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Editorial

> *The world is on a bumpy journey to a new destination and*
> *the New Normal.*
> *— Mohamed El-Erian*

In one way or another, we have all been impacted by the 'Covid Chaos'! Many of you are frontline workers who have faced workplace challenges like never before, while others have been more indirectly affected by the social isolation, media Covid frenzy, and so much more! As we are all anxiously anticipating a 'new normal,' one thing is for sure: regardless of where you work, you will play a central role in leading the way to our new post-pandemic reality! Whether you are a clinician, researcher, or educator, you will continue to make a difference in cardiovascular nursing!

Recent CCCN membership survey results indicated that our members highly value and turn to the *Canadian Journal of Cardiovascular Nursing (CJCN)* to access information about cardiovascular nursing practice. We also received very positive feedback on our spring 2020 Women & Heart Health Across the Lifespan theme issue. We are committed to meeting your learning needs and hope you will continue to turn to the *Canadian Journal of Cardiovascular Nursing (CJCN)* for the evidence to inform your cardiovascular nursing practice. Therefore, I encourage you to contact us with suggestions for future feature articles, as well as ideas for our 2021 theme issue!

In the current issue, Audrey Lavoie and Véronique Dubé report on an intervention to reduce sedentary behaviour in elderly patients following cardiac surgery; Karine Légère and Ann Rhéaume evaluate an innovative strategy for fatigue in heart failure patients; and Asa Smith and Debra Barton review current evidence on the prevalence and severity of sexual dysfunction and sexual dissatisfaction in coronary artery disease.

Happy Reading!
Jo-Ann V. Sawatzky, RN, PhD
Editor, CJCN

Letters to the Editor

Dear Dr. Sawatzky,

Allow me to begin by offering congratulations to you and your editorial team. The *Canadian Journal of Cardiovascular Nursing (CJCN)* has been one of my "go to" journals for close to 20 years. The last year has brought exciting change to the journal. The manuscript quality is a testimony to the high standards set by you and your editorial board. The Spring 2020 issue of the CJCN was especially enjoyable. Women's Heart Health Across the Lifespan has both personal and professional meaning for all Canadian nurses.

I look forward to additional special issues and, as a nurse educator, I will continue to encourage my students to secure a CCCN membership. Membership has its benefits and unlimited access to current and past issues of the CJCN is just one of many.

Thank you to you and your team—your courage and commitment to CCCN is very much appreciated.

With courage,

Susan Morris RN BN MEd CNCC(C) CCN(C)

Susan Morris, RNBN, Med,
CNCC(C), CCN(C)
Past President CCCN, Director of
Conference Planning CCCN

Dear Dr. Sawatzky and Editorial Team,

Congratulations on the special CJCN edition, "Women's Heart Health Across the Life Span." An exemplary edition such as this, not only brings excellent visibility to the journal, but permits timely access to important research that underpins evidence-based practice in cardiovascular nursing. This edition specifically focused on cardiovascular conditions and relevant issues that impact the cardiovascular health of women. It is a great read.

The article by Banner et al. highlighted the impact of cardiometabolic risk that women encounter in the context of a rare congenital condition known as adrenal hyperplasia. The article outlines a proactive approach to provide supports tailored for women with this condition. Increasing our knowledge of cardiovascular disease (CVD) in women is imperative not only for women affected by CVD, but more so for nurses who regularly treat them in practice. The cross-sectional study conducted by Gujral et al. in this special edition, examined female nurses' perceptions of their risk of CVD. Interestingly, Gujral and colleagues found, in order to start reducing the risk of CVD by engaging in healthy behaviour, women needed to have accurate perception of their level of CVD risk. The paper on SCAD-spontaneous coronary artery dissection-an occurrence not so rare in women, as once thought, is an area of research that is emerging. Shocking statistics brought to light by this review by Macdonald reported that 25% of all acute coronary syndromes in women younger than 60 are related to SCAD and is responsible for 90% of acute myocardial infarctions in healthy young women. The edition ends with colleague Wendy Wray sharing her story of the development of a nurse-led primary preventative care project called the Montreal-based Women's Heart Health Initiative.

If you haven't read this edition, I urge all to do so, it is an engaging read and particularly relevant to current cardiovascular nurses working in all areas of practice.

Thank you for providing access to excellent research conducted across Canada and published in the Canadian Journal of Cardiovascular Nursing. This high quality of evidence-based research is essential to cardiovascular health care professionals keeping members informed whether in practice, education or research.

Looking forward to the next special edition.

Kind regards,

Sheila O'Keefe-McCarthy

Sheila O'Keefe-McCarthy, RN, PhD
Associate Professor/Brock
University

Home-Based Motivational Interviewing Nursing Intervention to Reduce Sedentary Behaviour Among Elderly Persons Following Coronary Artery Bypass Surgery: A Pilot Study

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Abstract

Background: *As the population ages and more elderly individuals are undergoing coronary artery bypass graft surgery (CABG), there is a growing need to focus on reducing sedentary behaviour following this surgery to prevent morbidity and mortality.*

Objective: *This pilot study sought to qualitatively evaluate the acceptability, feasibility, and outcomes of a motivational interviewing nursing intervention (MINI) for reducing sedentary behavior in elderly persons following CABG (N = 5).*

Method: *The MINI consisted of five weekly, home-based sessions. Based on semi-structured interviews, notebook of physical activity, algorithm of stage of change, and logbook entries, we completed descriptive statistics and a thematic analysis.*

Results: *The MINI appeared to be acceptable and feasible for the post-CABG elderly, as they progressed through the stages of change and reduced sedentary behaviour.*

Conclusion: *Despite the need for more research, our findings suggest that a nurse-led, home-based, post-CABG intervention may support the promotion of physical activity behaviours in the elderly.*

Key words : aged, motivational interviewing, nursing interventions, coronary artery bypass surgery, behavioral changes

Lavoie, A., & Dubé, V. (2020). Home-Based Motivational Interviewing Nursing Intervention to Reduce Sedentary Behaviour Among Elderly Persons Following Coronary Artery Bypass Surgery: A Pilot Study. *Canadian Journal of Cardiovascular Nursing*, *30*(2), 4–12.

Key highlights

- Attendance in cardiac rehabilitation programs by the elderly post-CABG is reportedly poor.
- The results of our home-based motivational interviewing nursing intervention suggest that it is acceptable and feasible, and may reduce sedentary behaviour in this population
- There is a need to continue to develop and evaluate nursing interventions for health promotion that are accessible and adapable to the needs of elderly persons following CABG.

Background

The number of elderly individuals (i.e., 65 years and older) around the world is expected to double in the next 30 years (World Health Organization, 2018). As they age, the elderly are increasingly affected by chronic illnesses, including coronary heart disease (CHD) (Public Health Agency of Canada, 2017). Coronary artery bypass graft surgery (CABG) is one of the possible treatments for this disease. However, this surgical procedure must be followed by secondary prevention strategies aimed at reducing cardiovascular risk factors (i.e., obesity, smoking, sedentariness, hypertension, diabetes, high blood pressure, high blood cholesterol, poor diet) in order to lower the risk of another coronary event (Artinian et al., 2010; Perk et al., 2012). The elderly represent the most sedentary age group (Hallal et al., 2012; Harvey et al., 2013); therefore, it is especially important to focus on reducing sedentary behaviour in this population. Importantly, increasing physical activity after CABG may have positive health effects, including reduced morbidity and mortality (Kuo et al., 2016; Perk et al., 2012; Sattelmair et al., 2011). While all CABG patients should enroll in a cardiac rehabilitation program to reduce cardiovascular risk factors (Perk et al., 2012), attendance in these programs is poor (Kuo et al., 2016; Martin et al., 2012). Moreover, the elderly represent the group that participates least in these programs (Martin et al., 2012; Sumner et al., 2016), in particular due to accessibility problems (Grace et al., 2009).

Nurses are the ideal healthcare professionals to coordinate secondary prevention interventions, because of their focus on health promotion and disease prevention (Canadian Public Health Association, 2010). Their role includes supporting the elderly in the adoption of healthy behaviours. One of the strategies that nurses can use to elicit behavioural change is motivational interviewing (MI) (van Nes & Sawatzky, 2010). Motivational interviewing is a person-centred counselling approach that involves engaging the person in collaborative conversations to stimulate intrinsic motivations to change (Miller & Rollnick, 2013). Motivational interviewing is related to the transtheoretical model (TTM) (Prochaska & DiClemente, 1984), which describes the process of behavioural change. Used together, these two models enable nurses to support individuals through a behavioural change, while respecting their progress through the stages of change (van Nes & Sawatzky, 2010).

Several researchers have found that MI results in behavioural change in individuals with cardiovascular risk factors (Lee et al., 2016; Thompson et al., 2011), and specifically in the elderly (Arkkukangas et al., 2017; Cummings et al., 2009; Lilienthal et al., 2014; Purath et al., 2014). However, to our knowledge, no study has examined an MI intervention for sedentary elderly persons following CABG, even though it could be beneficial in helping them to reduce their sedentary behaviour. Since the literature describes a wide range of MI interventions, it is difficult to determine which specific components (e.g., content and structure) will optimize changes and be beneficial for this particular population (Lee et al., 2016). In addition, few studies have examined how the elderly perceive the various components of the MI interventions (Arkkukangas et al., 2017). However, researchers have found that the elderly appreciate having local services (Grace et al., 2009; Tolmie et al., 2009), and the opportunity to exercise at home (Arkkukangas et al., 2017).

Therefore, the purpose of this pilot study was to qualitatively assess the acceptability, feasibility, and outcomes of a home-based MI nursing intervention (MINI) to reduce sedentary behaviour in elderly individuals following CABG. Accordingly, we addressed the following three research questions: (1) How do sedentary elderly persons following CABG perceive the acceptability of the MINI in terms of its content and structure (intensity, mode of delivery, location)? (2) What is the feasibility of the intervention in terms of recruitment, adherence, and fidelity to the intervention, among sedentary elderly persons following CABG? and (3) What are the outcomes of the intervention in terms of progress through the stages of change and reduced sedentary behavior in a group of elderly persons following CABG?

Methods

Design

We conducted a pilot study with a descriptive, qualitative design to evaluate the acceptability (i.e., content and structure), feasibility (i.e., recruitment, adherence, and fidelity) and outcomes (i.e., stages of change and sedentary behaviour) of the MINI to reduce sedentary behaviour in elderly individuals following CABG. The study received the approval of the Faculty of Nursing Scientific Research Committee at the Université de Montréal and was approved by the hospital's ethics committee (#17270).

Conceptual Models

The MI counselling approach (Miller & Rollnick, 2013) and the TTM (Prochaska & DiClemente, 1984) were used as the theoretical underpinnings of this study. These models served as guides in the development of the content and structure, as well as the evaluation of the study intervention. The MI counselling approach represents a form of collaborative discussion with the individual, which is aimed at resolving ambivalence towards change. The MI technique is based on four principles: (1) avoid the righting reflex; (2) listen with empathy; (3) explore intrinsic motivations; and (4) encourage self-efficacy (Miller & Rollnick, 2013). Applying these principles evokes the individual's drive for change, which is conducive to maintaining change. According to Miller and Rollnick (2013), there are four phases to the MI process: (1) engagement in the relationship; (2) focus; (3) evocation; and (4) planning.

The central concept in the TTM is that behaviour change is based on the indvidual passing through a series of six stages of change (i.e., precontemplation, contemplation, preparation, action, maintenance, and relapse). In the precontemplation stage, the individual is not thinking about changing. Contemplation is the stage during which individuals recognize that they have a problem and are seriously thinking about changing, but are not yet committed to doing so. These individuals may undertake a change within six months. During the preparation stage, the individual is convinced of the benefits of the change and will initiate the change process within the next month. In the action stage, the individual has initiated a change in the last six months. The maintenance stage is defined as maintaining the change for more than six months. The relapse stage occurs when individuals return to their original behaviours.

Used together, the MI technique and TTM optimize the individual's drive for change within the context of one's stage of change (van Nes & Sawatzky, 2010). Based on the core principles of the nursing discipline, all nursing interventions must encompass respect for the indiviual's experience and uniqueness (Pepin et al., 2017). Thus, combining these two models in an intervention aligns with core principles of nursing, since this enables nurses to support behavioural change in a way that targets the needs of individuals while respecting their progress in the change process.

Intervention

Based on a previous study (Hardcastle et el., 2013), the intervention included five weekly MI sessions. These sessions were provided by a nurse who had been trained in MI by attending an eight-hour MI workshop, organized by Quebec's professional Order of Nurses (i.e., The Ordre des infirmières et infirmiers du Québec). The nurse delivered the MI sessions in French in the participant's home, with each session lasting between 30 and 45 minutes. The content of the intervention was directed at supporting the person in the process of behavioural change, within the context of MI. In general, the nurse explored the participant's motivation to change and the advantages and disadvantages of the change, as well as the barriers experienced and strategies for overcoming these barriers.

The intervention was structured according to the four phases of MI outlined by Miller and Rollnick (2013). During phase one (i.e., engagement in the relationship), the nurse sought to initiate and maintain a relationship of trust with the participant. In phase two (i.e., focus), the nurse clarified the purpose of the session with the participant. In phase 3 (i.e., evocation), the nurse used the MI principles to facilitate the participant's expression of motivations for change. The fourth phase (i.e., planning) was initiated when the nurse felt that sufficient motivation for change had been established. During this phase, the nurse encouraged the participant to express a specific plan for change, and then, working together, they developed an action plan for integrating physical activity.

The intervention was also structured according to the participants' stage of change (Bédard, 2009; Prochaska & DiClemente, 1984). For example, if participants were in the precontemplation stage of change, the nurse intervened by trying to increase their conviction for change with strategies such as encouraging the participant to express the benefits of the change with open-ended questions (e.g., What would be the benefits of starting to be more active every day?). For participants in the action stage of change, the nurse intervened by trying to increase their confidence and maintain their conviction by encouraging, valuing, and reinforcing change and preventing relapse (e.g., How do you think you can prevent a relapse?).

Sample and Setting

Participants were recruited during their hospitalization for CABG at a university hospital in Montreal, Canada. The inclusion criteria were as follows: (1) 65 years of age or older; (2) hospitalized for CABG; (3) affirms spending eight hours or more per day in sedentary activities (e.g., reading a book, watching television, browsing the Internet); (4) agrees to take part in the study within three months post-discharge; (5) a desire to become more active; (6) understanding, speaking, and reading French; (7) no contraindication to engaging in physical activity (as per their medical records); (8) no diagnosed or presumed neurocognitive disorder (as per their medical records) and claims to be sufficiently fluent in French to be able to respond to a questionnaire, communicate by telephone, and read and sign the consent form; and (9) residing within 60 km of the hospital. The exclusion criterion was previous participation in a cardiac rehabilitation program or another similar program.

Recruitment Procedures

The first author conducted a review of the medical records of hospitalized CABG patients to identify those who met the first three inclusion criteria (i.e., age, diagnosis, proximity to hospital). Individuals who met the initial study criteria were approached by the first author at the bedside to confirm their eligibility by asking them questions about their sedentary behaviour and interest in taking part in the study (N = 35). The patients who were eligible and agreed to take part in the study (N = 10) were given a pamphlet explaining the study. These individuals were contacted by telephone in the weeks following their discharge from hospital to organize an initial intervention session in their home. Five participants consented to and participated in the study.

Measures

The measurement instruments for this study were selected specifically for the purpose of addressing the three research questions. Accordingly, we measured acceptability, feasibility, and outcomes of the MINI.

To collect data on acceptability (i.e., Research Question #1), semi-structured telephone interviews were conducted in the week following the completion of the intervention. The interviews were standardized through the use of an interview guide developed by the researchers and included six questions, with 16 sub-questions to ascertain the participants' general appraisal of the study (e.g., What is your overall impression of the project in which you participated?), as well as their perceptions of the intervention's content (e.g., What did you think of the content of the meetings with the nurse?), and structure (e.g., What did you think of the meeting place?). To prevent bias, these telephone interviews were conducted by a research assistant who was not otherwise involved in the study.

To evaluate feasibility (i.e., Research Question #2), with permission of the participants, all of the MINI sessions were recorded. The first author listened to each of the recordings and made entries in a logbook, noting any relevant thoughts on the intervention, and entered information on any discrepancies between the intervention's content (e.g., interventions carried out by the nurse based on the MI phases and the stages of change) and structure (e.g., intensity, mode of delivery, location) as it had been planned, compared to the intervention as administered.

An algorithm evaluating stages of change (Paradis et al., 2010) was adapted to the present study, with permission, to measure outcomes (i.e., Research Question #3) and used at each session (see Figure 1). No psychometric properties

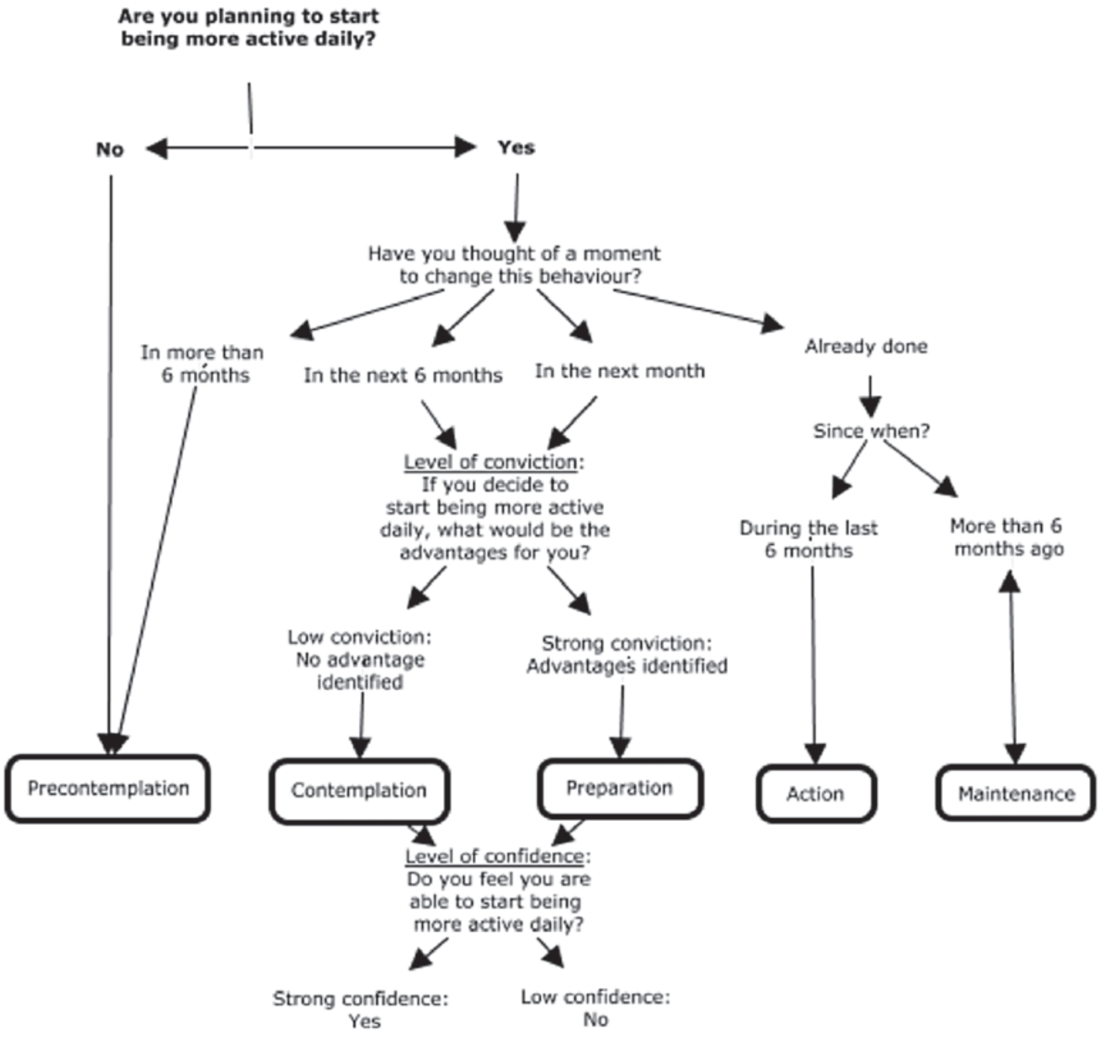

Figure 1. Algorithm for Evaluating Stages of Change and Levels of Conviction and Confidence
Note: From "The efficacy of a motivational nursing intervention based on the stages of change on self-care in heart failure patients," by V. Paradis, S. Cossette, N. Frasure-Smith, S. Heppell, and M. C. Guertin, 2010, Journal of Cardiovascular Nursing, 25, p. 136. Copyright 2010 by Lippincott Williams & Wilkins. Adapted with permission.

of this tool are reported in the literature, but its content has been validated by a clinical nurse specialist and a nurse practitioner specialized in MI and TTM in another study (Paradis et al., 2010). This tool consists of a series of questions about the participant's desire to initiate a change. Based on the responses, it is possible to determine the participant's current stage of change.

The participants were also asked to maintain a notebook on the type and duration of their physical activity between the sessions. Examples of physical activity and intensity were provided (e.g., light physical activity: slow walking, low-speed cycling, social dancing [slow], stretching; moderate physical activity: walking, cycling or fast swimming, water aerobics, washing the car, dancing, gardening, going up/down stairs; intense physical activity: walking, cycling or swimming at high speed, running, climbing a hill, aerobics; Canadian Society for Exercise Physiology, 2011).

Lastly, a questionnaire was used to collect sociodemographic data and to establish a profile of the participants (e.g., age, sex, income, civil status, cardiovascular risk factors, and level of physical activity prior to hospitalization).

Data Analysis

A thematic analysis, following the method proposed by Paillé and Mucchielli (2016), was performed to analyze the logbook data and the semi-structured interviews. The first author recorded, transcribed verbatim, and listened to these interviews several times. Low-interference themes (i.e., those directly related to the participants' comments) were identified and annotated in the margins of the text using Qualitative Data Analysis (QDA) Miner® software. The second author then validated all the themes. Lastly, we calculated descriptive statistics (i.e., averages and percentages) to evaluate outcomes in terms of the participants' progress through the stages of change, as well as their level of physical activity.

Scientific Criteria

To ensure that the study would be conducted with scientific rigor, we considered credibility, reliability, validity, and transferability criteria. We took care to maintain the credibility of the data triangulation by using four data collection tools (Polit & Beck, 2017). We ensured data reliability by developing an in-depth description of the study sample by recording and replaying the interviews and MINI sessions, and by taking field notes in a logbook following each session (Guba & Lincoln, 1989). We ensured the validity of the data by the process of validating the themes by the second author so that the data would be neutral and objective. Lastly, we developed a detailed description of the study's process, and the intervention's content and structure to ensure transferability (Polit & Beck, 2017).

Results

The results are presented according to the sequence of data collection to include the characteristics of the participants, the data on acceptability (i.e., content and structure), the data on feasibility (i.e., recruitment, adherence, and fidelity), and the outcomes of the MINI on sedentary behaviour and stages of change.

Characteristics of the Sample

Five individuals participated in this study. The sample included four men and one woman, all retired Canadian citizens, with an average age of 74.2 years. Four participants had a high-school diploma and one had completed primary studies. Three of the participants lived with a spouse, and two lived alone. The five participants entered the study between one and three months following hospital discharge post-CABG. Three participants had been diagnosed with Type 2 diabetes, two suffered from hypertension, one presented with hypercholesterolemia, one was obese, one had chronic obstructive pulmonary disease and osteoarthrosis, and two were experiencing stress. Prior to their hospitalization for CABG, the participants reported that they were spending an average of 3.1 hours per week in light physical activity, and 0.2 hour per week in moderate physical activity. None of them had engaged in prior intense physical activity.

Acceptability

Findings of the semi-structured interviews are presented according to the evaluation of the acceptability of the MINI (i.e., participants' perception of the content and structure).

Content. In general, the analysis of the post-intervention semi-structured interviews demonstrated that the participants considered the intervention to be acceptable. All participants stated that they were satisfied, and all would have agreed to participate again if given the opportunity. Two major themes emerged related to their perceptions of the content: (1) the support they received for behavioural change; and (2) their motivation. The weekly encouragement by the nurse was seen as helpful to their personal change process, for example:

> *"Each time that there was progress, she (the nurse) was pleased, she congratulated me on the effort I was making. For me, these were the most useful aspects. Because it encouraged me to carry on and do a bit more." [translation] (P4)*

They appreciated that the support they received for change was respectful of their personal change process (e.g., they were not pushed, and it was understood that there may be relapses). In addition, the participants' comments revealed their increased motivation to engage in physical activities following the intervention. For some, this motivation was tied to setting personal objectives each week, and to discovering new physical activities. Furthermore, the participants were motivated to increase their level of physical activity week by week, maintain this change, and see the physical and emotional benefits of their behaviour change.

Structure. Most of the participants (n = 4) affirmed that the five sessions were sufficient. All participants felt that the length of the sessions (χ = 38.94 minutes, S.D. = 30–45) was satisfactory, and provided sufficient time for discussion.

The participants were unanimous in their appreciation of the face-to-face, at-home mode of the intervention delivery, mentioning the difficulties they would have had in going to a centre-based intervention due to their recent health experience (i.e., post-CABG). The once-weekly frequency of the intervention was also described as appropriate, as it gave the participants time to engage in physical activities between the sessions and to have weekly support for their efforts. However, the participants expressed a range of different perceptions of the intervention's timing post-discharge, and this timing seemed to have an impact on their behavioural change. For example, one participant was ready to begin behavioural change upon returning home from the hospital, while another spoke of problems experienced making a change after a hospitalization.

Feasibility. Results of the feasibility of the MINI in terms of recruitment, adherence, and fidelity, based on the nurse's logbook entries, are presented in this section.

Recruitment. Between February and April, 2018, we met with a total of 35 potential participants hospitalized for CABG. Of this group, 20 (57%) did not meet the sedentary criterion. Of the remaining 15 patients who were eligible to take part in the study, five were not interested in taking part and another five dropped out for health-related reasons (e.g., post-CABG complications, severe pain, extended stay in a convalescent home). Ultimately, five individuals (14%) agreed to take part in the study. The recruiting process was complex due to several organizational changes, including a move to new facilities that was underway during recruitment. The overall CABG patient hospitalization rate was also unusually low during this period, which reduced the number of potential participants.

Adherence. All participants completed the five MINI sessions. The majority of the participants (n = 4) completed their physical activity journal each week, while one needed help completing journal entries during sessions with the nurse. Among the change objectives identified by the participants each week (e.g., going for two 10-minute walks each day, climbing up and down a flight of stairs three times per week), only 60% were achieved. Typical barriers identified included pain, fatigue, shortness of breath, and poor weather.

Fidelity. Of the 25 MINI sessions provided during the study, intervention fidelity was achieved in 18 sessions (72%). Thus, the intervention was carried out as planned, except for seven sessions during which minimal components of the protocol were not accomplished (i.e., the session was shorter or longer than it should have been; more than a week passed between sessions; and no evaluations were made of the stage of change).

Outcomes

Key study outcomes included progress through the stages of change and changes in sedentary behaviour. All participants made progress in terms of advancing through the stages of change. More specifically, three of the participants advanced by one stage and two advanced by two stages. At their first session, three participants were in the contemplation stage and two were in the preparation stage. By the last session, four participants were in the action stage (i.e., had begun to change their sedentary behaviours) and only one participant was in the preparation stage.

The results related to progress through the stages of change were congruent with the changes in the participants' sedentary behaviours (see Figure 2). Even though the participants had varied baseline levels of physical activity, all participants increased their physical activity over the course of the study. Only Participant 1 showed a minimal increase in level of physical activity, and Participant 5 experienced a slight decrease in level of physical activity in the fifth week due to illness-related symptoms (i.e., pain, fatigue). In short, these results suggest that all the participants advanced in their stages of change and reduced their sedentary behaviours through overall increased levels of physical activity during the course of this study.

Discussion

The purpose of this pilot study was to qualitatively evaluate the acceptability, feasibility, and outcomes of a home-based MINI for sedentary elderly individuals following

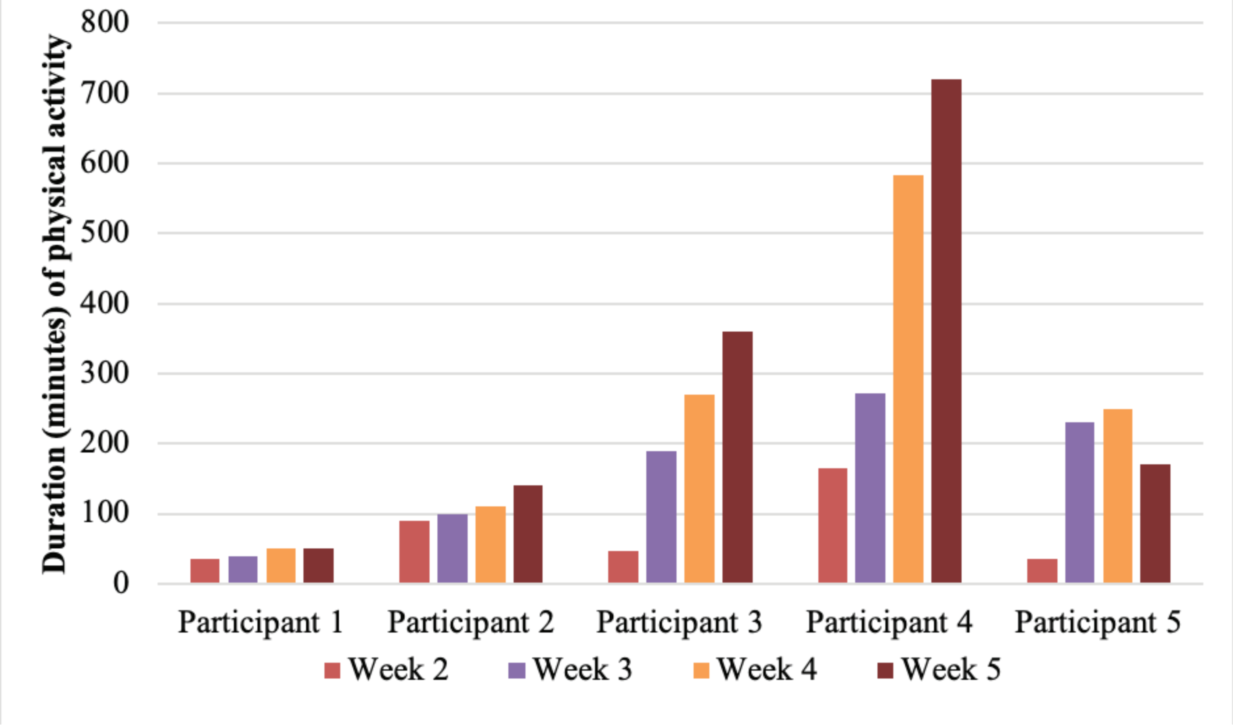

Figure 2. Duration of Physical Activities Performed Each Week (*n* = 5).

CABG. The results suggest that the intervention is acceptable and feasible for this population It may also encourage their progress through the stages of change and facilitate reduction in sedentary behaviour through physical activity.

The results of this study are consistent with other studies in which participants reported that the content of MI sessions is beneficial (Arkkukangas et al., 2017; Brobeck et al., 2014), and that MI is an appropriate strategy to facilitate progress through the stages of change (Brodie et al., 2008; Lilienthal et al., 2014), and to increase levels of physical activity in the elderly population (Lilienthal et al., 2014; Rasinaho et al., 2011; Song et al., 2014). Since lack of motivation is a major barrier to increasing levels of physical activity in the elderly (Costello et al., 2011; Franco et al., 2015), our findings suggest that a MINI may be one way to meet their needs. Despite the small sample size, the results of this study make a valuable contribution to the limited evidence about the components of MI interventions leading to optimal changes (Lee et al., 2016). These results also concur with the findings of another study, which reported that a low-intensity MI intervention can, indeed, result in an increase in physical activity, and that this change tends to be even greater when the number of sessions is increased to five (Hardcastle et al., 2013). However, these findings will need to be verified with further research, to include larger sample sizes, and possibly a randomized controlled trial with a MINI intervention. Further studies are also needed to evaluate if the behavioural changes are maintained over time (Lee et al., 2016).

In addition, since the intervention was structured within the context of the MI phases and stages of change, as well as in-home sessions, the MINI appears to be a promising intervention for effecting change related to sedentary behaviour in post-CABG elderly population. Although several researchers have reportedly used the stages of change to measure the progress made by their participants, they do not indicate if the intervention was adapted to the participants' stage of change (Brodie et al., 2008; Lilienthal et al., 2014). However, structuring the intervention as a combination of these two models is a favourable solution, since this provides participants with support that is based on their state of preparedness for change (Paradis et al., 2010; van Nes & Sawatzky, 2010). The results of our study also suggest that this intervention structure may have contributed to our participants feeling respected in their process of behavioural change. Finally, to our knowledge, only two studies have examined an entirely face-to-face home-based MI intervention with elderly participants (Brodie et al., 2008; Goodman et al., 2008). In contrast to one of these two studies where the researchers experienced feasibility difficulties related to the longer duration of the home-based intervention (Brodie et al., 2008), our results demonstrate that a home-based MINI with the elderly is feasible in respecting the expected duration.

Consistent with previous research (Arkkukangas et al., 2017), our elderly study participants appreciated the home-based intervention because it was accessible and adapted to their health experience following CABG. However, while home-based interventions may meet the needs of an aging population (Canadian Nurses Association, 2012), they are also costly. Therefore, creative alternatives that include advanced health-related technologies, such as web-based and telehealth interventions should be explored.

The results of this study suggest that a nurse-led, home-based MI intervention has the potential to encourage reduction of elderly individuals' sedentary behaviour following CABG. Nurses working in the areas of health promotion and disease prevention should consider seizing opportunities to develop their knowledge of MI and TTM. Given the increasing prevalence of chronic diseases in the elderly, acquiring these skills may enable nurses to motivate and support their patients to adopt healthy behaviours and improve their health outcomes. Community-based nurses are also ideally situated to identify potential innovative strategies that integrate MI and TTM to meet the health promotion needs of their elderly clients, particularly following CABG.

This study contributes to the existing literature by offering a MINI to a client group that, to our knowledge, has never before received this type of intervention. Therefore, recommendations for future nursing research include a focus on continuing to develop and evaluate MINIs that may meet the needs for behavioural change in specific groups, such as the elderly. Based on our experience, we also support research that includes MI trained health professionals to deliver these interventions (Lee et al., 2016; VanBuskirk & Wetherell, 2014). In particular, nurses are ideal candidates to deliver MI interventions due to their health promotion, communication, and relational expertise (Lee et al., 2016; van Nes & Sawatzky, 2010).

Limitations

This study had several limitations. First, and foremost, we were only able to recruit five participants. Although it was a pilot study with a qualitative design, this small sample limits the generalizability, and possibly, the reproducibility of the results. Therefore, further research, with strategies to ensure a larger sample size, is needed. However, the findings demonstrated convincing trends and lend support for previous research in this area. Second, the participants were recruited in only one hospital, thus also limiting the generalizability of the findings. Third, the nurse who conducted the intervention was also the lead investigator. We reduced this potential for bias by having an external interviewer conduct the semi-structured interviews used to evaluate participants' perceptions of the intervention. Furthermore, we recorded each MI session and then listened to it again, completing an intervention fidelity table (Polit & Beck, 2017). The second author was also involved in the analysis to ensure data neutrality (Creswell, 2014). Finally, our measurement instruments had several limitations, including a self-report measure of physical activity and a non-validated algorithm for stages of change. Although our results did show important trends, more rigorous measures should be considered in future research.

Conclusion

Given the global phenomenon of an aging population, the prevalence of CHD and consequent increasing CABG in this population, and the accessibility issues that the elderly experience with centre-based programs, it is essential to explore new and innovative secondary prevention interventions that address the specific needs of the elderly population. This pilot study assessed the acceptability, feasibility, and outcomes of a home-based MINI for elderly individuals following CABG. Although this was a small study, the findings suggest that a home-based MINI may be acceptable and feasible for elderly persons following CABG, to foster their progress through the stages of change, and help reduce their sedentary behaviour. Therefore, nurses working with this population should consider developing their MI and TTM skills as a strategy to support elderly individuals in adopting healthy behaviours. Finally, while this pilot study provides important foundational evidence, more studies are needed to evaluate the results on a larger scale, and future research should focus on maintaining long-term behaviour change.

REFERENCES

Arkkukangas, M., Sundler, A., Söderlund, A., Eriksson, S., & Johansson, A.-C. (2017). Older persons' experiences of a home-based exercise program with behavioral change support. *Physiotherapy Theory and Practice, 33*(12), 905–913. https://doi.org/10.1080/09593985.2017.1359869

Artinian, N. T., Fletcher, G. F., Mozaffarian, D., Kris-Etherton, P., Van Horn, L., Lichenstein, A. H., Kumanyika, S., William E. Kraus, W. E., Fleg, J. L., Redeker, N. S., Meininger, J. C., Banks, J., Stuart-Shor, E. M., Fletcher, B. J., Miller, T. D., Hughes, S., Braun, L. T., Kopin, L. A., Berra, K., . . . Burke, L. E. (2010). Interventions to promote physical activity and dietary lifestyle changes for cardiovascular risk factor reduction in adults: A scientific statement from the American Heart Association. *Circulation, 122*, 406–441. https://doi.org/10.1161/CIR.0b013e3181e8edf1

Bédard, J. (2009). *3 Minutes pour changer un comportement*. http://www.lemieuxbedard.com/emc/files/3_Minutes_pour_changer_un_comportement.pdf

Brobeck, E., Odencrants, S., Bergh, H., & Hildingh, C. (2014). Patients' experiences of lifestyle discussions based on motivational interviewing: A qualitative study. *BioMed Central Nursing, 13*, 1–7. https://doi.org/10.1186/1472-6955-13-13

Brodie, D. A., Inoue, A., & Shaw, D. G. (2008). Motivational interviewing to change quality of life for people with chronic heart failure: A randomised controlled trial. *International Journal of Nursing Studies, 45*(4), 489–500. https://doi.org/10.1016/j.ijnurstu.2006.11.009

Canadian Nurses Association. (2012). *A nursing call to action—The health of our nation, the future of our health system*. https://www.cna-aiic.ca/~/media/cna/files/en/the_costs_performance_canadas_health_system_e.pdf?la=en

Canadian Public Health Association. (2010). *La pratique infirmière en santé publique ~ en santé communautaire au Canada*. https://www.cpha.ca/sites/default/files/assets/pubs/3-2bk04214.pdf

Canadian Society for Exercise Physiology. (2011). *Directives canadiennes en matière d'activité physique.* http://www.csep.ca/CMFiles/directives/PAGuidelinesGlossary_FR.pdf

Costello, E., Kafchinski, M., Vrazel, J., & Sullivan, P. (2011). Motivators, barriers, and beliefs regarding physical activity in an older adult population. *Journal of Geriatric Physical Therapy, 34*(3), 138–147. https://doi.org/10.1519/JPT.0b013e31820e0e71

Creswell, J. W. (2014). Research design. (4e éd.). SAGE Publications.

Cummings, S. M., Cooper, R., & Cassie, K. (2009). Motivational interviewing to affect behavioral change in older adults. *Research on Social Work Practice, 19*, 195–204. https://doi.org/10.1177/1049731508320216

Franco, M. R., Tong, A., Howard, K., Sherrington, C., Ferreira, P. H., Pinto, R. Z., & Ferreira, M. L. (2015). Older people's perspectives on participation in physical activity: A systematic review and thematic synthesis of qualitative literature. *British Journal of Sports Medicine, 49*, 1268–1276. https://doi.org/10.1136/bjsports-2014-094015

Goodman, H., Parsons, A., Davison, J., Preedy, M., Peters, E., Shuldham, C., Pepper, J., & Cowie, M. R. (2008). A randomised controlled trial to evaluate a nurse-led programme of support and lifestyle management for patients awaiting cardiac surgery 'Fit for surgery: Fit for life' study. *European Journal of Cardiovascular Nursing, 7*(3), 189–195. https://doi.org/10.1016/j.ejcnurse.2007.11.001

Grace, S. L., Shanmugasegaram, S., Gravely-Witte, S., Brual, J., Suskin, N., & Stewart, D. E. (2009). Barriers to cardiac rehabilitation: Does age make a difference? *Journal of Cardiopulmonary Rehabilitation and Prevention, 29*(3), 183–187. https://doi.org/10.1097/HCR.0b013e3181a3333c

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Sage Publication.

Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., & Ekelund, U. (2012). Global physical activity levels: Surveillance progress, pitfalls, and prospects. *Lancet, 380*(9838), 247–257. https://doi.org/10.1016/s0140-6736(12)60646-1

Hardcastle, S. J., Taylor, A. H., Bailey, M. P., Harley, R. A., & Hagger, M. S. (2013). Effectiveness of a motivational interviewing intervention on weight loss, physical activity and cardiovascular disease risk factors: A randomised controlled trial with a 12-month post-intervention follow-up. *International Journal of Behavioral Nutrition and Physical Activity, 10*(40), 1–16. https://doi.org/10.1186/1479-5868-10-40

Harvey, J. A., Chastin, S. F. M., & Skelton, D. A. (2013). Prevalence of sedentary behavior in older adults: A systematic review. *International Journal of Environmental Research and Public Health, 10*(12), 6645–6661. https://doi.org/10.3390/ijerph10126645

Kuo, L., Lin, Y., Ling, W. S., YL, L., Huang, H., Tsai, H., Cheng, F. H., Hsu, C. L., Chen, B. Y. (2016). Effect of cardiac rehabilitation on cardiovascular events after coronary artery bypass grafting in a 6-year follow-up study. *Health Science Journal, 10*(3). www.hsj.gr/archive

Lee, W. W., Choi, K. C., Yum, R. W., Yu, D. S., & Chair, S. Y. (2016). Effectiveness of motivational interviewing on lifestyle modification and health outcomes of clients at risk or diagnosed with cardiovascular diseases: A systematic review. *International Journal of Nursing Studies, 53*, 331–341. https://doi.org/10.1016/j.ijnurstu.2015.09.010

Lilienthal, K. R., Pignol, A. E., Holm, J. E., & Vogeltanz-Holm, N. (2014). Telephone-based motivational interviewing to promote physical activity and stage of change progression in older adults. *Journal of Aging and Physical Activity, 22*(4), 527–535. https://doi.org/10.1123/japa.2013-0056

Martin, B. J., Hauer, T., Arena, R., Austford, L. D., Galbraith, P. D., Lewin, A. M., Knudtson, M. L., Ghali, W. A., Stone, J. A., Aggarwal, S. G. (2012). Cardiac rehabilitation attendance and outcomes in coronary artery disease patients. *Circulation, 126*(6), 677–687. https://doi.org/10.1161/CIRCULATIONAHA.111.066738

Miller, W. R., & Rollnick, S. (2013). *L'entretien motivationnel : aider la personne à engager le changement.* (2e éd.). InterEditions.

Paillé, P., & Mucchielli, A. (2016). *L'analyse qualitative en sciences humaines et sociales.* (4 ed.). Paris: Armand Colin.

Paradis, V., Cossette, S., Frasure-Smith, N., Heppell, S., & Guertin, M. C. (2010). The efficacy of a motivational nursing intervention based on the stages of change on self-care in heart failure patients. *Journal of Cardiovascular Nursing, 25*(2), 130–141. https://doi.org/10.1097/JCN.0b013e3181c52497

Pepin, J., Ducharme, F., & Kérouac, S. (2017). *La pensée infirmière*. (4e éd.). Chenelière Éducation.

Perk, J., De Backer, G., Gohlke, H., Graham, I., Reiner, Z., Verschuren, M., . . . Zannad, F. (2012). European guidelines on cardiovascular disease prevention in clinical practice. *European Heart Journal, 33*(13), 1635–1701. https://doi.org/10.1093/eurheartj/ehs092

Polit, D. F., & Beck, C. T. (2017). *Essentials of nursing research: Appraising evidence for nursing practice* (8e éd.). Wolters Kluwer/Lippincott/Williams & Wilkins Health.

Prochaska, J. O., & DiClemente, C. C. (1984). *The transtheoretical approach.* (1e éd.). Dow Jones-Irwin.

Public Health Agency of Canada. (2017). *Heart disease in Canada*. canada.ca/content/dam/phac-aspc/documents/services/publications/diseases-conditions/heart-disease-fact-sheet/heart-disease-factsheet-eng.pdf

Purath, J., Keck, A., & Fitzgerald, C. E. (2014). Motivational interviewing for older adults in primary care: A systematic review. *Geriatric Nursing, 35*(3), 219–224. https://doi.org/10.1016/j.gerinurse.2014.02.002

Rasinaho, M., Hirvensalo, M., Tormakangas, T., Leinonen, R., Lintunen, T., & Rantanen, T. (2011). Effect of physical activity counseling on physical activity of older people in Finland. *Health Promotion International, 27*(4), 463–474. https://doi.org/10.1093/heapro/dar057

Sattelmair, J., Pertman, J., Ding, E. L., Kohl, H. W., Haskell, W., & Lee, I. M. (2011). Dose response between physical activity and risk of coronary heart disease: A meta-analysis. *Circulation, 124*(7), 789–795. https://doi.org/10.1161/CIRCULATIONAHA.110.010710

Song, H. Y., Yong, S. J., & Hur, H. K. (2014). Effectiveness of a brief self-care support intervention for pulmonary rehabilitation among the elderly patients with chronic obstructive pulmonary disease in Korea. *Rehabilitation Nursing, 39*(3), 147–156. https://doi.org/10.1002/rnj.92

Sumner, J., Grace, S. L., & Doherty, P. (2016). Predictors of cardiac rehabilitation utilization in England: Results from the national audit. *Journal of the American Heart Association, 5*(10), 1–7. https://doi.org/10.1161/JAHA.116.003903

Thompson, D. R., Chair, S. Y., Chan, S. W., Astin, F., Davidson, P. M., & Ski, C. F. (2011). Motivational interviewing: A useful approach to improving cardiovascular health? *Journal of Clinical Nursing, 20*, 1236–1244. https://doi.org/10.1111/j.1365-2702.2010.03558.x

Tolmie, E. P., Lindsay, G. M., Kelly, T., Tolson, D., Baxter, S., & Belcher, P. R. (2009). Are older patients' cardiac rehabilitation needs being met? *Journal of Clinical Nursing, 18*(13), 1878–1888. https://doi.org/10.1111/j.1365-2702.2009.02798.x

van Nes, M., & Sawatzky, J. A. (2010). Improving cardiovascular health with motivational interviewing: A nurse practitioner perspective. *Journal of the American Association of Nurse Practitioners, 22*(12), 654–660. https://doi.org/10.1111/j.1745-7599.2010.00561.x

VanBuskirk, K. A., & Wetherell, J. L. (2014). Motivational interviewing with primary care populations: A systematic review and meta-analysis. *Journal of Behavioral Medicine, 37*(4), 768–780. https://doi.org/10.1007/s10865-013-9527-4

World Health Organization. (2018). *Vieillissement et santé*. http://www.who.int/fr/news-room/fact-sheets/detail/ageing-and-health

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Effectiveness of Nurse-led Group Cognitive-behavioural Therapy on Fatigue, Quality of Life, and Depression in Heart Failure: A Pilot Study

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Abstract

Background: *Fatigue in heart failure is linked to decreased quality of life and increased depression levels. Cognitive-behaviour therapy (CBT) has been shown to help alleviate fatigue and improve quality of life.*

Purpose: *This pilot study was conducted to evaluate the effectiveness of nurse-led group CBT on fatigue, quality of life, and depression in heart failure patients.*

Methods: *A pre-test post-test design was used. Participants (N=11) attended two group CBT sessions. Fatigue, quality of life, and depression were measured before and after the intervention.*

Findings: *Participants reported significantly less physical and activity-related fatigue post-intervention. There were no significant differences in quality of life or depression scores.*

Conclusion: *The findings suggest that group CBT sessions may help alleviate some fatigue symptoms. Larger scale studies are needed to replicate these results among heart failure patients.*

Implications: *Nurse-led CBT may help patients with heart failure better manage their fatigue.*

Key words: heart failure, fatigue, quality of life, depression, cognitive-behavioral therapy

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Key highlights:

- Fatigue in HF patients is linked to decreased quality of life and increased depression levels.
- A program of nurse-led, group CBT may decrease fatigue levels among HF patients.
- Nurse-led, group CBT may be a cost-effective strategy to manage HF symptoms, especially in younger patients and women.

Background

Heart failure (HF) continues to be a great burden on patients and their families, as well as the overall healthcare system in Canada. Heart failure affects 600,000 Canadians, and there are 50,000 new cases diagnosed every year (Heart and Stroke Foundation, 2016). Individuals affected by HF experience numerous symptoms, such as fatigue, dyspnea, and peripheral edema (Falk et al., 2013; Park et al., 2019). Among all HF symptoms, fatigue causes the most distress (Jones et al., 2012), and occurs in 39% to 69% of HF patients (Nasiri et al., 2016; Williams, 2017).

Healthcare providers tend to ignore fatigue during health assessments of HF patients because of the difficulty in measuring fatigue (Carlson et al., 2001). In addition, HF patients do not associate increased fatigue with worsening of this disease (Carlson et al., 2001; Schumacher et al., 2018). Thus, HF patients may delay seeking help because they are not aware of the ramifications of worsening fatigue levels, and healthcare providers may overlook the importance of fatigue assessment in these patients.

There are several long-term consequences of chronic fatigue in HF patients. Fatigue may result in emotional distress, a decrease in activities of daily living, delays in seeking treatment, and worsening clinical outcomes (Heo et al., 2019; Perez-Moreno et al., 2014). Furthermore, individuals with HF suffering from physical symptoms, such as fatigue, report a lower quality of life (Yu et al., 2016) and depression (Fan & Meng, 2015; Graven et al., 2015; Hallas et al., 2011; Williams, 2017). Depression symptoms are also reportedly a precipitating factor in hospital admissions for exacerbation of HF (Wu et al., 2017). Conversely, effective management of fatigue can improve self-care, quality of life, and cardiovascular outcomes in these patients (Kessing et al., 2016).

Recent studies have reported that cognitive behavioural therapy (CBT) has a positive impact in patients with cardiovascular disease (Cajanding, 2016; Freeland et al., 2015; Gary et al., 2010). CBT is a form of psychotherapy, which is now commonly used for individuals who have chronic health problems. One of the main tenets of CBT is that faulty thinking patterns cause maladaptive behaviour and emotions (González-Prendes & Resko, 2012). CBT strategies include self-monitoring, goal setting, and problem solving. With CBT, individuals learn to become aware of negative patterns and cognitions, which transform into more realistic, balanced thinking and, in turn, reduce symptoms (González-Prendes & Resko, 2012).

CBT studies among HF patients have shown positive results (Cajanding, 2016; Redeker et al., 2015). Jeyanantham et al. (2017) conducted a systematic review and meta-analysis to evaluate the effect of individual CBT on depression, quality of life, hospitalization, and mortality in HF patients. Their review included six CBT intervention studies (*n* = 320). Most participants were classified as NYHA II and III HF, with ages ranging from 55 to 66 years old. Findings suggested improvement in quality of life and depression scores immediately after CBT sessions and three months later. The length and format of CBT sessions varied among the studies. Furthermore, the number of sessions (e.g., 12 weekly sessions versus one session followed by a booster telephone session) and the providers of the CBT (i.e., nurses versus therapists) varied. Although all of the studies in the systematic review were based on individual CBT interventions, Brown et al. (2011) compared individual versus group CBT among patients suffering from depression and found no differences in outcomes. Furthermore, the authors noted that group CBT was more cost-effective than individual CBT.

According to the literature, both individual and group CBT sessions led to positive outcomes in HF patients. Whereas many studies have examined individual CBT, less research has been done on the outcomes of group CBT in the HF population. Moreover, to date, none of these studies were done in Canada. Thus, the current study addressed this gap in the literature by examining the effectiveness of nurse-led group CBT on fatigue, depression, and quality of life in HF patients in an eastern Canadian province.

Theoretical Framework: Symptom Management Model

This study was based on Dodd et al.'s (2001) revised Symptom Management Model (SMM) (see Figure 1). The SMM is a multidimensional model with inputs, processes, and outputs. The three central dimensions of the SMM are: the symptom experience, components of symptom management strategies, and outcomes.

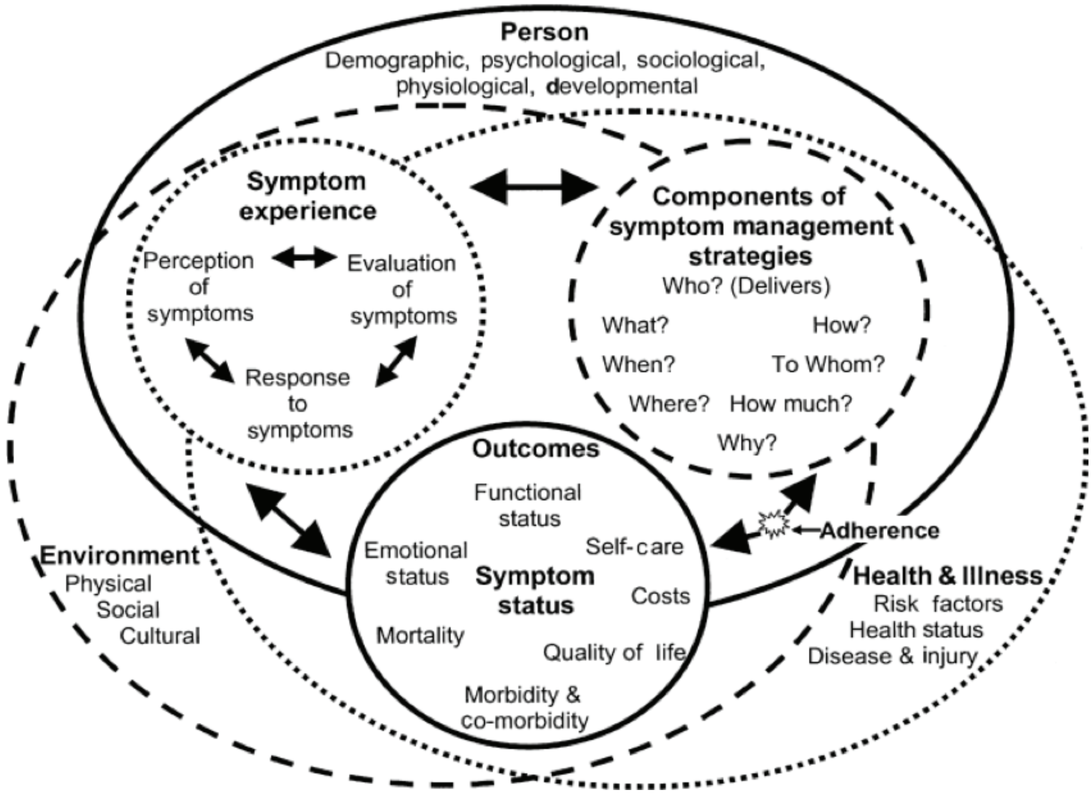

Figure 1. Revised Symptom Management Conceptual Model
Figure 1. Revised Symptom Management Conceptual Model. Adapted from "Advancing the Science of Symptom Management," by Dodd et al., 2001, Journal of Advanced Nursing, 33(5), p. 670. Copyright by John Wiley & Sons Ltd . Reprinted with permission 090210.

According to Dodd et al. (2001), the *symptom experience* includes the person's perception of the symptom, evaluation of the meaning of the symptom, and response to the symptom (e.g., fatigue). *Symptom management strategies* are defined as efforts to decrease or eliminate symptoms (e.g., the group CBT intervention). When this model is employed in a person living with a chronic condition, the ultimate goal is self-management. In this way, patients become their own caregivers. *Outcomes* are the results of symptom management strategies (e.g., quality of life and depression).

Aim

The purpose of this pilot study was to evaluate the effectiveness of nurse-led group CBT on fatigue, quality of life, and depression in patients with heart failure.

Methods

A pre-test post-test design with repeated measures before and after the CBT intervention was used in this pilot study. Ethical approval was obtained from the Vitalité Health Network and the Université de Moncton's ethics review committees.

Sample and Setting

This pilot study was conducted within the HF clinic at a tertiary hospital in Moncton, New Brunswick. This clinic serves both rural and urban HF patients. Inclusion criteria for study participation were: 1) aged 18 years or older, with 2) New York Heart Association (NYHA) Functional Classification II-IV, and 3) normal cognitive function, as assessed by the nurse at the HF clinic.

Recruitment for this study was initiated in April, 2018. A nurse at the HF clinic contacted all current clinic patients who met the inclusion criteria (N = 158). Of those contacted, 115 refused for various reasons: study too far from home (n = 48); unavailable for the study period (n = 34); and no method of transportation (n = 33). The remaining 43 eligible potential participants consented to be contacted by the researcher to receive details of the study. All of these potential participants initially agreed to participate, and were then sent consent forms and a survey questionnaire by mail. The respondents were asked to send the completed survey, in a pre-addressed, stamped envelope, to the researcher, four weeks prior to the first session. Twenty-two completed questionnaires (14% response rate) were received before the first session. Of these, nine participants withdrew prior to the first session and two withdrew after the first session for various reasons (i.e., hospitalization and voluntary withdrawal), for a final study sample of 11 participants completing the study (final response rate = 7%).

Procedures

Data for this study were collected from July to September, 2018. Data were collected at three times during this study: 1) four weeks prior to the first group CBT session (T1); 2) at the beginning of the first CBT session (T2); and 3) four weeks after the second CBT session (T3). The timeframe for data collection was determined after consulting with two clinicians and researchers working with this population. CBT sessions were conducted by a CBT-trained nurse and lasted approximately an hour. The sessions were offered in either English or French, based on the participant's preference.

In the first group session, information on the symptom of fatigue, in the context of HF, was given to participants. Goal setting was encouraged to enable the participants to restructure negative thought patterns. Participants were also asked to reflect on their levels of fatigue and to recognize any negative feelings associated with their fatigue. Energy management strategies were discussed in order to help transform negative thoughts and feelings to more positive beliefs. Participants were encouraged to share personal life experiences and techniques they had tried to deal with their fatigue with the group. The participants were given a journal and encouraged to make note of their thoughts, emotions, and actions related to fatigue levels and external factors that could be contributing to their fatigue in the week between the sessions. These journals were not analyzed in the study.

In the second session, participants were asked to share their experiences of the past week with each other. This session also included an educational component about the importance of proper sleep hygiene, prioritizing activities, and rest. With every topic, the participants were asked to share their experiences and stories with others.

Measures

Fatigue was measured using the Multidimensional Fatigue Inventory (MFI) (Smets et al., 1995). The MFI contains a total of 20 items, divided into five subscales: general fatigue, physical fatigue, reduced motivation, reduced activity, and mental fatigue (total score range = 4-20). An example of an item from the physical fatigue subscale is "*I feel very active.*" Responses are measured using a five-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). A higher score reflects a greater level of fatigue. Total fatigue scores are categorized as none (range 1–4), mild (range 5–8), moderate (9–12), severe (range 13–16), and very severe (range 17–20) (Falk et al., 2007). The MFI has good psychometric qualities, with Cronbach's alpha coefficient ranging from .70 to .80, and it has been used in previous HF studies (Smets et al., 1995; Staniute et al., 2014). The MFI has been translated and validated in French Canadians and this version also reportedly has good psychometric qualities (Fillion et al., 2003).

Quality of life was measured with the Minnesota Living with Heart Failure Questionnaire (MLHFQ) (Rector, 1987). The MLHFQ includes 21 items, ranked on a six-point Likert scale, representing the various degrees of impact of HF on quality of life (i.e., 0 = none; 5 = very much). The MLHFQ provides scores for the physical and emotional dimensions, as well as a total score. The physical dimension includes eight items (range = 0-40) and the emotional dimension includes five items (range = 0-25). The other eight items are only considered for the calculation of the total score (range = 0-105), with higher scores indicating a poorer quality of life. A score of less than 24 represents a good quality of life, a score between 24 and 45, a moderate quality of life, and a score of more than 45, a poor quality of life (Behlouli et al., 2009). An example of an item in the physical dimension is: "*Did your heart failure prevent you from living as you wanted during the past month by making you short of breath?*" Previous HF studies have reported a high internal consistency, with Cronbach's alpha ranging from 0.86 to 0.95 (De Jong et al., 2005; Stephen, 2008). The French version of the MLHFQ also has high reliability and validity (Briançon et al., 1997).

Depression symptoms were measured using the Patient Health Questionnaire-8 (PHQ-8) (Kroenke et al., 2009). This tool is an adaptation of the PHQ-9 scale. Accordingly, the item "*How often during the past two weeks were you bothered by thoughts that you would be better off dead, or of hurting yourself in some way?*" was removed. Participants are asked how many days they were bothered by various depression symptoms during the past two weeks. An example of an item is: "*Little interest or pleasure in doing things.*" The answers are measured using a four-point Likert scale ranging from 0 (not at all) to 3 (nearly every day). The PHQ-8 score is calculated by the sum of all items, and the level of depression is determined by the score (i.e., 0 to 4 = no significant depression; 5 to 9 = mild depression; 10 to 14 = moderate depression; 15 to 19 = moderately severe depression; and 20 to 24 = severe depression) (Kroenke et al., 2009). The PHQ-8 has been used in previous studies with HF patients (Pressler et al., 2011) and has acceptable psychometric qualities.

A sociodemographic questionnaire included information related to the participant's sex, age, civil status, level of schooling, job status, household income, NYHA Functional Class (as determined by the cardiologist), and the presence of other health problems, such as diabetes or high blood pressure.

Data Analysis

Data analysis was conducted using SPSS version 24. Participant characteristics were explored with descriptive statistics. Categorial variables are presented using frequency and percentage data. Descriptive analyses were performed for the main study variables using means and standard deviations (SD). Data were assessed for skewness and kurtosis. Paired t-tests were used to examine the effect of the program on the outcome variables at T1 and T3. Cohen's d was used to examine the effect size (Cohen, 1992). A *p*-value of less than 0.05 was considered significant. Descriptive statistics were also used to explore both age and sex related differences in scores over time.

Results

Our final sample included 11 chronic HF participants. Most of the sample (*n* = 7; 64%) were male. The mean age of participants was 72 (range = 52 to 87 years old). Only one participant was over 80 years old. Most participants (*n* = 9; 81%) were retired and six participants (55%) were married. In addition, most participants (81%) were classified as NYHA Functional Class II, while two participants (*n* = 2%) belonged to NYHA class III. Eight participants (73%) had more than one additional health problem (e.g., diabetes, high blood pressure) (see Table 1).

Table 1. ***Sociodemographic Characteristics of Participants (N = 11)***

Variables	*n* (%)
Age	
75 and under	6 (54)
76 and over	5 (45)
Sex	
Male	7 (64)
Female	4 (36)
Marital status	
Single	1(9)
Married	6 (55)
Separated/widowed	4 (36)
Other	0 (0)
Employment status	
Full time	1(9)
Part time	1(9)
Retired	9 (82)
Functional class	
II	9 (81)
III	2 (18)
IV	0 (0)
Number of comorbidities	
1	3 (27)
2–4	4 (36)
5–7	4 (36)

All mean fatigue subscale scores at T1 reflected mild to moderate levels of fatigue. The highest mean scores were found in relation to the physical fatigue (12.55 ± 4.37), general fatigue (11.91 ± 3.11), reduced activity (11.73 ± 3.74), mental fatigue (8.27 ± 3.64), and reduced motivation (8.09 ± 3.75). Both mean general fatigue and reduced activity scores decreased significantly from T1 to T3. None of the other subscales had significant differences over time (see Table 2).

At baseline, total quality-of-life scores indicated that participants had a moderate quality of life (33.64 ± 24.17). The baseline scores of the physical and emotional subscales were 15.91 (± 10.59) and 6.09 (± 7.29) respectively. There were no significant differences in quality-of-life scores between T1 and T3. However, the quality-of-life subscale scores decreased over time, suggesting an improved quality of life. Lastly, depression scores at T1 were mild (5.91 ± 6.59) and there were no significant differences in depression over time.

Several trends were found in relation to specific age groups. Given the small sample size, we divided the participants into two subgroups (≤75 years old & > 75 years old). Older participants reported less fatigue at T1 in all subscale dimensions compared to younger participants. Furthermore, general fatigue scores improved considerably among the younger participants between T1 and T3, suggesting that the intervention may have been more successful among the younger participants (see Table 2). In addition, the quality-of-life scores at baseline suggested that younger participants may have had poorer quality of life than older participants. Lastly, older participants had no depression symptoms at T1 and T3, while younger participants presented mild depression symptoms at T1 and T3 (see Table 2).

Although not statistically significant, trends in sex differences were also noted. For example, fatigue levels at T1 were lower in female participants for all subscales (Table 3). Depression symptoms at baseline were more severe in female participants than male participants. Depression symptoms increased slightly in men from T1 to T3, while the opposite trend was seen among female participants. Total quality-of-life scores at T1 were similar among male and female participants. However, quality of life improved more among women than among men from T1 to T3.

Discussion

The purpose of this pilot study was to examine the effectiveness of nurse-led group CBT on fatigue, quality of life, and depression for individuals with HF. Our findings indicate that participants had moderate levels of fatigue at baseline (T1). These fatigue levels are comparable to HF patients of similar age in previous studies (Falk et al., 2006; Watt et al., 2000). Similarly, our participants had higher levels of fatigue compared to healthy individuals within the same age range (Falk et al., 2006; Watt et al., 2000). Our participants also had moderate quality-of-life scores and mild depression scores at T1, which were comparable to other studies that included patients with similar NYHA class (Holland et al., 2010; Pressler et al., 2011).

Our findings indicate that, even with the small sample size, two subscales of the MFI, *general fatigue* and *reduced activity,* decreased significantly from baseline at T1 to T3.

Table 2. ***Change in Fatigue, Quality of Life and Depression Over Time*** **(t-tests; N = 11)**

	Time 1 (T1)		Time 2 (T2)		Time 3 (T3)				
	M	SD	M	SD	M	SD	*t* (T1-T3)	*p*	Cohen's *d*
Fatigue									
General fatigue	11.91	3.11	11.64	3.85	9.81	3.82	2.44	0.035*	.60
Physical fatigue	12.55	4.37	12.09	3.67	10.82	4.71	2.13	0.059	.38
Reduced activity	11.73	3.74	10.82	4.77	9.00	3.61	3.19	0.010*	.74
Reduced motivation	8.09	3.75	8.91	3.81	9.27	3.35	-.19	0.854	.05
Mental fatigue	8.27	3.64	8.82	3.89	8.55	4.23	-.42	0.683	.07
Quality of life									
Total	33.64	24.17	40.27	24.31	28.82	18.47	1.28	0.229	.22
Emotional subscale	6.09	7.29	8.26	7.53	5.73	5.44	0.35	0.733	.06
Physical Subscale	15.91	10.59	20.82	11.78	13.36	8.92	1.57	0.148	.26
Depression	5.91	6.59	6.91	6.44	5.55	6.27	0.31	0.761	.06

Note. M = mean; *SD* = standard deviation; * p <0.05

This suggests that, despite study limitations, the intervention may have improved fatigue levels among our participants. On the other hand, there were no significant differences in quality-of-life or depression scores from T1 to T3. Both quality-of-life scores remained moderate and depression continued to be mild at T3. Given that depression scores were mild at baseline, it is not surprising that they remained relatively stable throughout the study.

Our findings corroborate empirical evidence indicating that individual CBT interventions improve outcomes for patients with HF (Cajanding, 2016; Freeland et al., 2015; Jeyanantham et al., 2017). Nonetheless, we need to be cautious about these results because of our small sample. Moreover, none of the studies in Jeyanantham et al.'s (2017) meta-analysis found differences at three months after CBT, which suggests that the long-term benefits of individual CBT are less clear. Jeyanantham et al. (2017) concluded that larger, longitudinal, randomized control trials are needed to assess the long-term effects of CBT on HF patients. Because the few studies published on group CBT have reported favourable results, future research should focus on this cost-effective CBT strategy.

We found several interesting trends in relation to the study variables and participant age. However, these results must be interpreted with caution because of the small sample. At T1, older participants reported lower fatigue levels, better quality of life, and lower depression scores than younger participants. Similar findings in relation to older people have been noted in several studies (Moser et al., 2013; Nesbitt et al. 2014). Moser et al.'s (2013) mixed method study of patients with HF (N = 20) may shed some light on possible reasons for these results. These authors found that quality of life, depression, and anxiety were worse among the younger cohort. Older participants explained that their quality of life exceeded their personal expectations, given their age and health condition. On the other hand, the younger group reported finding it difficult to keep up with the activity level of their former selves and the people around them (Moser et al., 2013).

Table 3. ***Age and Sex Differences of Study Variable Means Over Time***

	Time 1		**Time 3**	
Age	***M***	***SD***	***M***	***SD***
General Fatigue				
≤ 75 (*n* = 6)	13.50	40.67	9.33	2.74
> 75 (*n* = 5)	10.00	25.20	1.80	2.55
Quality of Life				
≤ 75	27.63	7.15	10.17	30.00
> 75	18.53	2.49	9.40	27.40
Depression				
≤ 75	8.67	4.71	18.83	7.09
> 75	1.80	2.88	20.13	1.79
Sex				
General fatigue				
Male (*n* = 7)	12.14	33.29	5.14	2.68
Female (*n* = 4)	11.50	34.25	7.25	4.20
Quality of Life				
Male	21.70	5.61	10.29	30.29
Female	31.70	4.42	9.00	26.25
Depression				
Male	6.43	4.53	17.45	6.35
Female	4.00	2.45	22.68	6.73

Note. N = 11. *M* = mean; *SD* = standard deviation

Despite the small sample size, differences between male and female participants were also noted. Although female and male participants had similar baseline quality-of-life levels, female participants had higher baseline levels of depression symptoms. Moreover, quality of life improved more for women than men after the CBT intervention, and depression decreased in women and increased in men from T1 to T3. Kao et al. (2014) found that people with HF had a higher probability of depression if they had a worse quality of life. Several studies have also indicated that women have more severe depression symptoms than men (Kao et al., 2014; Rutledge et al., 2006). Heart failure brings distinctive challenges and psychosocial difficulties in women, such as having difficulty supporting family and friends (Halm & Penque, 2000). Nurse-led group CBT could be an effective strategy to help women with HF cope more effectively with their illness

Limitations

This pilot study has several limitations. First, we cannot generalize the findings from our study because of the small sample size. Despite rigorous efforts, we were unable to meet our target goal for recruitment. Our study took place in the middle of an extreme heatwave, which may have contributed to the small number of participants, as HF patients tend to be more symptomatic in extreme heat. In addition, some HF clinic patients came from rural areas, as far as 50 km away, making it difficult for some to attend the CBT sessions. Perhaps the rural participants felt more isolated or had less access to resources and, therefore, perceived more benefits of group sessions than their urban counterparts. Second, the sample was relatively homogeneous, as the participants were recruited from a small outpatient centre, with NYHA functional class II and III, relatively good quality of life, and mild depression. The participants were also independent in their daily activities making it impossible to generalize our findings to the HF patients in poorer health. Third, we were unable to evaluate long-term effects of group CBT due to the short duration of the study. Therefore, future research should include larger studies that examine the long-term impact of this kind of program on HF patients.

Implications for Nursing

This study has several important implications for nurses. The results of this study suggest that a nurse-led group CBT intervention may have the potential to reduce fatigue in the HF population. Reliable and valid fatigue assessment tools, such as the fatigue pictogram (Fitch et al., 2011), should be implemented in HF clinics, thus enabling nurses to monitor fatigue levels during outpatient care and assess for symptoms of worsening heart failure. Nurse managers should consider encouraging nurses working in cardiac clinics to become trained in basic CBT skills and incorporate CBT for some HF patients.

There is also a need for further nursing research in this area. Dodd et al.'s (2001) SMM was an appropriate framework for our pilot study on symptom management in HF patients and could be used in future studies of symptom management strategies and outcomes (symptom status). Larger randomized-control studies with patients from all NYHA classes are needed. Longitudinal studies examining changes over time are also important in gaining a better understanding of the effects of CBT on longer term symptom experiences and outcomes. Larger studies would also enable researchers to identify age and gender differences related to CBT outcomes. Lastly, targeted CBT interventions should be used for those who have less access to healthcare resources, such as the elderly living in rural areas. A promising strategy for these vulnerable groups living in rural areas is web-based CBT, given that it has been found to successfully decrease depression levels in HF patients (Lundgren et al., 2015). Finally, qualitative studies may provide further insight into the symptom experiences of patients who participate in CBT. A mixed-methods approach using the SMM may enable researchers to understand the factors that facilitate symptom management, as well as evaluating the outcomes of interventions (symptom status).

Conclusion

The findings of this pilot study suggest that nurse-led, group-CBT programs have the potential to help patients better manage their HF symptoms. Despite the small sample, our study fills a gap in the HF literature, given that, to date, most research has focused on individual CBT. Not all HF patients may want or be able to attend individual CBT programs. Therefore, cost-effective, innovative alternatives such as a combination of group CBT and web-based CBT may meet the needs of heart failure patients living in both urban and rural areas. Moreover, CBT-trained nurses have an important role in helping patients and their families understand and manage fatigue symptoms within these programs. Further research is needed to verify the benefits of nurse-led, group CBT in reducing fatigue and depression and improving quality of life in the HF population.

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REFERENCES

Behlouli, H., Feldman, D. E., Ducharme, A., Frenette, M., Giannetti, N., Grondin, F., Michel, C., Sheppard, R., & Pilote, L. (2009). Identifying relative cut-off scores with neural networks for interpretation of the Minnesota Living with Heart Failure questionnaire. *Annual International Conference of the IEEE Engineering in Medicine and Biology Society,* 6242–6246. https://doi.org/10.1109/IEMBS.2009.5334659

Briançon, S., Alla, F., Mejat, E., Guillemin, F., Villemot, J. P., Mertes, P. M., & Zannad, F. (1997). Measurement of functional inability and quality of life in cardiac failure. Transcultural adaptation and validation of the Goldman, Minnesota and Duke questionnaires. *Archives des Maladies du Coeur et des Vaisseaux, 90*(12), 1577–1585. https://www.ncbi.nlm.nih.gov/pubmed/?term=9587437

Brown, J. S., Sellwood, K., Beecham, J. K., Slade, M., Andiappan, M., Landau, S., Johnson, T., & Smith, R. (2011). Outcome, costs and patient engagement for group and individual CBT for depression: A naturalistic clinical study. *Behavioural and Cognitive Psychotherapy, 39*(3), 355–358. https://doi.org/10.1017/S135246581000072X

Cajanding, R. J. M. (2016). The effectiveness of a nurse-led cognitive–behavioral therapy on the quality of life, self-esteem and mood among Filipino patients living with heart failure: A randomized controlled trial. *Applied Nursing Research, 31,* 86–93. https://doi.org/10.1016/j.apnr.2016.01.002

Carlson, B., Riegel, B., & Moser, D. K. (2001). Self-care abilities of patients with heart failure. *Heart & Lung, 30*(5), 351–359. https://doi.org/10.1067/mhl.2001.118611

Cohen, J. (1992). Statistical power analysis. *Current Directions in Psychological Science, 1*(3), 98–101. https://doi.org/10.1111/1467-8721.ep10768783

Dalal, H. M., Taylor, R. S., Jolly, K., Davis, R. C., Doherty, P., Miles, J., Van Lingen, R., Warren, F. C., Green, C., Wingham, J. & Greaves, C., (2019). The effects and costs of home-based rehabilitation for heart failure with reduced ejection fraction: The REACH-HF multicentre randomized controlled trial. *European Journal of Preventive Cardiology, 26*(3), 262–272. https://doi.org/10.1177/2047487318806358

De Jong, M. M. J., Moser, D. K., & Chung, M. L. (2005). Predictors of health status for heart failure patients. *Progress in Cardiovascular Nursing, 20*(4), 155–162. https://doi.org/10.1111/j.0889-7204.2005.04649.x

Dodd, M., Janson, S., Facione, N., Faucett, J., Froelicher, E. S., Humphreys, J., Lee, K., Miaskowski, C., Puntillo, K., Rankin, S., & Taylor, D. (2001). Advancing the science of symptom management. *Journal of Advanced Nursing, 33*(5), 668–676. https://doi.org/10.1046/j.1365-2648.2001.01697.x

Falk, H., Ekman, I., Anderson, R., Fu, M., & Granger, B. (2013). Older patients' experiences of heart failure – an integrative literature review. *Journal of Nursing Scholarship, 45*(3), 247–255. https://doi.org/10.1111/jnu.12025

Falk, K., Swedberg, K., Gaston-Johansson, F., & Ekman, I. (2006). Fatigue and anaemia in patients with chronic heart failure. *European Journal of Heart Failure, 8*(7), 744–749. https://doi.org/10.1016/j.ejheart.2006.01.016

Falk, K., Swedberg, K., Gaston-Johansson, F., & Ekman, I. (2007). Fatigue is a prevalent and severe symptom associated with uncertainty and sense of coherence in patients with chronic heart failure. *European Journal of Cardiovascular Nursing, 6*(2), 99–104. https://doi.org/10.1016/j.ejcnurse.2006.05.004

Fan, X., & Meng, Z. (2015). The mutual association between depressive symptoms and dyspnea in Chinese patients with chronic heart failure. *European Journal of Cardiovascular Nursing, 14*(4), 310–316. https://doi.org/10.1177/1474515114528071

Fillion, L., Gélinas, C., Simard, S., Savard, J., & Gagnon, P. (2003). Validation evidence for the French Canadian adaptation of the Multidimensional Fatigue Inventory as a measure of cancer-related fatigue. *Cancer Nursing, 26*(2), 143–154. https://www.doi.org/10.1097/00002820-200304000-00008

Fitch, M. I., Bunston, T., Bakker, D., Mings, D., & Sevean, P. (2011). The Fatigue Pictogram: Psychometric evaluation of a new clinical tool. *Canadian Oncology Nursing Journal/Revue Canadienne de Soins Infirmiers en Oncologie, 21*(4), 205–210. https://doi.org/10.5737/1181912x214205210

Freedland, K. E., Carney, R. M., Rich, M. W., Steinmeyer, B. C., & Rubin, E. H. (2015). Cognitive behavior therapy for depression and self-care in heart failure patients: A randomized clinical trial. *JAMA Internal Medicine, 175*(11), 1773–1782. http://dx.doi.org/10.1001/jamainternmed.2015.5220

Gary, R. A., Dunbar, S. B., Higgins, M. K., Musselman, D. L., & Smith, A. L. (2010). Combined exercise and cognitive behavioral therapy improve outcomes in patients with heart failure. *Journal of Psychosomatic Research, 69*(2), 119–131. https://doi.org/10.1016/j.jpsychores.2010.01.013

González-Prendes, A., & Resko, S. M. (2012). Cognitive-behavioral theory. In S. Ringel & J. Brandell (Eds.) *Trauma: Contemporary Directions in Theory, Practice, and Research,* (pp. 14-41). http://dx.doi.org/10.4135/9781452230597

Graven, L. J., Grant, J. S., Vance, D. E., Pryor, E. R., Grubbs, L., & Karioth, S. (2015). Predicting depressive symptoms and self-care in patients with heart failure. *American journal of health behavior, 39*(1), 77-87. https://doi.org/10.5993/AJHB.39.1.9

Hallas, C. N., Wray, J., Andreou P., & Banner N. R. (2011). Depression and perceptions about heart failure predict quality of life in patients with advanced heart failure. *Heart & Lung: The Journal of Cardiopulmonary and Acute Care, 40*(2), 111–121. https://doi.org/10.1016/j.hrtlng.2009.12.008

Halm, M. A., & Penque, S. (2000). Heart failure in women. *Progress in Cardiovascular Nursing, 15*(4), 121–133. https://doi.org/10.1111/j.0889-7204.2000.080399.x

Heart and Stroke Foundation. (2016). *Heart failure: Symptoms and diagnosis.* https://www.heartandstroke.ca/heart/conditions/heart-failure

Heo, S., Moser, D. K., Lennie, T. A., Grudnowski, S., Kim, J., & Turrise, S. (2019). Patients' beliefs about causes and consequences of heart failure symptoms. *Western Journal of Nursing Research 00*(0), 1–19. https://doi.org/10.1177/0193945918823786

Heo, S., Moser, D. K., Pressler, S. J., Dunbar, S. B., Dekker, R. L., & Lennie, T. A. (2014). Depressive symptoms and the relationship of inflammation to physical signs and symptoms in heart failure patients. *American Journal of Critical Care, 23*(5), 404–413. https://doi.org/10.4037/ajcc2014614

Holland, R., Rechel, B., Stepien, K., Harvey, I., & Brooksby, I. (2010). Patients' self-assessed functional status in heart failure by New York Heart Association class: A prognostic predictor of hospitalizations, quality of life and death. *Journal of Cardiac Failure, 16*(2), 150–156. https://doi.org/10.1016/j.cardfail.2009.08.010

Jeyanantham, K., Kotecha, D., Thanki, D., Dekker, R., & Lane, D. A. (2017). Effects of cognitive behavioural therapy for depression in heart failure patients: A systematic review and meta-analysis. *Heart Failure Reviews, 22*(6), 731–741. https://doi.org/10.1007/s10741-017-9640-5

Jones, J., McDermott, C. M., Nowels, C. T., Matlock, D. D., & Bekelman, D. B. (2012). The experience of fatigue as a distressing symptom of heart failure. *Heart & Lung: The Journal of Acute and Critical Care, 41*(5), 484–491. https://doi.org/10.1016/j.hrtlng.2012.04.004

Kao, C. W., Chen, T. Y., Cheng, S. M., Lin, W. S., Friedmann, E., & Thomas, S. A. (2014). Gender differences in the predictors of depression among patients with heart failure. *European Journal of Cardiovascular Nursing, 13*(4), 320–328. https://doi.org/10.1177/1474515113496493

Kessing, D., Denollet, J., Widdershoven, J., & Kupper, N. (2016). Psychological determinants of heart failure self-care: Systematic review and meta-analysis. *Psychosomatic Medicine*, *78*(4), 412–431. https://doi.org/10.1097/PSY.0000000000000270

Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders*, *114*(1-3), 163–173. https://doi.org/10.1016/j.jad.2008.06.026

Lundgren, J., Andersson, G., Dahlström, Ö., Jaarsma, T., Köhler, A. K., & Johansson, P. (2015). Internet-based cognitive behavior therapy for patients with heart failure and depressive symptoms: A proof of concept study. *Patient Education and Counseling*, *98*(8), 935–942. https://doi.org/10.1016/j.pec.2015.04.013

Moser, D. K., Heo, S., Lee, K. S., Hammash, M., Riegel, B., Lennie, T. A., Arslanian-Engoren, C., Mudd-Martin, G., Albert, N., & Watkins, J. (2013). 'It could be worse… lot's worse!' Why health-related quality of life is better in older compared with younger individuals with heart failure. *Age and Ageing*, *42*(5), 626–632. https://doi.org/10.1093/ageing/aft078

Nasiri, M., Rahimian, B., Jahanshahi, M., Fotoukian, Z., & Chaboki, A. M. O. (2016). Study of fatigue and associated factors in patients with chronic heart failure. *Journal of Critical Care Nursing*, *9*(3). https://doi.org/10.17795/ccn-8124

Nesbitt, T., Doctorvaladan, S., Southard, J. A., Singh, S., Fekete, A., Marie, K., Moser, D. K., Pelter, M. M., Robinson, S., Wilson, M. D., & Cooper, L. (2014). Correlates of quality of life in rural patients with heart failure. *Circulation: Heart Failure*, *7*(6), 882–887. https://doi.org/10.1161/CIRCHEARTFAILURE.113.000577

Park, J., Moser, D. K., Griffith, K., Harring, J. R., & Johantgen, M. (2019). Exploring symptom clusters in people with heart failure. *Clinical Nursing Research*, *28*(2), 165–181. https://doi.org/10.1177/1054773817729606

Perez-Moreno, A. C., Jhund, P. S., Macdonald, M. R., Petrie, M. C., Cleland, J. G., Böhm, M., Van Veldhuisen, D.J., Gullestad, L., Wikstrand, J., Kjekshus, J., & Lewsey, J. D. (2014). Fatigue as a predictor of outcome in patients with heart failure: Analysis of CORONA (Controlled Rosuvastatin Multinational Trial in Heart Failure). *Journal of the American College of Cardiology: Heart Failure*, *2*(2), 187–197. https://doi.org/10.1016/j.jchf.2014.01.001

Pressler, S. J., Subramanian, U., Perkins, S. M., Gradus-Pizlo, I., Kareken, D., Kim, J., Ding, Y., Sauvé, M. J., & Sloan, R. (2011). Measuring depressive symptoms in heart failure: Validity and reliability of the Patient Health Questionnaire–8. *American Journal of Critical Care*, *20*(2), 146–152. https://doi.org/10.4037/ajcc2010931

Razykov, I., Ziegelstein, R. C., Whooley, M. A., & Thombs, B. D. (2012). The PHQ-9 versus the PHQ-8—Is item 9 useful for assessing suicide risk in coronary artery disease patients? Data from the Heart and Soul Study. *Journal of Psychosomatic Research*, *73*(3), 163–168. https://doi.org/10.1016/j.jpsychores.2012.06.001

Rector, T. S. (1987). Patient's self-assessment of their congestive heart failure: II. Content, reliability and validity of a new measure—The Minnesota Living with Heart Failure Questionnaire. *Heart Failure*, *3*, 198.

Redeker, N. S., Jeon, S., Andrews, L., Cline, J., Jacoby, D., & Mohsenin, V. (2015). Feasibility and efficacy of a self-management intervention for insomnia in stable heart failure. *Journal of Clinical Sleep Medicine*, *11*(10), 1109–1119. https://doi.org/10.5664/jcsm.5082

Rutledge, T., Reis, V. A., Linke, S. E., Greenberg, B. H., & Mills, P. J. (2006). Depression in heart failure: A meta-analytic review of prevalence, intervention effects, and associations with clinical outcomes. *Journal of the American College of Cardiology*, *48*(8), 1527–1537. https://doi.org/10.1016/j.jacc.2006.06.055

Schumacher, C., Hussey, L., & Hall, V. (2018). Heart failure self-management and normalizing symptoms: An exploration of decision making in the community. *Heart & Lung*, *47*(4), 297–303. https://doi.org/10.1016/j.hrtlng.2018.03.013

Smets, E. M. A., Garssen, B., Bonke, B. D., & De Haes, J. C. J. M. (1995). The Multidimensional Fatigue Inventory (MFI) psychometric qualities of an instrument to assess fatigue. *Journal of Psychosomatic Research*, *39*(3), 315–325. https://doi.org/10.1016/0022-3999(94)00125-o

Staniute, M., Bunevicius, A., Brozaitiene, J., & Bunevicius, R. (2014). Relationship of health-related quality of life with fatigue and exercise capacity in patients with coronary artery disease. *European Journal of Cardiovascular Nursing*, *13*(4), 338–344. https://doi.org/10.1177/1474515113496942

Stephen, S. A. (2008). Fatigue in older adults with stable heart failure. *Heart & Lung*, *37*(2), 122–131. https://doi.org/10.1016/j.hrtlng.2007.03.006

Watt, T., Groenvold, M., Bjorner, J. B., Noerholm, V., Rasmussen, N. A., & Bech, P. (2000). Fatigue in the Danish general population. Influence of sociodemographic factors and disease. *Journal of Epidemiology & Community Health*, *54*(11), 827–833. https://doi.org/10.1136/jech.54.11.827

Williams, B.A. (2017). The clinical epidemiology of fatigue in newly diagnosed heart failure. *BMC Cardiovascular Disorder, 17,* 122. https://doi.org/10.1186/s12872-017-0555-9

Wu, J. R., Lee, K. S., Dekker, R. D., Welsh, J. D., Song, E. K., Abshire, D. A., Lennie, T.A. & Moser, D. K. (2017). Prehospital delay, precipitants of admission, and length of stay in patients with exacerbation of heart failure. *American Journal of Critical Care, 26*(1), 62–69. https://doi.org/10.4037/ajcc2017750

Yu, D. S., Chan, H. Y., Leung, D. Y., Hui, E., & Sit, J. W. (2016). Symptom clusters and quality of life among patients with advanced heart failure. *Journal of Geriatric Cardiology*, *13*(5), 408. https://doi.org/10.11909/j.issn.1671-5411.2016.05.014

Prevalence and Severity of Sexual Dysfunction and Sexual Dissatisfaction in Coronary Artery Disease: An Integrative Review

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Abstract

Coronary artery disease (CAD) remains a common health condition and can negatively affect sexual health. However, no literature has synthesized the sexual function and satisfaction issues experienced by this population. The aim of this integrative review was to synthesize existing quantitative research regarding sexual function and satisfaction in men and women with CAD. Eligible studies were evaluated descriptively. Nine out of 486 papers met eligibility criteria. Five manuscripts included both men and women. Men experienced more frequent sexual problems, while functional problems in women were more severe than in men. Although function was negatively impacted, sexual satisfaction was comparable to healthy controls. There was notable heterogeneity in the definition and measurement of sexual function. Cardiovascular nurses should be cognisant of the multidimensional components of dysfunction and their influencing factors, including age and CAD severity. Additional studies are needed to understand sexual dysfunction and dissatisfaction in the CAD population.

Key words: sexual health, sexual dysfunction, physiological; coronary artery disease

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Key Highlights

- Common sexual function concerns in patients with CAD include erectile, orgasm, lubrication, and arousal difficulties.
- The limited data suggests that while sexual function often decreases in patients with CAD, sexual satisfaction remains largely intact.
- Additional research is needed to address current gaps in evidence related to the impact of age, gender, culture, and CAD severity on sexual function and satisfaction.
- Cardiovascular nurses play a key role with addressing sexual function issues, and further research can help improve the abilities of nurses in assessment and management of sexual dysfunction and dissatisfaction.

Introduction

Chronic coronary artery disease (CAD), where plaque build-up accumulates and damages the vasculature, currently affects 18.2 million Americans over the age of 20 (Virani et al., 2020). The disease process of CAD produces a substantial burden on the heart by decreasing cardiac blood flow and subsequently increasing cardiac work effort and fatigue. These pathophysiologic effects can diminish overall quality of life in patients with CAD (Barsaei et al., 2020). However, one important yet understudied component of health-related quality of life is sexual function, which is conceptualized as the progression through the phases of the sexual response cycle from arousal to relaxation with a feeling of pleasure and fulfillment (Corona et al., 2006). Embedded within sexual function is sexual satisfaction, which pertains to an individual's appraisal of the contentedness of their physical and emotional satisfaction within their relationship or overall sex life (Ashdown et al., 2011).

Sexual function is decreased by CAD through the narrowing and occlusion of arteries that hinder blood flow to sex organs. In men, CAD is a pertinent contributor to erectile dysfunction via its effects on blood flow and endothelial function (Ibrahim et al., 2018). In women, vasocongestion and vaginal lubrication are similar products of increased vascular dilation and blood supply, and both are negatively impacted by CAD (Levin et al., 2016). Decreased blood flow to the heart and periphery also increases fatigue and chest pain during sexual activity and can generate anxiety and fear, especially concerns of causing myocardial infarction (Kriston et al., 2010). These factors also contribute to decreased satisfaction with the overall sexual relationship.

Given the importance of sexual function and satisfaction to CAD patients, the American Heart Association (AHA) and the Council on Cardiovascular Nursing and Allied Professions (CCNAP) recommend both the routine assessment of sexual problems and delivery of sexual counselling (Steinke et al., 2013). Indeed, cardiovascular nurses are among those faced with assessment and management of sexual function issues among CAD patients (Doherty et al., 2011). However, the state of the science regarding sexual function and satisfaction in this population remains poorly articulated, which precludes accurate treatment of sexual function problems by cardiovascular nurses. To date, no integrative assessment of the sexual function and satisfaction literature in CAD patients has been conducted. Therefore, there is a need to synthesize the currently available empirical evidence. This integrative literature review aimed to synthesize the components of sexual function and satisfaction that are affected in men and women with CAD.

Methods

An integrative review approach was utilized to summarize the previously published empirical evidence surrounding sexual function and satisfaction in CAD (Whittemore & Knafl, 2005). The diversity of components of sexual function (i.e., erection, lubrication, orgasm) produces challenges with traditional systematic and scoping reviews. As such, an integrative review strategy was selected to provide a comprehensive overview that encompasses a holistic conceptualization of sexual function. The intention was to also summarize the strengths and inadequacies of the current literature, presenting the subsequent implications for both cardiovascular nursing and for future research in this population.

The electronic search included five databases; Scopus, PubMed, PsycINFO, the Cumulative Index of Nursing and Allied Health (CINAHL), and the Cochrane Database for Systematic Reviews (CDSR). The search terms included synonyms for CAD (i.e., coronary artery disease, ischemic heart disease, cardiovascular disease, heart disease, cardiac illness), and several terms aimed to encompass sexual function and satisfaction (i.e., sexual dysfunction, sexual function, sexual satisfaction, sexual pleasure, sexuality, sexual behaviour, libido, orgasm, intimacy, sexual health, arousal, desire, erectile dysfunction, vaginal dryness, pain with intercourse).

The inclusion criteria were quantitative studies that measured any component of sexual function or satisfaction in human subjects with documented CAD. The exclusion criteria were participants with stroke, heart failure, myocardial infarction, rheumatic heart disease, and congenital heart disease; participants who had a marked history of depression, anxiety disorder, schizophrenia, or other mental illness; case studies; expert opinions; studies of participants during an intervention; and grey literature including response letters, editorials, or protocols. Patients with stroke, heart failure, myocardial infarction, rheumatic heart disease, and congenital heart disease were excluded because the differences in their underlying pathophysiology, prognosis, and functional changes compared to general CAD would constitute separate reviews. A 15-year timeframe (i.e., from 2004 to 2019) for published articles was selected. The decision to extend the standard timeframe of 10 years was made to capture a broader range of representative literature, given the focused nature of this integrative review, and the overall dearth of empirical research.

Articles were evaluated by their sampling and data collection procedures, their diagnostic criteria for CAD, the quantity and quality of covariates that were controlled for during the analysis, the theoretical and operational definitions of sexual function and satisfaction presented, and the selection and measurement of individual outcomes. The individual study designs, methods, and results were charted in a synthesis table. The strengths and weaknesses of each study were analysed and discussed among authors, and pertinent findings and gaps were synthesized.

Results

The initial search retrieved a total of 880 articles. After 394 duplicates were removed, 486 articles were screened by title and abstract. Following title and abstract screening, 477 articles were removed. Most of the articles (*n*=224) were excluded because they did not study sexual function, sexual satisfaction, or a population exclusively with CAD. An additional 160 articles were excluded because they were expert opinions or literature reviews about unrelated topics. The screening process resulted in a final sample of nine studies. A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram of the articles selected and screened is presented in Figure 1 (Moher et al., 2010).

Sample, Setting, and Design

Of the nine articles included in this review, one study was conducted in Denmark (Rundblad et al., 2017), three in Iran (Assari et al., 2014; Ghanbari Afra et al., 2015; Kazemi Saleh et al., 2008), two in Israel (Justo et al., 2010; Oren et al., 2016), one in Turkey (Kaya, et al., 2007), one in Norway (Træen & Olsen, 2007), and one in Poland (Kałka et al., 2017). Four studies examined a single gender (i.e., two men-only and two women-only), while the remaining studies included both genders. Sample sizes ranged from 20 to 1,136 with an average sample size of 423 CAD participants. The average age of participants with CAD across the selected studies was 62.4 years for men, and 53.2 years for women. All but one study was conducted with an average sample age of >50 years old, with the outlier studying women in their late thirties, on average (Kaya et al., 2007). Sexual function was measured in six studies, while one measured sexual satisfaction, and two studies measured both function and satisfaction concurrently. All the studies were cross-sectional in design, with six conducting active data collection and three utilizing secondary data.

Four different questionnaires were used to measure the study outcomes. These included the Larson's Sexual Satisfaction Questionnaire (LSSQ) (Larson et al., 1998), the Female

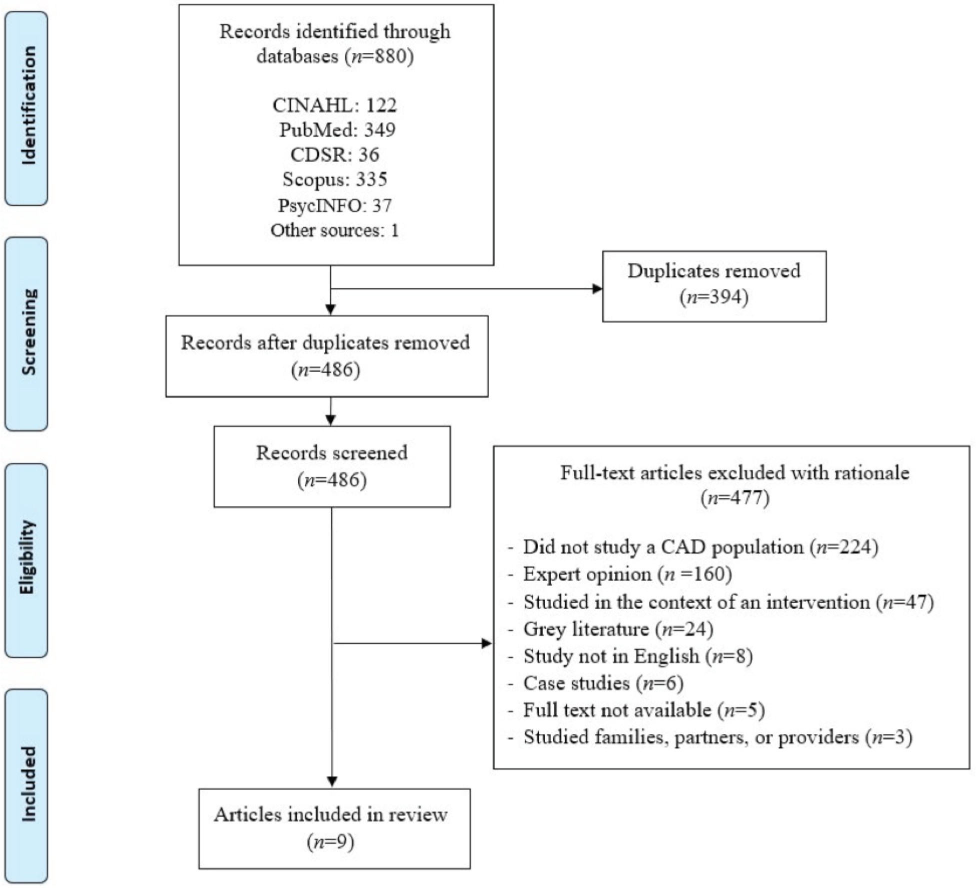

Figure 1. *PRISMA Diagram*
Note. CAD coronary artery disease, CDSR Cochrane Database for Systematic Reviews, CINAHL Cumulative Index of Nursing and Allied Health

Sexual Function Index (FSFI) (Rosen et al., 2000), the Relation and Sexuality Scale (RSS) (Berglund et al., 2001), and the International Index of Erectile Function, also known as the Sexual Health Inventory for Men (IIEF-5/SHIM) (Rosen et al., 1999). Evidence for internal validity within a CAD population was provided for the RSS (Tavallaii et al., 2007), LSSQ (Mofaraheh Shams et al., 2010), and FSFI (Oksuz & Malhan, 2006), with Cronbach's alphas ranging from 0.95 to 0.98. In contrast, evidence for internal validity in a CAD population was not provided by the studies using the IIEF-5/SHIM. The remaining two articles used investigator developed questionnaires (Rundblad et al., 2017, Træen & Olsen, 2007), and did not provide evidence for validity or reliability. Study demographics including sample sizes and average ages are presented in Table 1.

Theoretical Definitions and Operationalization

The broad outcomes of function and satisfaction were defined and operationalized differently across the selected studies. Theoretical definitions of sexual function ranged from "a complex process coordinated by the neurological, vascular and endocrine systems" (Kaya et al., 2007, p. 236), to "distressing disturbances in the sexual response cycle" (Rundblad et al., 2017, p. 786), to specifically defining erectile dysfunction as "the inability to attain and/or maintain penile erection sufficient for satisfactory sexual performance" (Kałka et al., 2017, p. 303). Three studies did not provide a theoretical definition (Assari et al., 2014; Kazemi Saleh et al., 2008; Oren et al., 2016).

Sexual function was operationalized as either the severity of functional problems, or the percentage of individuals who experienced a subcomponent of sexual dysfunction (e.g., erectile dysfunction, dyspareunia). Satisfaction was operationalized as either the overall degree of satisfaction, or the percentage of individuals who were satisfied with their sex lives. Two studies operationalized both sexual function and satisfaction concurrently (i.e., frequency and severity) (Justo et al., 2010; Træen & Olsen, 2007). While two studies measured a broad theoretical outcome of sexuality and sexual well-being, one was operationalized through a narrow focus

Table 1. ***Demographics of Selected Studies***

Study	Sample Size			Mean Age		
	Men	**Women**	**Controls**	**Men**	**Women**	**Controls**
Assari et al., 2014	396	155	-	57.2	56.3	-
Ghanbari Afra et al., 2015	106	44	150	Not reported		
Justo et al., 2010	112	-	11	74.6	-	78.2
Kałka et al., 2017	1136	-	-	60.7	-	-
Kaya et al., 2007	-	20	15	-	38.2	37.9
Kazemi Saleh et al., 2008	464	171	-	57.1	56.3	-
Oren et al., 2016	-	75	42	-	61.8	60.3
Rundblad et al., 2017	692	344	-	68.4	70.6	
Træen & Olsen, 2007	75	17	-	Not reported*		

**Note.* Sample was aged 50+ years, but mean age was not provided

on satisfaction with sex life (Træen & Olsen, 2007), and the second was through the effect of CAD and treatment on sex life, frequency of penetrative and non-penetrative intercourse, change in ability to orgasm, and sexual fear (Kazemi Saleh et al., 2008).

Sexual Function

Table 2 summarizes the key outcomes, covariates measured, major findings, strengths, and limitations of selected CAD studies. Sexual function was studied more frequently compared to satisfaction (eight versus three studies) and aligned into two categories: frequency of sexual problems and severity of sexual dysfunction. While both men and women experienced a broad variety of functional issues across the range of the sexual response cycle, a higher percentage of men reported having at least one sexual issue compared to women (M: 25–58%; W: 17–31%) (Rundblad et al., 2017; Træen & Olsen, 2007). However, women experienced dysfunction more profoundly than men. The most common sexual problems reported were issues with desire (M: 25-44%; W: 25-75%) (Assari et al., 2014; Rundblad et al., 2017; Træen & Olsen, 2007), ejaculation difficulties (M: 21–91%) (Assari et al., 2014; Træen & Olsen, 2007), erectile difficulties (M: 74–86%) (Assari et al., 2014; Justo et al., 2010; Kałka et al., 2017; Træen & Olsen, 2007;), premature or delayed orgasm (M: 11–18%; W: 13–37%) (Assari et al., 2014; Træen & Olsen, 2007), lubrication difficulties (W: 16–37%) (Assari et al., 2014; Træen & Olsen, 2007;), and pain with intercourse (W: 4–6%) (Assari et al., 2014; Træen & Olsen, 2007).

Findings conflicted among the two studies that compared severity of sexual dysfunction in women with CAD to healthy controls. While Kaya et al., (2007) reported that scores on the FSFI were significantly lower in women with CAD for desire, arousal, lubrication, orgasm, and pain with intercourse, Oren et al., (2016) did not observe these differences for total, arousal, or lubrication FSFI scores. These two studies also used the previously developed cut-off score of the FSFI to establish clinical sexual dysfunction (Wiegel et al., 2005). Using this cut-off, 60–64% of women with CAD were classified with sexual dysfunction, compared to 33–79% of healthy controls (Kaya et al., 2007; Oren et al., 2016). Of the two studies that compared severity of sexual dysfunction between genders, RSS scores were lower in women compared to men (Kazemi Saleh et al., 2008), and RSS scores were also negatively correlated with expression of affection and dyadic satisfaction among women, while this relationship was not observed with men (Assari et al., 2014).

The confidence in these data was strengthened by the broad range of well-validated measurements for sexual function with robust sampling techniques and inclusion criteria. Comprehensive screening for comorbidities improved the internal validity of the findings from two studies (Assari et al., 2014; Kazemi Saleh et al., 2008). However, others (Rundblad et al., 2017; Træen & Olsen, 2007) implemented inadequately validated measurements and did not provide evidence of psychometric testing. In addition, Træen and Olsen (2007) did not provide any diagnostic criteria for inclusion from the sampled registry, which produces questions regarding the rigour of the sampling processes. Furthermore, the authors did not indicate whether their control registry was free of people with CAD, only stating that it was a representative sample.

Table 2. ***Summary of Outcomes, Covariates, Major Findings, Strengths & Limitations of Selected Studies on CAD & Sexual Function & Satisfaction***

Authors (year) Sample size	Outcome (measurement)	Covariates	Major Findings	Strengths and Limitations
Assari et al. (2014) (N = 551)	Sexual function (RSS)	Age, BMI, cholesterol levels, comorbidities (COPD, diabetes), education, income, menopause, CAD severity	• Women had more issues with libido and orgasm compared to men, while arousal issues were similar among genders. • In men, 91.4% had an ejaculation disorder, and 15.5% of women had lubrication difficulties.	• The study controlled for the widest array of comorbidities among the selected studies, and utilized a multidimensional measure within a large sample. • While the study presented the frequency of sexual problems, the study did not report raw function scores on the RSS.
Ghanbari Afra et al. (2015) (N = 150)	Sexual satisfaction (LSSQ)	Education, employment, history of disease, cardiac medications	• Sexual satisfaction was similar between CAD and healthy controls even after controlling for covariates. • ~ 70% of patients with CAD and 64% of healthy controls were "highly satisfied" with their sex lives.	• The study used a well-validated measure of satisfaction and provided robust diagnostics for CAD. The study also utilized a control group. • There were significant differences between CAD and healthy controls, which impacted the internal validity. Age of the participants was not reported.
Justo et al. (2010) (N = 112)	Sexual function (IIEF-5/SHIM)	Age, cardiac severity, comorbidities (diabetes, hypertension), medications, marital stress, smoking	• Erectile dysfunction was more common in CAD compared to healthy controls, though this was a minimal increase (85.7% vs 72.7%).	• The study used a well validated measure of sexual function and controlled for several covariates. • The measurement used only assessed erectile quality. The exclusion criteria were not provided.
Kalka et al. (2017) (N = 1136)	Sexual function (IIEF-5/SHIM)	Age, BMI, comorbidities (diabetes, high cholesterol, hypertension) education, physical activity, smoking	• ~ 79% of patients had erectile dysfunction (mild: 26.5%, moderate: 12.8%, severe: 11.6%).	• The study leveraged a large sample size and controlled for several important covariates. • Only erectile function was measured, which forgoes other components of sexual function.
Kaya et al. (2007) (N = 20)	Sexual satisfaction (FSFI)	Age, BMI, education	• Sexual function was significantly decreased compared to healthy controls, but sexual satisfaction was not significantly different.	• A well validated measure of sexual function was utilized, as well as a control group. • The study had a small sample size, and was unable to control for other covariates.
Kazemi Saleh et al., (2008) (N = 650)	Sexual function (RSS)	Age	• Men had significantly lower scores on sexual function (10.4 vs 11), and sexual frequency (5.5 vs 6.5) than women, indicating better overall sexual function. Men had significantly higher sexual fear scores (0.8 vs 0.3).	• A large sample size was studied with a robust measurement of sexual function. • It was unclear how CAD was diagnosed. The study did not control for covariates. The inclusion criteria were not provided.
Oren et al. (2016) (N = 117)	Sexual function (FSFI)	Age, comorbidities (diabetes, hypertension), inflammatory markers, smoking, CAD severity	• Sexual function scores in women were comparable to a general population. • The percentage of sexual dysfunction among those with CAD was 72.4–76.1%.	• Utilization of a validated measurement of sexual function, as well as capturing several covariates. • The study only reported a portion of the FSFI subscales, and so is not fully multidimensional.
Rundblad et al. (2017) (N = 1036)	Sexual function (ID)	Age, anxiety, education, comorbidities (diabetes, hypertension), depression, marital status, medications	• ~ 46.4% of patients with CAD had at least one sexual problem. • In men, arousal or orgasm was the most reported (45.9%), while issues with desire was the most reported among women (23.4%).	• A large representative dataset was analyzed while controlling for several covariates. • The measures were investigator developed; reported response rates were 51% in men and 41.2% in women, which could indicate response bias.
Træen & Olsen (2007) (N = 1664)	Sexual function (ID) Sexual satisfaction (ID)	Age, marital status	• Patients with CAD had more sexual function issues compared to healthy controls. • 53% of patients with CAD and 66% of healthy controls were satisfied with their sex life.	• The study used a large national representative sample measuring both sexual function and satisfaction, and utilized a control group. • The measures were investigator developed. It was unclear how the control group registry was created.

Note. CAD coronary artery disease, FSFI Female Sexual Function Index, ID investigator developed, IIEF-5 International Index of Erectile Function - 5 item version, LSSQ Larson's Sexual Satisfaction Questionnaire, RSS Relation and Sexuality Survey, SHIM Sexual Health Inventory for Men

Sexual Satisfaction

Akin to sexual function, sexual satisfaction was also operationalized into either the severity of dissatisfaction, or the percentage of those satisfied with their sex life. Across these three studies, sexual satisfaction was consistently higher in patients despite reduced sexual function. Sexual satisfaction scores were similar between women with CAD when compared to healthy controls, which was observed across two different measures (i.e., FSFI and LSSQ) (Ghanbari Afra et al., 2015; Kaya et al., 2007). Interestingly, 47% of men and 64–71% of women older than 49 years of age were satisfied with their sex life, which was also comparable to a general population (64–66%) (Ghanbari Afra et al., 2015; Træen & Olsen, 2007).

The confidence in these results was strengthened as each study utilized different measurements, yet all achieved similar outcomes. In addition, two of these studies used well-validated measurements for sexual satisfaction, albeit with different topics and item phrasing. However, one study reported statistically significant differences between the CAD and control groups in gender, education, employment, medical history, and use of cardiac medications, which affects the internal validity of the study findings (Ghanbari Afra et al., 2015). Furthermore, as with sexual function, Træen and Olsen (2007) did not use a validated measurement for sexual satisfaction.

Discussion

This integrative review of a limited set of cross-sectional studies revealed that a diverse range of sexual function issues were reported by patients with CAD, including orgasmic, erectile, arousal, and lubrication difficulties, in rates as high as 80-90%. The selected studies examined a constellation of outcomes that were operationally defined with numerous measures, most consistent with the theoretical definitions, but not all adequately validated. However, only two studies measured function and satisfaction concurrently. Overall, the fragmented evidence in this population carries important implications for future development of treatments and interventions, particularly given the large number of CAD patients who experience sexual health issues, and previously discovered positive associations between improvements with sex life and overall quality of life (Flynn & Gow, 2015).

In comparison to other chronic illnesses, especially diabetes and cancer, sexual dysfunction in CAD patients has received considerably less research attention (Rahmanian et al., 2019; Falk & Dizon, 2020). Similar to cancer, patients with CAD desire to return to normal sexual function, but many are hindered by the pathophysiologic ramifications of the disease progression (Steinke et al., 2015). Without a comprehensive understanding of sexual dysfunction in CAD, intervention and treatment research may investigate fruitless paths. This is evidenced by a meta-analysis of interventions for sexual dysfunction in CAD patients, which reported mixed effect sizes and an overall poor quality of evidence (Byrne et al., 2016). Ultimately, constructing a complete representation of the functional issues that men and women face with CAD progression will help identify the optimal targets for intervention.

While men reported sexual problems more frequently, the limited available evidence suggests that women may experience dysfunction more profoundly than men. Interestingly, men tended to have more severe CAD than women in the selected studies, which may explain the disparity in frequency of sexual problems, but fails to account for the disparity in dysfunction severity (Assari et al., 2014). Menopausal status may explain the more severe dysfunction among women; however, only one study assessed menopausal status (Assari et al., 2014). Furthermore, the effects of menopause on sexual function often present in combination with other factors, including hormonal changes, partner function, reproductive history, and medical conditions (Heidari et al., 2019). As such, additional research is needed among both genders, and future studies should consider stratifying participants by CAD severity and menopausal status to provide further insights into the differences in dysfunction among genders.

Despite marked sexual dysfunction, a consistent finding was that sexual satisfaction remained high in CAD populations and was comparable to healthy controls. This may indicate that in coping with CAD, patients attempt to redefine new expectations and perceptions of sexual health while their sexual function worsens to preserve overall sexual satisfaction (Steinke et al., 2015). A previous cohort study of 166 patients with CAD found that coping strategies were pivotal for maintenance of general well-being in adjusting to cardiovascular disease, which may also extend to sexual health issues (Kunschitz et al., 2017). Future research may aim to further investigate this potential relationship.

Several methodologic inadequacies were apparent in the available literature. All identified studies were cross-sectional and so, it is unclear how the trajectory of sexual function and satisfaction evolves over time, which is important to consider given the generally insidious nature of CAD progression. Additionally, six studies provided unclear or unreported diagnostic and sampling procedures, and two studies utilized poorly validated measurements. Overall, studies overwhelmingly targeted specific outcomes of sexual function or satisfaction, with few focusing on a broad biopsychosocial representation. Sexual function is a complex multidimensional construct, and as such it remains a challenge to study empirically. This is exacerbated when multiple different measurements are used to operationalize the same theoretical outcome.

This review highlights the complex operationalization of sexual function into multiple components that are not consistent across studies. This was evidenced by the four different measurements that were used for individual components of sexual function and satisfaction, with only one study capturing a complete multidimensional representation. Furthermore, studies utilizing investigator developed questionnaires did not clearly delineate how their questions were created (Rundblad et al., 2017; Træen & Olson, 2007). Given this complex representation, qualitative work may provide a unique perspective that captures the intricacies of sexuality beyond what can be obtained through a questionnaire. Qualitative literature was excluded from this review given the inadequate quantity of studies needed to synthesize findings, so further research that employs qualitative methods in general CAD populations is needed.

This integrative review revealed several gaps in the current literature alongside the general observation of how little robust literature has been published. First, seven of the included studies were from Middle Eastern countries, with none from North America. This creates a gap in establishing a representation of sexual function in CAD patients of various cultures, with varying perceptions of sexuality (Goossens et al., 2011). Cultural differences in expression of sexuality may provide crucial direction when assessing, counselling, and aiding patients with sexual issues; therefore, further research in other countries is indicated to provide appropriate culturally sensitive sexual care. Second, it is unclear how insidious CAD differs from other cardiac illnesses or acute exacerbations, particularly myocardial infarction. A previous literature review of sexual health in women post-myocardial infarction found similar themes to this review, which included decreased sexual function and sexual activity. This previous review also found a general lack of knowledge regarding resumption of sexual activities (Zeydi et al., 2016). Given that cardiovascular disease consists of multiple conditions outside of CAD, including myocardial infarction and heart failure, future comparative studies between different subpopulations of cardiac patients may better illuminate potential differences in sexual health across cardiac diagnoses.

The results of this integrative review should be considered in the context of several key limitations. First and foremost, the number of published studies in this area was small. Furthermore, most of the captured literature was more than five years old, which implicates the need for up-to-date studies of sexual function and satisfaction in this population. Additionally, one author conducted the search process, and thus it is vulnerable to greater bias compared to a more systematic method. There are also limitations in the critical appraisal of the literature, as the authors did not incorporate an appraisal tool when assessing the scientific rigour of the selected studies. However, meta-analysis was deemed inappropriate given the heterogeneity of measurements and outcomes across studies, along with the general paucity of literature. As such, this review instead followed the steps required of a high-quality integrative review.

Implications for Practice and Research

Nurses play an important role in the management of sexual dysfunction. Sexual dysfunction is classified as a human response to disease processes, and therefore falls within nursing's scope of practice for intervention (Ackley & Ladwig, 2014). Nurses are uniquely positioned to discuss sexual health issues with patients given the extraordinary trust that patients have placed in the nursing profession. However, nurses often lack the knowledge, confidence, and practice to discuss sexual health (Doherty et al., 2011). Previous literature has suggested that continuing education for nurses may include workshops or role-playing to build nurses' knowledge and confidence in discussing sexual health issues (Gazestani et al., 2019). This could also include active reflection of a nurse's personal barriers to discussing sexual concerns, which may include discomfort, lack of knowledge, or embarrassment (Murphy et al., 2018). The findings from this integrative reviewed reinforced that patients who are older are still sexually active, and as such are important to include in conversations about sexual dysfunction. Finally, it is crucial for nurses working with cardiac patients to assess sexual satisfaction, as this constitutes an important component of a holistic representation of sexual health.

Future research should aim to study sexual function and satisfaction using validated, multi-component measures. As mentioned, additional research is needed in diverse populations to stratify by age, gender, race, and cultural background. Furthermore, longitudinal research is needed to better understand overall trends in function and satisfaction with progression of CAD over time. Qualitative research should also be explored to deepen our understanding of the many nuances and intricacies of sexuality, including self-image and general intimacy practices. Lastly, research should aim to identify predictor variables of sexual function and satisfaction, which are critical to create targeted interventions that can be then evaluated, integrated into practice, and ultimately improve sexual health outcomes in CAD patients.

Conclusion

This integrative review provides synthesized sexual function and satisfaction data in the CAD population, along with identified gaps that can be addressed with further research. The current literature has indicated that the landscape of sexual health in this population remains fragmented and under-supported. The key gaps identified from this review were the lack of a consistent definition of sexual health in this population, and a need for additional research with diverse cultures, ages, and CAD severity. Additional sexual function and satisfaction research is vital to establishing evidence-based guidelines for cardiovascular nurses to provide optimal care of sexual health in patients with CAD.

REFERENCES

Ackley, B. J., & Ladwig, G. B. (2014). *Nursing diagnosis handbook: An evidence-based guide to planning care.* Elsevier.

Ashdown, B. K., Hackathorn, J., & Clark, E. M. (2011). In and out of the bedroom: Sexual satisfaction in the marital relationship. *Journal of Integrated Social Sciences, 2*(1), 40–57.

Assari, S., Lankarani, M. M., Ahmadi, K., & Saleh, D. K. (2014). Association between sexual function and marital relationship in patients with ischemic heart disease. *Journal of Tehran University Heart Center, 9*(3), 124–131.

Barsaei, M., Feizollahzadeh, H., Jabbarzadeh, F., Hasankhani, H., & Shabanloei, R. (2020). The meaning of life related to heart disease and its relationship to quality of life after repeat coronary artery angioplasty. *Creative Nursing, 26*(1), 48–55. https://doi.org/10.1891/1078-4535.26.1.48

Berglund, G., Nystedt, M., Bolund, C., Sjödén, P. O., & Rutquist, L. E. (2001). Effect of endocrine treatment on sexuality in premenopausal breast cancer patients: A prospective randomized study. *Journal of Clinical Oncology, 19*(11), 2788–2796. https://doi.org/10.1200/jco.2001.19.11.2788

Byrne, M., Doherty, S., Fridlund, B. G., Martensson, J., Steinke, E. E., Jaarsma, T., & Devane, D. (2016). Sexual counselling for sexual problems in patients with coronary artery disease. *The Cochrane Database of Systematic Reviews, 2,* CD010988. https://doi.org/10.1002/14651858.cd010988.pub2

Corona, G., Jannini, E. A., & Maggi, M. (2006). Inventories for male and female sexual dysfunctions. *International Journal of Impotence Research, 18*(3), 236–250. https://doi.org/10.1038/sj.ijir.3901410

Doherty, S., Byrne, M., Murphy, A. W., & McGee, H. M. (2011). Cardiac rehabilitation staff views about discussing sexual issues with coronary heart disease patients: A national survey in Ireland. *European Journal of Cardiovascular Nursing, 10*(2), 101–107. https://doi.org/10.1016/j.ejcnurse.2010.05.002

Falk, S. J., & Dizon, D. S. (2020). Sexual health issues in cancer survivors. *Seminars in Oncology Nursing, 36*(1), 150981. https://doi.org/10.1016/j.soncn.2019.150981

Flynn, T. J., & Gow, A. J. (2015). Examining associations between sexual behaviours and quality of life in older adults. *Age & Ageing, 44*(5), 823–828. https://doi.org/10.1093/ageing/afv083

Gazestani, T., Shahrbabaki, P. M., Rabori, R. M., & Forouzi, M. A. (2019). Sexual counseling to patients with myocardial infarction: Nurses' performance, responsibility and confidence. *Nursing Practice Today, 6*(4), 212–222. https://doi.org/10.18502/npt.v6i4.1943

Ghanbari Afra, L., Taghadosi, M., & Gilasi, H. R. (2015). Relationship between ischemic heart disease and sexual satisfaction. *Global Journal of Health Science, 8*(1), 263–269. https://doi.org/10.5539/gjhs.v8n1p263

Goossens, E., Norekvål, T. M., Faerch, J., Hody, L., Olsen, S. S., Darmer, M. R., Jaarsma, T., & Moons, P. (2011). Sexual counselling of cardiac patients in Europe: Culture matters. *International Journal of Clinical Practice, 65*(10), 1092–1099. https://doi.org/10.1111/j.1742-1241.2011.02756.x

Heidari, M., Ghodusi, M., Rezaei, P., Kabirian Abyaneh, S., Sureshjani, E. H., & Sheikhi, R. A. (2019). Sexual function and factors affecting menopause: A systematic review. *Journal of Menopausal Medicine, 25*(1), 15–27. https://doi.org/10.6118/jmm.2019.25.1.15

Ibrahim, A., Ali, M., Kiernan, T. J., & Stack, A. G. (2018). Erectile Dysfunction and Ischaemic Heart Disease. *European Cardiology, 13*(2), 98–103. https://doi.org/10.15420/ecr.2017.21.3

Justo, D., Arbel, Y., Mulat, B., Mashav, N., Saar, N., Steinvil, A., Heruti, R., Banai, S., & Lerman, Y. (2010). Sexual activity and erectile dysfunction in elderly men with angiographically documented coronary artery disease. *International Journal of Impotence Research, 22*(1), 40–44. https://doi.org/10.1038/ijir.2009.45

Kałka, D., Karpiński, Ł., Gebala, J., Rusiecki, L., Biełous-Wilk, A., Krauz, E. S., Piłot, M., Womperski, K., Rusiecka, M., & Pilecki, W. (2017). Sexual health of male cardiac patients – present status and expectations of patients with coronary heart disease. *Archives of Medical Science, 13*(2), 302–310. https://doi.org/10.5114/aoms.2017.65332

Kaya, C., Yilmaz, G., Nurkalem, Z., Ilktac, A., & Karaman, M. I. (2007). Sexual function in women with coronary artery disease: A preliminary study. *International Journal of Impotence Research, 19*(3), 326–329. https://doi.org/10.1038/sj.ijir.3901530

Kazemi Saleh, D. K., Pishgou, B., Farrokhi, F., Assari, S., Fotros, A., & Naseri, H. (2008). Gender impact on the correlation between sexuality and marital relation quality in patients with coronary artery disease. *Journal of Sexual Medicine, 5*(9), 2100–2106. https://doi.org/10.1111/j.1743-6109.2007.00724.x

Kriston, L., Gunzler, C., Agyemang, A., Bengel, J., & Berner, M. M. (2010). Effect of sexual function on health-related quality of life mediated by depressive symptoms in cardiac rehabilitation: Findings of the SPARK project in 493 patients. *The Journal of Sexual Medicine, 7*(6), 2044–2055. https://doi.org/10.1111/j.1743-6109.2010.01761.x

Kunschitz, E., Friedrich, O., Schöppl, C., Maitz, J., & Sipötz, J. (2017). Illness perception patterns in patients with coronary artery disease. *Psychology, Health & Medicine, 22*(8), 940–946. https://doi.org/10.1080/13548506.2016.1271439

Larson, J. H., Anderson, S. M., Holman, T. B., & Niemann, B. K. (1998). A longitudinal study of the effects of premarital communication, relationship stability, and self-esteem on sexual satisfaction in the first year of marriage. *Journal of Sex & Marital Therapy, 24*(3), 193–206. https://doi.org/10.1080/00926239808404933

Levin, R. J., Both, S., Georgiadis, J., Kukkonen, T., Park, K., & Yang, C. C. (2016). The physiology of female sexual function and the pathophysiology of female sexual dysfunction (committee 13A). *The Journal of Sexual Medicine, 13*(5), 733-759. https://doi.org/10.1016/j.jsxm.2016.02.172

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group. (2010). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *International Journal of Surgery (London, England), 8*(5), 336–341. https://doi.org/10.1371/journal.pmed.1000097

Mofaraheh Shams, Z., Shah Siah, M., Mohebi, S., & Tabaraee, Y. (2010). The effect of marital counseling on sexual satisfaction of couples in Shiraz city. *Journal of Health System*, *6,* 417–424.

Murphy, P. J., Noone, C., D'Eath, M., Casey, D., Doherty, S., Jaarsma, T., Murphy, A. W., O'Donnell, M., Fallon, N., Gillespie, P., Jalali, A., Sharry, J. M., Newell, J., Toomey, E., Steinke, E. E., & Byrne, M. (2018). The CHARMS pilot study: A multi-method assessment of the feasibility of a sexual counselling implementation intervention in cardiac rehabilitation in Ireland. *Pilot and Feasibility Studies, 4*, 88. https://doi.org/10.1186/s40814-018-0278-4

Oksuz, E., & Malhan, S. (2006). Prevalence and risk factors for female sexual dysfunction in Turkish women. *The Journal of Urology, 175*(2), 654–8. https://doi.org/10.1016/s0022-5347(05)00149-7

Oren, A., Megiddo, E., Banai, S., & Justo, D. (2016). Sexual dysfunction, cardiovascular risk factors, and inflammatory biomarkers in women undergoing coronary angiography. *Journal of Women & Aging, 28*(3), 203–210. https://doi.org/10.1080/08952841.2014.950522

Rahmanian, E., Salari, N., Mohammadi, M., & Jalali, R. (2019). Evaluation of sexual dysfunction and female sexual dysfunction indicators in women with type 2 diabetes: A systematic review and meta-analysis. *Diabetology & metabolic syndrome, 11*, 73. https://doi.org/10.1186/s13098-019-0469-z

Rosen, R. C., Cappelleri, J. C., Smith, M. D., Lipsky, J., & Pena, B. M. (1999). Development and evaluation of an abridged, 5-item version of the International Index of Erectile Function (IIEF-5) as a diagnostic tool for erectile dysfunction. *International Journal of Impotence Research, 11*(6), 319–326. https://doi.org/10.1038/sj.ijir.3900472

Rosen, C., Brown, J., Heiman, S., & Leib, R. (2000). The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex & Marital Therapy, 26*(2), 191–208. https://doi.org/10.1080/009262300278597

Rundblad, L., Zwisler, A. D., Johansen, P. P., Holmberg, T., Schneekloth, N., & Giraldi, A. (2017). Perceived sexual difficulties and sexual counseling in men and women across heart diagnoses: A nationwide cross-sectional study. *The Journal of Sexual Medicine, 14*(6), 785–796. https://doi.org/10.1016/j.jsxm.2017.04.673

Steinke, E. E., Jaarsma, T., Barnason, S. A., Byrne, M., Doherty, S., Dougherty, C. M., Fridlund, B., Kautz, D. D., Mårtensson, J., Mosack, V., & Moser, D. K. (2013). Sexual counseling for individuals with cardiovascular disease and their partners: A consensus document from the American Heart Association and the Esc Council on Cardiovascular Nursing and Allied Professions (CCNAP). *Circulation, 128*(18), 2075–2096. https://doi.org/10.1093/eurheartj/eht270

Steinke, E. E., Mosack, V., & Hill, T. J. (2015). Change in sexual activity after a cardiac event: The role of medications, comorbidity, and psychosocial factors. *Applied Nursing Research, 28*(3), 244–250. https://doi.org/10.1016/j.apnr.2015.04.011

Tavallaii, S. A., Fathi-Ashtiani, A., Nasiri, M., Assari, S., Maleki, P., & Einollahi, B. (2007). Correlation between sexual function and postrenal transplant quality of life: Does gender matter? *The Journal of Sexual Medicine, 4*(6), 1610–1618. https://doi.org/10.1111/j.1743-6109.2007.00565.x

Træen, B., & Olsen, S. (2007). Sexual dysfunction and sexual well-being in people with heart disease. *Sexual & Relationship Therapy, 22*(2), 193–208.

Virani, S. S., Alonso, A., Benjamin, E. J., Bittencourt, M. S., Callaway, C. W., Carson, A. P., Chamberlain, A. M., Chang, A. R., Cheng, S., Delling, F. N., Djousse, L., Elkind, M. S. V., Ferguson, J. F., Fornage, M., Khan, S. S., Kissela, B. M., Knutson, K. L., Kwan, T. W., Lackland, D. T., & Lewis, T. T. (2020). Heart disease and stroke statistics-2020 update: A report from the American Heart Association. *Circulation, 141*(9), e139–e151. https://doi.org/10.1161/cir.0000000000000757

Whittemore, R., & Knafl, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing (Wiley-Blackwell), 52*(5), 546–553. https://doi.org/10.1111/j.1365-2648.2005.03621.x

Wiegel, M., Meston, C., & Rosen, R. (2005). The female sexual function index (FSFI): Cross-validation and development of clinical cut-off scores. *Journal of Sex & Marital Therapy*, *31*(1), 1–20. https://doi.org/10.1080/00926230590475206

Zeydi, A. E., Sharafkhani, M., Armat, M. R., Gould, K. A., Soleimani, A., & Hosseini, S. J. (2016). Women's sexual issues after myocardial infarction: A literature review. *Dimensions of Critical Care Nursing*, *35*(4), 195–203. https://doi.org/10.1097/dcc.0000000000000187