Medical Grant program for funding this work [grant number 57505093].

Conflict of interest

The Authors declare no conflict of interest.

Funding

Pfizer Global Medical Grant 57505093.

Author contributions

AHT, JT, and ACB developed the search strategy. All Authors reviewed initial search findings to refine search terms. SHT, JT, ACB, AHT, BL, SG, and DK contributed to the review process. Results were reviewed and discussed by all Authors. All Authors contributed to the writing and review of the manuscript.

Ethical consideration

As this was a literature review, we did not conduct any research with human participants. This review was part of a larger study for which we did obtain ethics from Queen's University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board # 6029800; however, no part of this literature review required participant consent, so I'm not sure how to complete this statement.

References

1 Canada S. 2016 Census of population – data products (https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/index-eng.cfmfiles/12672/index-eng.html).

2 Williams R. A national seniors strategy needs to account for complexity in the aging process. Policy Magazine. Policy 2018.

3 Network CF. Frailty matters (https://www.cfn-nce.ca/frailty-matters).

4 Canada PHAo. Prevalence of chronic diseases among canadian adults (https://www.canada.ca/en/public-health/services/chronic-diseases/prevalence-canadian-adults-infographic-2019.htmlfiles/12730/prevalence-canadian-adults-infographic-2019.html).

5 Organization WH. Noncommunicable diseases (https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases).

6 Bloom DE, Cafiero ET, Jané-Llopis E, et al. The Global Economic Burden of noncommunicable diseases. Geneva: World Economic Forum 2011.

7 Roth GA, Forouzanfar MH, Moran AE, et al. Demographic and epidemiologic drivers of global cardiovascular mortality. N Engl J Med 2015;372:1333-1341. https://doi.org/10.1056/NEJMoa1406656

[8] Smith EE. Clinical presentations and epidemiology of vascular dementia. Clin Sci 2017;131:1059-1068. https://doi.org/10.1042/CS20160607

[9] Appleton A. Healthy ageing and nutrition. InnovAiT 2017;10:549-552.

[10] Beard JR, de Carvalho IA, Sumi Y, et al. Healthy ageing: moving forward. Bulletin of the World Health Organization 2017;95:730-770.

[11] Lu W, Pikhart H, Sacker A. Socioeconomic determinants of healthy ageing: evidence from the English Longitudinal Study of Ageing. Lancet 2018;392:S54-S54. https://doi.org/10.1016/S0140-6736(18)32883-6

[12] Organization WH. Active ageing: a policy framework (http://www.who.int/ageing/publications/active_ageing/en/files/12711/en.html).

[13] Sidorenko A, Zaidi A. Active ageing in cis countries: semantics, challenges, and responses. Curr Gerontol Geriatr Res 2013:1-17. https://doi.org/10.1155/2013/261819

[14] Walker A, Naegele G. The politics of old age in Europe, Buckingham: Open University Press 1999, pp. 230.

[15] Arksey H, O'Malley L. Scoping studies: towards a methodological framework. International journal of social research methodology 2005;8:19-32. https://doi.org/10.1080/1364557032000119616

[16] Covidence (https://www.covidence.org/homefiles/12741/home.html).

[17] Wyer SJ, Earll L, Joseph S, et al. Deciding whether to attend a cardiac rehabilitation programme: an interpretative phenomenological analysis. Coron Health Care 2001;5:178-188. https://doi.org/10.1054/chec.2001.0136

[18] Dolansky MA, Moore SM, Visovsky C. Older adults' views of cardiac rehabilitation programs: is it time to reinvent? J Gerontol Nurs 2006;32:37-44. https://doi.org/10.3928/0098-9134-20060201-10

[19] Lennon OC, Doody C, Ni Choisdealbh C, et al. Barriers to healthy-lifestyle participation in stroke: consumer participation in secondary prevention design. Int J Rehabil Res 2013;36:354-361. https://doi.org/10.1097/MRR.0b013e3283643d48

[20] Mitchell R, Muggli M, Sato A. Cardiac rehabilitation: participating in an exercise program in a quest to survive. Rehabil Nurs 1999;24:236-239. https://doi.org/10.1002/j.2048-7940.1999.tb02189.x

[21] Yates BC, Braklow-Whitton JL, Agrawal S. Outcomes of cardiac rehabilitation participants and nonparticipants in a rural area. Rehabil Nurs 2003;28:57-63. https://doi.org/10.1002/j.2048-7940.2003.tb02030.x/

[22] Grace SL, Shanmugasegaram S, Gravely-Witte S, et al. Barriers to cardiac rehabilitation: does age make a difference? J Cardiopulm Rehabil Prev 2009;29:183-187. https://doi.org/10.1097/HCR.0b013e3181a3333c

[23] Plach SK. Women and cardiac rehabilitation after heart surgery: patterns of referral and adherence. Rehabil Nurs 2002;27:104-109. https://doi.org/10.1002/j.2048-7940.2002.tb01998.x

[24] Clark AM, Barbour RS, White M, et al. Promoting participation in cardiac rehabilitation: patient choices and experiences. J Adv Nurs 2004;47:5-14. https://doi.org/10.1111/j.1365-2648.2004.03060.x

[25] Adsett J, Hickey A, Nagle A, et al. Implementing a community-based model of exercise training following cardiac, pulmonary, and heart failure rehabilitation. J Cardiopulm Rehabil Prev 2013;33:239-243. https://doi.org/10.1097/HCR.0b013e3182930cea

[26] Krska J, du Plessis R, Chellaswamy H. Views and experiences of the nhs health check provided by general medical practices: cross-sectional survey in high-risk patients. J Public health (Oxf) 2015;37:210-217. https://doi.org/10.1093/pubmed/fdu054

[27] Hagberth V, Sjöberg T, Ivarsson B. Older women with a serious cardiac event experience support with a vifladt & hopen inspired patient group education programme. Eur J Cardiovasc Nurs 2008;7:140-146. https://doi.org/10.1016/j.ejcnurse.2007.09.003

[28] Hutchinson P, Meyer A, Marshall B. Factors influencing outpatient cardiac rehabilitation attendance. Rehabil Nurs 2015;40:360-367. https://doi.org/10.1002/rnj.202

[29] Schulz DL, McBurney H. Factors which influence attendance at a rural Australian cardiac rehabilitation program. Coron health care 2000;4:135-141. https://doi.org/10.1054/chec.2000.0086

[30] Moore SM. Women's views of cardiac rehabilitation programs. J Cardiopulm Rehabil 1996;16:123-129. https://doi.org/10.1097/00008483-199603000-00007

[31] Harris DE, Record NB, Gilbert-Arcari J, et al. Cardiac rehabilitation with nurse care management and telephonic interactions at a community hospital: program evaluation of participation and lipid outcomes. Lippincotts Case Manag 2003;8:141-159. https://doi.org/10.1097/00129234-200307000-00002

[32] Resnick B, Shaughnessy M, Galik E, et al. Pilot testing of the praisedd intervention among african american and low-income older adults. J Cardiovasc Nurs 2009;24:352-361. https://doi.org/10.1097/JCN.0b013e3181ac0301

[33] Weingarten MN, Salz KA, Thomas RJ, et al. Rates of enrollment for men and women referred to outpatient cardiac rehabilitation. J Cardiopulm Rehabil Prev 2011;31:217-222. https://doi.org/10.1097/HCR.0b013e318207d2fa

[34] Dechaine CL, Merighi JR, O'Keefe TC. Healing the heart: a qualitative study of challenges and motivations to cardiac rehabilitation attendance and completion among women and men. Sex roles 2018;79:489-503. https://doi.org/10.1007/s11199-017-0873-5

[35] Bennett KK, Marte RM. Patient attributions for cardiac events: predictors of physical and psychological recovery. J Appl Soc Psychol 2013;43:660-672.

Appendix I. Study and population characteristics.

Study	Participants	Study design	Program details
24	n = 140 completed survey (n = 98 attendees and n = 87 males)	Quasi-experimental, mixed methods, purposive sampling	Heartmoves offers long-term, low- to moderate-intensity exercise classes and require minimal equipment. Classes are conducted by certified fitness instructors or other specifically accredited health care professionals. Classes include aerobic, resistance, and balance components.
	n = 88 participants older than 65 years; n = 52 participants younger than 65 years	Program evaluation via surveys	
23	n = 44 (n = 33 males)	Qualitative, purposive sampling	Twelve-week program that consisted of exercise sessions and health education on diet, stress, and smoking cessation. Patients were referred from primary and secondary care settings
	Age range was 51-69 years, with a mean age of 66 years	8 focus groups (n = 4 FG with participants with > 60% attendance; n = 2 FG with participants with < 60% attendance; n = 2 FG with 0% attendance)	Program eligibility: diagnosis of M1, post-CABG and angina, understand English
			Exclusion from program: evidence of psychosis or dementia
17	n = 40 (n = 20 males)	Descriptive study (focus groups and interviews), convenience sampling	No single CR program
	CR participants: n = 28 (n = 14 males)		Inclusion: first MI, CABS, or intracoronary intervention within the past 6 months; being 65 years of age or older; ability to read and speak English
	CR participants' mean age was 71.5 years (range 66-83 years)		
	Non-CR participants: n = 12 (n = 6 males)		
	Non-CR participants' mean age was 72 year (range 65 – 81 years)		
21	n = 1273 (n = 911 males)	Secondary analysis of data from a prospective study, quantitative, 9- month follow-up.	No single CR program
	Mean age was 65.9 +/- 11.2 years	Survey	Inclusion: coronary artery disease diagnosis, patients who had undergone percutaneous coronary interventions or acute coroner bypass or had diagnosis of heart failure or arrhythmia
			Exclusion: lack of English-language proficiency, incorrect contact information, no CAD diagnosis, orthopedic, neuromuscular, cognitive, or vision impairment, non-recent index event or treatment, previous attendance at CR, non-affective psychiatric disorders
26	n = 13 (all women)	A qualitative descriptive design, one year follow-up	Educational program: the information presented in the sessions is guided by the questions and needs as expressed by the participants. The program focuses on self-understanding of the patients rather than on professionals. Participants are encouraged to talk to each other in group discussions and informally. Each group met three times, two and a half hours each time
	Age range was 73-87 years	Focus groups (n = 3)	

▶

Appendix I. Study and population characteristics.

Study	Participants	Study design	Program details
30	Cohort 2 participated in CR enrolled in the nurse managed modified CR program with telephonic interaction:	Nonrandomized, retrospective, descriptive study	Cohort 2 program: patients assigned to a care manager (nurse). Program focused on patient education, emotional support early symptom recognition and triage, medication adherence, ongoing interactions with the PCPs, and achievement of recommendations around nutrition, exercise, smoking, lipids, and blood pressure
	n = 158 (n = 83 males)		Inclusion: discharged to home or another acute care facility with a diagnosis of MI or angina; resided in the hospital service area; lived for at least one-month post-discharge
	Mean age was 68.6 +/- 1.7 years		
27	n = 143 (n = 77 males; n = 66 females)	Quasi-experimental	No single CR program
	Participations were 50 years of age and older; mean age was 75 years	Survey	Inclusion: patients discharged from hospital with International Classification of Disease codes for cardiac diagnosis, older than 50 years of age and lived in New Zealand
25	n = 644 (n = 514 males)	Cross-sectional, purposive sampling	The program (Health Check) was delivered through general medical practices and offers advice regarding lifestyle (smoking, drinking, nutrition, and exercise) and medication for individuals with an increased risk of developing coronary heart disease, stroke, diabetes and chronic renal disease
	n = 435 participants over the age of 65 years		Inclusion: potential participants were identified through medical records
18	n = 22 (n = 12 males)	Qualitative, purposive sampling	No single CR program
	Participants were 50 years of age and older; mean age was 71.4 years with a range of 53-87 years	Focus groups (n = 4)	
19	n = 6 (n = 2 males)	Qualitative, purposive sampling	YMCA cardiac exercise program. The YMCA cardiac program aims to educate both client and family about cardiac risk factors, assist with lifestyle modifications, and promote physical activity and conditioning
	Age range: 61-80 years	Interviews	
29	n = 10 (all women)	Qualitative, convenience sampling	Located in suburban ambulatory care center. Program was a 12-week exercise regimen and nutrition counselling
	Mean age was 72 years with a range of 62 to 83 years	Focus groups	Inclusion: women, completed the program within 6-months of study recruitment were 65 years of age or older and could speak and understand English
	Female, 10		
22	n = 157 (all women)	Quantitative, cross-sectional, descriptive study	No single CR program
	Mean age was 65.5 +/- 11.3 years		

Appendix I. Study and population characteristics.

Study	Participants	Study design	Program details
31	n = 22 (n = 8 males)	Quantitative, single-group repeated-measures design	The program 'People Reducing Risk and Improving Strength through Exercise, Diet and Drug Adherence (PRAISEDD)' included motivational, educational, and exercise sessions to strengthen participants' ability to adhere to exercise, diet, and medication recommendations. The program was 12 weeks long and included 60-minute intervention sessions 3 times per week
	Participants were older than 65 year, with a mean age of 76.4 years		Inclusion: older than 65 years of age, could read and write English, and passed a cognitive test, could give consent, had known history of hypertension, hyperlipidemia and sedentary behaviour, were on antihypertensive, or lipid-lowering medications
			Exclusion: if evaluated by a primary healthcare professional within 2 years and if did not pass an exercise screening test
28	n = 79 (n = 52 males)	Quantitative, convenience sampling	Cardiac rehabilitation program of Wimmera Health Care Group includes eight weekly sessions of exercise and education.
	Age unclear; Age at AMI for referred participants as 62.4 years and for not referred participants was 68.95 years		
32	n = 450 (n = 299 males)	Quantitative, retrospective	CR program is located in a multispecialty outpatient clinic building and is fully integrated with the 2 hospitals in our healthcare system
	Mean age was 66 +/- 13 years	Medical record review	Inclusion: diagnosis acute myocardial infarction, stable angina pectoris, coronary artery bypass surgery, and after March 22, 2006 included diagnoses of percutaneous coronary intervention, heart valve repair or replacement, and heart transplantation
16	n = 21 (n = 17 males)	Qualitative, convenience sampling	The Gloucestershire Royal Cardiac Rehabilitation Program is a seven-week program for patients 4-6 weeks post MI. Participants attend once a week for seven weeks and two follow-ups within six months. The program includes lifestyle education, exercise and stress management
	Mean age of program attenders was 59.6 years with a range of range 39-70		
	Mean age of participants who initially accepted offer to participate, but then did not attend was 59.7 years with a range 51-72 years		
	Mean age of program non-attenders was 65.83 year with a range 55-71		Inclusion: patients who had been admitted to hospital with MI and were eligible for CR.
20	n = 222 (n = 163 males)	Quantitative, exploratory, comparative design	No single CR program
	Mean age was 67.8 years with a range of 41-92 years		Inclusion: all patients who had been hospitalized for a cardiac illness.