



Patient-informed insights among women in cardiac rehabilitation across Canada: Is it time to pay more attention to age?

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ABSTRACT

Background: Women with cardiovascular disease (CVD) are less likely to be referred to, enrol in, and adhere to a cardiac rehabilitation (CR) programme. The prevalence of CVD is increasing among younger adults (under 65 years).

Material and methods: Using a qualitative descriptive design, semi-structured interviews were conducted with women with CVD across Canada to explore barriers to and preferences for attending CR. Using deductive thematic analysis, interview responses were reviewed, coded, and categorised into themes and subcategories according to age group.

Results: A total of 20 women (30% younger, 45% middle-aged and 25% older-aged) from 5 provinces in Canada participated in this study. Younger women reported feelings of isolation as the youngest in CR groups and peer/support groups, noting the absence of peers with similar experiences. Younger and middle-aged women noted barriers to asking age-relevant questions when surrounded by older participants, and a strong preference emerged for tailoring CR classes to participants of similar ages..

Conclusions: To meet the needs of women recovering from cardiac events, CR programming should be sensitive to participants' age, life-stage, and associated responsibilities.

Keywords: cardiac rehabilitation, women, age

INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of death for women in Canada. Women face an increased risk of developing CVD because of sex-specific risk factors, including pregnancy complications, menopause, and breast cancer¹. Unfortunately, women remain largely underinformed about these specific risk factors, despite advocacy efforts (e.g. establishment of the Canadian Women's Heart Health Alliance) to increase women's awareness of CVD that have been made over the last two decades. A national survey in the United States revealed that awareness of CVD as the leading cause of death among women declined between 2009 and 2019, particularly among women aged 25–64 years². In the United States, few physicians (22%) and cardiologists (42%) reported feeling adequately prepared to assess CVD in women³, and Canadian survey results revealed a general lack of awareness among physicians regarding women-specific CVD prevalence, risk assessment, and management (59.9% among primary care physicians and 20.2% among cardiologists)⁴. Furthermore, the rate of CVD-related deaths has increased among younger women, with approximately one-third of CVD events occurring among women <65 years^{5,6}.

Cardiac rehabilitation (CR) programmes are a Class 1A recommendation for the treatment and management of CVD and are composed of exercise-training and education sessions (e.g. nutrition, counselling and goal-setting). These programmes have been shown to improve physical and mental health outcomes and reduce the risk of secondary cardiac events and mortality^{7,8}. Unfortunately, women are less likely to be referred to, enrol in, and adhere to these programmes^{9,10}. The underrepresentation of women in CR has been in part attributed to gender bias in diagnosis and referrals, lack of time, and gender-related barriers including greater caregiving responsibilities, which pose substantial challenges for attendance¹⁰. Barriers to CR attendance among women have been well-documented, and possible solutions have been suggested, including women-only classes, flexible scheduling, and hybrid options (i.e. in-person/virtual)^{10–12}. Despite these suggested improvements to increase the representation of women within CR, women comprise only 34% of participants in CVD exercise research¹³. Continued efforts to address this inequity are required, including ensuring that women with CVD are provided with programming access and options that best meet their needs.

Historically, CR programming has been designed based on the needs of older men, a key demographic affected by CVD. However, research continues to highlight the significant impact of CVD on women and to underscore the importance of considering gender in symptoms, diagnosis, treatment, and management of CVD^{14,15}. As a result, recent efforts have been made to better meet women's needs and to increase women's enrolment and adherence to CR programmes, including the creation of gender-specific classes, flexible programme timing, and various exercise modalities^{16,17}. These solutions may be of particular benefit to younger women, who may be balancing work and family-related responsibilities in addition to their own health needs (e.g. requiring childcare to attend CR). A recent meta-analysis reported that women-specific CR programmes are associated with positive clinical outcomes and greater psycho-social wellbeing; however, authors noted the need for more research in this area¹⁸.

In addition to gender, age is an important factor to consider in relation to CVD and how it is experienced and managed, and when designing and implementing CR programmes. Recent scholarship has reported that younger (<44 years) and middle-aged (45–64 years) adults experience higher anxiety upon entry to CR and

are more likely to drop out when compared to older (≥ 65 years) adults¹⁹. While clinical programme data and quantitative measures have pointed to inequities in women's referral to and participation in CR programmes, as well as age-related differences at intake and completion. Few studies have qualitatively explored the lived and social experiences of CR participants. Such studies are needed to better understand how age at diagnosis/entry into CR influences programme perceptions and experiences. Limited qualitative insights suggest that among those with spontaneous coronary artery dissection, younger females experience their recovery differently than their older (>50 years) counterparts²⁰. More qualitative, patient-centred approaches are necessary for capturing participants' experiences in their own words that can inform more tailored, gender, and age-appropriate CR design for future participants. Thus, the purpose of this study was to explore the experiences of women attending CR programmes in Canada across the lifespan to understand what aspects of the programme they perceived to be helpful or in need of improvement.

MATERIALS AND METHODS

Using a qualitative descriptive design²¹, we conducted semi-structured interviews with 20 Canadian women (≥ 18 years; self-identified as women) diagnosed with established CVD. Participants were recruited using convenience sampling, and all had been referred to and attended at least one CR programme. Recruitment was conducted through posters on online platforms (e.g. Facebook groups, X) and by contacting CR programmes, community centres, and fitness centres via telephone across Canada. The final sample consisted of participants from five provinces: Nova Scotia ($n = 5$), Ontario ($n = 7$), Manitoba ($n = 2$), Alberta ($n = 1$) and British Columbia ($n = 5$). Additional demographic information is displayed in Table 1.

Data collection and analysis

All interviews were conducted between May 2023 and January 2024, virtually via Zoom, and lasted an average of 40 minutes. Interviews explored participants' general experiences of the CR programme, perceived barriers to attendance, and their recommendations for an 'ideal' CR programme. Demographic information (e.g. age, CVD type, rural vs urban residence and education level) was also collected via a self-report questionnaire. Informed consent was obtained, and each interview was audio-recorded and transcribed verbatim.

Given the importance of understanding how experiences of CR might differ across the lifespan, age at diagnosis or age of first cardiac event was used to determine age groups, which were categorised as: younger (≤ 44 years, $n = 6$), middle-aged (45–64 years, $n = 11$), and older (≥ 65 years, $n = 3$). Data were analysed using a deductive thematic analysis^{22–24}, with specific attention to identifying barriers and future recommendations, and to examining how these differed by age.

RESULTS

A total of 20 women (30% younger, 45% middle-aged, and 25% older-aged) from 5 different provinces in Canada participated. Of these participants, 30% lived in rural areas. Interviews provided rich insight into women's experiences of CR across the lifespan.

Table 1. Participant demographic information

Demographic	All participants	Younger aged (≤44 years) (<i>n</i> = 6)	Middle aged (45–64 years) (<i>n</i> = 11)	Older aged (≥65 years) (<i>n</i> = 3)
Diagnosis ^a				
Coronary artery disease	55% (<i>n</i> = 11)	50% (<i>n</i> = 3)	45.4% (<i>n</i> = 5)	100% (<i>n</i> = 3)
Myocardial infarction	30% (<i>n</i> = 6)	33% (<i>n</i> = 2)	27.2% (<i>n</i> = 3)	100% (<i>n</i> = 3)
Spontaneous coronary artery dissection	15% (<i>n</i> = 3)			33% (<i>n</i> = 1)
Stroke	5% (<i>n</i> = 1)		9% (<i>n</i> = 1)	
Valvular disease	20% (<i>n</i> = 4)	33% (<i>n</i> = 2)	18% (<i>n</i> = 2)	
Atrial fibrillation	5% (<i>n</i> = 1)		9% (<i>n</i> = 1)	
Current living situation				
Live alone	10% (<i>n</i> = 2)	0%	9% (<i>n</i> = 1)	33% (<i>n</i> = 1)
Live with significant other	65% (<i>n</i> = 13)	50% (<i>n</i> = 3)	73% (<i>n</i> = 8)	67% (<i>n</i> = 2)
Live with significant other and kids	25% (<i>n</i> = 5)	50% (<i>n</i> = 3)	18% (<i>n</i> = 2)	0%
Current province				
Nova Scotia	25% (<i>n</i> = 5)	50% (<i>n</i> = 3)	9% (<i>n</i> = 1)	33% (<i>n</i> = 1)
Ontario	35% (<i>n</i> = 7)	33% (<i>n</i> = 2)	45% (<i>n</i> = 5)	0%
Manitoba	10% (<i>n</i> = 2)	0%	18% (<i>n</i> = 2)	0%
Alberta	5% (<i>n</i> = 1)	0%	9% (<i>n</i> = 1)	0%
British Columbia	25% (<i>n</i> = 5)	17% (<i>n</i> = 1)	18% (<i>n</i> = 2)	67% (<i>n</i> = 2)
Current urban or rural dweller				
Urban dweller	65% (<i>n</i> = 13)	50% (<i>n</i> = 3)	82% (<i>n</i> = 9)	33% (<i>n</i> = 1)
Rural dweller	35% (<i>n</i> = 8)	50% (<i>n</i> = 3)	18% (<i>n</i> = 2)	67% (<i>n</i> = 3)
Highest level of education				
Elementary school	5% (<i>n</i> = 1)	0%	9% (<i>n</i> = 1)	0%33% (<i>n</i> = 1)
Some college/university	20% (<i>n</i> = 5)	33% (<i>n</i> = 2)	18% (<i>n</i> = 2)	33% (<i>n</i> = 1)
Completed post-secondary school	35% (<i>n</i> = 7)	50% (<i>n</i> = 3)	27% (<i>n</i> = 3)	33% (<i>n</i> = 1)
Masters, PhD	35% (<i>n</i> = 7)	17% (<i>n</i> = 1)	45% (<i>n</i> = 5)	
Current employment status				
Working	25% (<i>n</i> = 6)	17% (<i>n</i> = 1)	45% (<i>n</i> = 5)	0%
Retired (withdrawal from the workforce)	40% (<i>n</i> = 8)	17% (<i>n</i> = 1)	36% (<i>n</i> = 4)	100% (<i>n</i> = 3)
Unable to work due to disability	15% (<i>n</i> = 3)	33% (<i>n</i> = 2)	9% (<i>n</i> = 1)	0%
Stay at home parent/caregiver	10% (<i>n</i> = 2)	33% (<i>n</i> = 2)	0%	0%
Working and student	10% (<i>n</i> = 1)	0%	9% (<i>n</i> = 1)	

^aRespondents could select more than one diagnosis

This project was approved by the Ethics Board at Acadia University (REB: 23-05), and all participants provided informed consent

Barriers by age

All participants spoke about barriers to attending CR, with common responses including challenges associated with receiving a diagnosis, obtaining a referral, or lacking the opportunity to enrol in a programme due to COVID-19. While some respondents were able to join a virtual programme amid the pandemic, the lack of programme offerings in more rural areas and/or the lack of reliable internet to access CR was a commonly cited barrier (30% of participants). However, some barriers were unique to different age groups. For example, feelings of isolation were noted among younger participants. Many described the difficulty associated with not having a friend outside of CR to share their experiences. They also expressed feeling embarrassed by their condition and diagnosis due to their younger age

and to social perceptions of CVD primarily being an older person's disease. This sentiment was captured by P1 (Participant No 1), who shared:

I was less than half the age of everybody else there and so it was also a little awkward at first cause people were like oh are you here with someone are you here with your parent? Like no I'm just here with me.

Younger and middle-aged participants also described a lack of social support from family/friends or their doctor, which they believed was in part due to a lack of societal awareness of who CD impacts. Many expressed facing mental health challenges (e.g. depression) and feeling anger and resentment towards their diagnosis or the denial they experienced in a cardiac event. P7 (Participant No 7) shared the following:

I was surrounded by people in the program that were nothing like me. And so as the weeks went by I was actually finding that attending the program was making me feel worse, not physically but mentally because it was raising issues of anger and resentment. I was surrounded by a bunch of people who had made different lifestyle choices and yet I've made the right choices and here I was with them, so there was a lot of and anger and resentment

Younger and middle-aged participants also identified age-specific barriers, such as employment obligations and family responsibilities (e.g. childcare), which were not shared by their older counterparts. Location was another barrier identified, particularly for those in one-car households who had to negotiate vehicle use with a working spouse.

In contrast, older participants did not identify unique barriers to attendance. However, many acknowledged that for individuals at different life stages (e.g., those currently employed or with young families), attending CR would be difficult to prioritise.

Preferences within an 'ideal' CR programme: Not a 'one age suits all' approach

Participants were asked to describe their ideal CR programming, and women across all groups emphasised the importance of women-only programming. Many also suggested organising classes according to age and other considerations, such as fitness levels. Participants of all ages also recommended that staff closely monitor patients during exercise and acknowledge the challenges of attending classes due to personal responsibilities (e.g. young children at home), to avoid insinuations of guilt or shame.

Younger participants (≤ 44 years) emphasised the importance of CR programmes tailored to younger demographics. Specifically, some participants described discomfort when asking questions related to resuming sexual activity after a cardiac event or discussing topics, such as the impact of medications on the menstrual cycle. This discomfort was exacerbated due to being in a mixed-sex and predominantly older age CR class. P12 (Participant No 12) shared:

It [cardiac rehabilitation] was very clearly made for an 80-year-old man and I always remember because I was so young. I remember going and being like I can't believe I might have to sit in on a talk on how to have sex after a heart attack because I don't think we're probably on the same lines as the 80-year-old man.

Table 2. Selected quotes by age group

Outcome	Selected quotes	
Barriers		Preferences for CR
Younger (≤ 44 years)	'I was less than half the age of everybody else he was there and so it was also a little awkward at first cause people were like oh are you here with someone are you here with your parent? Like no I'm just here with me.'	'Being with other women my age, having our voices heard from the staff who get it [work and family responsibilities competing with time for our own health] and who are women as well'.
	'Everyone, when I show up, they all thought I was the instructor. I had to say no, I'm a patient. I was with a lot of women who were in their 60s who were in their 70s, I was definitely the youngest by a few decades'.	'I think that virtual [programming] has opened up a lot of options, you can now have access to a lot of pre-recorded sessions. Education on periods and medications or things that are pretty standard for women and maybe a time where you could have a professional to answer some of the questions would be really impactful'.
Middle-aged (45–64 years)	'I was 55 and the average age of the people in my cohort was 70. So I just kind of felt like a fish out of water'.	'I think if there was an opportunity to just be with women, I think that would be comfortable. I think knowing that there's all women during a similar life stage, there's that commonality, you know, we're the same'.
		'Smaller groups based on the unique needs of the participants. We've got 50-year-old female with, vegetarian, good fitness level, we're going to put her over here. Then you know male age 65 overweight smoker we're going to put him over there and we're going to customize the program based on, these people'.
Older-aged (≥ 65 years)	'No there weren't barriers. I would say that weather and the time of day would be an impediment to some people, it wasn't to me because I'm an early riser'.	'The exercise programs, if I could have somebody who knew what they were doing and how to account for your other health problems like arthritis, to find ways for you to get your physical strength back. That would have been a major thing that I would have wanted'.
	'Obviously, you know, people who have families and have to find time to do it [Cardiac Rehabilitation]. My kids were older it wasn't a problem for me'.	'Women only schedules. In in group therapy or something with just other women. It might work for some women to be more comfortable that way'.
	'Women only schedules. In in group therapy or something with just other women. It might work for some women to be more comfortable that way'.	

CR - cardiac rehabilitation

Older participants emphasised the need for improved programme accessibility, including the expansion of CR services in more rural settings (e.g. in local community centres versus hospital-based) and improved parking infrastructure. They also expressed a desire for more education on managing comorbidities (e.g., musculoskeletal, pulmonary and mental health conditions) in addition to their CVD. P16 (Participant No 16) expressed:

I would like to have more options or education that work for my other comorbidities. And [recognition] that I'm not just a heart patient.

Table 2 presents selected quotes from interviews, organised by age group. These quotations illustrate the preferences for CR programming and barriers as described by younger, middle-aged, and older participants, providing important insights for future CR programme development.

DISCUSSION

This study highlights important barriers to and preferences for CR programmes among self-identifying women in Canada, differentiated by age. Participants' preferences align with previous calls to action to increase the representation of women in CR⁷, with the added consideration of participant age in CR programmes to improve inclusivity, promote a sense of belonging, and enhance comfort in attending and asking questions during CR education sessions. These considerations may potentially increase adherence among younger and middle-aged women, which is important given the growing prevalence of CVD in these age groups and the increased barriers experienced in attending CR.

CVD is increasing among younger and middle-aged adults; however, CR programmes (and education efforts) have been developed and are designed based on the needs of older adults. This is exemplified by our findings, as older-aged participants did not identify barriers to attending CR. Conversely, younger and middle-aged participants noted several barriers. This aligns with previous research on cited barriers to participation in CR, including distance to programme, transportation, family responsibilities, and discomfort during exercise²⁵. Alternate methods of delivery for CR programmes that reduce or eliminate these barriers were described as desirable by participants, including increasing virtual programme opportunities and offering programmes in more rural settings to decrease travel time. These possible solutions align with previous research highlighting the ways in which CR participation may be enhanced among underserved populations, such as women who are younger in age²⁶.

Women-only CR programmes that include education (e.g., medication effects on the menstrual cycle) and peer support specific to women were among the most common preferences for most participants in the younger and middle-aged groups. Efforts are being made to increase women-only CR offerings; however, to the best of our knowledge, only 7 women-only programmes exist in Canada²⁷. Furthermore, CR classes for those of similar age were described as a preference by many of these same participants. This demonstrates the need for current CR programmes to be updated and/or modified to be appealing and welcoming to younger individuals. Many interviewees expressed that they would be more comfortable asking questions during CR education sessions if they were in a group of similarly aged peers. These findings are an important step in recognising the unique needs and preferences for women at different life stages and modifying programmes accordingly to ensure all patients feel comfortable asking questions about their health. While our study did not examine the experiences of men, it suggests that age may be an important consideration in CR programme targeting all genders, pointing to an important avenue for future research.

The results of the current study should be interpreted with caution. Although a diverse sample of women was recruited to participate, the results may have reduced transferability to other contexts, given that the sample consisted of cisgender women, from only five of ten provinces in Canada. As well, participants were recalling their CR experience from 0 years to 10 years ago, and thus, these retrospective self-reports may have been subject to recall bias; however, these data provide novel insight into their lived experiences throughout recovery. Participants were predominantly Caucasian and English-speaking. It is well established that women with CVD are underserved in the CR space²⁶, but so are other minority groups, including but not limited to those of lower socio-economic status, non-English speakers, members of the 2SLGBTQIA+ community, and, as our results suggest, younger and

middle-aged women. The diversity in age (ranging from 25 years to 85 years) is an important strength of this work. CVD is increasing among younger women⁷, and efforts are needed to create more inclusive CR programmes that reflect the needs and recommendations of this demographic. Further research involving minority groups, (e.g. non-English speaking and 2SLGBTQIA+ populations) is needed to ensure that CR programmes are inclusive and accessible to all.

CONCLUSIONS

To meet the diverse needs of women recovering from a cardiac event, our findings recommend that CR programming be considerate of participants' age, life-stage, and the responsibilities associated with different life stages (e.g. young children, pursuing education, employment). Doing so may create a context in which women feel more comfortable and in which they feel their specific needs and interests are accounted for, which may in turn strengthen adherence. Future research is warranted, and improvements are required to ensure these programmes are relevant and inclusive to women of all ages.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Mehta PK, Gagnard S, Schwartz A, Manson JE. Traditional and emerging sex-specific risk factors for cardiovascular disease in women. *Rev Cardiovasc Med.* 2022;23(8):288. doi: [10.31083/j.rcm2308288](https://doi.org/10.31083/j.rcm2308288).
2. Cushman M, Shay CM, Howard VJ, Jiménez MC, Lewey J, McSweeney JC, et al. Ten-year differences in women's awareness related to coronary heart disease: results of the 2019 American Heart Association National Survey: a special report from the American Heart Association. *Circulation.* 2021;143(7):e239-e48. doi: [10.1161/CIR.0000000000000907](https://doi.org/10.1161/CIR.0000000000000907).
3. Bairey Merz CN, Andersen H, Sprague E, Burns A, Keida M, Walsh MN, et al. Knowledge, attitudes, and beliefs regarding cardiovascular disease in women: the Women's Heart Alliance. *J Am Coll Cardiol.* 2017;70(2):123-32. doi: [10.1016/j.jacc.2017.05.024](https://doi.org/10.1016/j.jacc.2017.05.024).
4. McDonnell LA, Turek M, Coutinho T, Nerenberg K, de Margerie M, Perron S, et al. Women's heart health: knowledge, beliefs, and practices of Canadian physicians. *J Womens Health (Larchmt).* 2018;27(1):72-82. doi: [10.1089/jwh.2016.6240](https://doi.org/10.1089/jwh.2016.6240).
5. Vikulova DN, Grubisic M, Zhao Y, Lynch K, Humphries KH, Pimstone SN, et al. Premature atherosclerotic cardiovascular disease: trends in incidence, risk factors, and sex-related differences, 2000 to 2016. *J Am Heart Assoc.* 2019;8(14):e012178. doi: [10.1161/JAHA.119.012178](https://doi.org/10.1161/JAHA.119.012178).

6. Ritchey MD, Wall HK, George MG, Wright JS. US trends in premature heart disease mortality over the past 50 years: where do we go from here? *Trends Cardiovasc Med.* 2020;30(6):364-74. doi: [10.1016/j.tcm.2019.09.005](https://doi.org/10.1016/j.tcm.2019.09.005).
7. Ghisi GLM, Marzolini S, Price J, Beckie TM, Mamataz T, Naheed A, et al. Women-focused cardiovascular rehabilitation: an international council of cardiovascular prevention and rehabilitation clinical practice guideline. *Can J Cardiol.* 2022;38(12):1786-98. doi: [10.1016/j.cjca.2022.06.021](https://doi.org/10.1016/j.cjca.2022.06.021).
8. Freene N, Hartono S, McManus M, Mair T, Tan R, Davey R. Validity of the Active Australia Survey in an Australian cardiac rehabilitation population. *J Sci Med Sport.* 2024;27(8):545-50. doi: [10.1016/j.jsams.2024.04.016](https://doi.org/10.1016/j.jsams.2024.04.016).
9. Garcia M, Mulvagh SL, Merz CN, Buring JE, Manson JE. Cardiovascular disease in women: clinical perspectives. *Circ Res.* 2016;118(8):1273-93. doi: [10.1161/CIRCRESAHA.116.307547](https://doi.org/10.1161/CIRCRESAHA.116.307547).
10. Khadanga S, Gaalema DE, Savage P, Ades PA. Underutilization of cardiac rehabilitation in women: Barriers and solutions. *J Cardiopulm Rehabil Prev.* 2021;41(4):207-13. doi: [10.1097/HCR.0000000000000629](https://doi.org/10.1097/HCR.0000000000000629).
11. Ghisi GLM, Kim W-S, Cha S, Aljehani R, Cruz MMA, Vanderlei LCM, et al. Women's cardiac rehabilitation barriers: results of the International Council of Cardiovascular Prevention and Rehabilitation's First Global Assessment. *Can J Cardiol.* 2023;39(11):S375-83. doi: [10.1016/j.cjca.2023.07.016](https://doi.org/10.1016/j.cjca.2023.07.016).
12. Vidal-Almela S, Czajkowski B, Prince SA, Chirico D, Way KL, Pipe AL, et al. Lessons learned from community- and home-based physical activity programs: a narrative review of factors influencing women's participation in cardiac rehabilitation. *Eur J Prev Cardiol.* 2021;28(7):761-78. doi: [10.1177/2047487320907748](https://doi.org/10.1177/2047487320907748).
13. Marçal IR, O'Neill CD, Hausen M, Mitra M, Visintini S, Reed JL. Sex-specific inclusion of patients with cardiovascular disease in exercise research in Canada. *CJC Open.* 2025;7(6):840-2. doi: [10.1016/j.cjco.2025.03.022](https://doi.org/10.1016/j.cjco.2025.03.022).
14. Burgess S, Zaman S, Towns C, Coylewright M, Cader FA. The under-representation of women in cardiovascular clinical trials: state-of-the-art review and ethical considerations. *Am Heart J.* 2025;282:81-92. doi: [10.1016/j.ahj.2024.12.011](https://doi.org/10.1016/j.ahj.2024.12.011).
15. Burgess SN. Understudied, under-recognized, underdiagnosed, and undertreated: sex-based disparities in cardiovascular medicine. *Circ Cardiovasc Interv.* 2022;15(2):e011714. doi: [10.1161/CIRCINTERVENTIONS.121.011714](https://doi.org/10.1161/CIRCINTERVENTIONS.121.011714).
16. Mamataz T, Ghisi GLM, Pakosh M, Grace SL. Nature, availability, and utilization of women-focused cardiac rehabilitation: a systematic review. *BMC Cardiovasc Disord.* 2021;21(1):459. doi: [10.1186/s12872-021-02267-0](https://doi.org/10.1186/s12872-021-02267-0).
17. Way KL, Reed JL. Meeting the needs of women in cardiac rehabilitation. *Circulation.* 2019;139(10):1247-8. doi: [10.1161/CIRCULATIONAHA.118.037754](https://doi.org/10.1161/CIRCULATIONAHA.118.037754).
18. Mamataz T, Ghisi GL, Pakosh M, Grace SL. Outcomes and cost of women-focused cardiac rehabilitation: a systematic review and meta-analysis. *Maturitas.* 2022;160:32-60. doi: [10.1016/j.maturitas.2022.01.008](https://doi.org/10.1016/j.maturitas.2022.01.008).
19. O'Neill CD, Vidal-Almela S, Terada T, Kamiya K, Tulloch HE, Pipe AL, et al. Sex and age differences in anxiety and depression levels before and after aerobic interval training in cardiac rehabilitation. *J Cardiopulm Rehabil Prev.* 2022;42(1):15-21. doi: [10.1097/HCR.0000000000000617](https://doi.org/10.1097/HCR.0000000000000617).

20. Lalande K, Bouchard K, Coutinho T, Mulvagh S, Pacheco C, Liu S, et al. The unique needs and challenges of young females after spontaneous coronary artery dissection. *J Cardiopulm Rehabil Prev.* 2025;45(3):192-9. doi: [10.1097/HCR.0000000000000929](https://doi.org/10.1097/HCR.0000000000000929).
21. Bradshaw C, Atkinson S, Doody O. Employing a qualitative description approach in healthcare research. *Glob Qual Nurs Res.* 2017;4:2333393617742282. doi: [10.1177/2333393617742282](https://doi.org/10.1177/2333393617742282).
22. Kiger ME, Varpio L. Thematic analysis of qualitative data: AMEE Guide No. 131. *Med Teach.* 2020;42(8):846-54. doi: [10.1080/0142159X.2020.1755030](https://doi.org/10.1080/0142159X.2020.1755030).
23. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3(2):77-101. doi: [10.1191/1478088706qp063oa](https://doi.org/10.1191/1478088706qp063oa).
24. Braun V, Clarke V. What can “thematic analysis” offer health and wellbeing researchers? *Int J Qual Stud Health Well-being.* 2014;9:26152. doi: [10.3402/qhw.v9.26152](https://doi.org/10.3402/qhw.v9.26152).
25. Sandesara PB, Lambert CT, Gordon NE, Fletcher GF, Franklin BA, Wenger NK, et al. Cardiac rehabilitation and risk reduction: time to “rebrand and reinvigorate”. *J Am Coll Cardiol.* 2015;65(4):389-95. doi: [10.1016/j.jacc.2014.10.059](https://doi.org/10.1016/j.jacc.2014.10.059).
26. Ades PA, Khadanga S, Savage PD, Gaalema DE. Enhancing participation in cardiac rehabilitation: focus on underserved populations. *Prog Cardiovasc Dis.* 2022;70:102-10. doi: [10.1016/j.pcad.2022.01.003](https://doi.org/10.1016/j.pcad.2022.01.003).
27. Ghisi GLM, Supervia M, Turk-Adawi K, Beleigoli A, Contractor A, Mampuya WM, et al. Women-focused cardiac rehabilitation delivery around the world and program enablers to support broader implementation. *CJC Open.* 2024;6(2):425-35. doi: [10.1016/j.cjco.2023.10.008](https://doi.org/10.1016/j.cjco.2023.10.008).