

The Lived Experience of Myocardial Infarction

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This report is submitted in partial fulfilment of the degree of Master of Psychology (Clinical)

School of Psychology

The University of Adelaide

July 2019

Word Count: 4159 (Literature Review), 6925 (Research Report)

Declaration

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July 2019

Acknowledgements

To my incredibly supportive supervisor, Dr. Melissa Oxlad, thank you for the time and guidance you have provided me with throughout the year. Your expertise, patience and persistence, as well as your ongoing encouragement has been greatly appreciated. I am glad that I helped reignite your passion for cardiac research! I would also like to thank Ms Maureen Bell, Research Librarian at the University of Adelaide, for her assistance in developing the logic grids utilised in my study.

To my wonderful family, thank you! Your endless love, support and encouragement means more to me than you will ever know. To my darling mum and dad, where do I even begin? You taught me how to work hard and chase my dreams; all I will ever hope is that I have made you both proud. Lastly, to my fiancé (nearly husband!) Kyle... no one believes in me like you do. Thank you from the bottom of my heart for everything. Without you by my side on this journey, I surely would have caved.

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The Lived Experience of Myocardial Infarction: A Literature Review

Abstract

Cardiovascular diseases (CVDs) are a major cause of death and disability worldwide and include diseases of the heart, vascular diseases of the brain and diseases of the blood vessels. Coronary artery disease (CAD), a specific type of CVD, is a chronic disease which encompasses stable and unstable periods. During unstable periods, vascular wall inflammation and other manifestations of atherosclerosis may cause individuals to develop a myocardial infarction (MI). MI may go undetected, be a minor event in a lifelong chronic disease, or be a major catastrophic event leading to severe cardiac deterioration or sudden cardiac death. Experiencing MI frequently alters an individual's mental representation of self and is often accompanied by mental health concerns including fear, anxiety, worry, depression, grief and loss. Likewise, individuals who experience MI frequently endorse concerns about the social and interpersonal impacts of the condition. Initial research has also identified important variances in how men and women experience MI, with significant implications for future prevention, treatment and rehabilitation. This review aims to identify, analyse and synthesise existing knowledge about individuals' experiences of MI and comment on the gender differences highlighted within the literature.

Keywords: Cardiovascular disease; coronary artery disease; heart disease; myocardial infarction; psychological consequences; gender differences.

Cardiovascular Disease: Introduction, Definition, and Epidemiology

Cardiovascular disease (CVD) is the leading cause of death and disease burden worldwide; accounting for approximately 17.9 million deaths each year and representing approximately 32% of all deaths globally (Madsen & Birkelund, 2016). CVD refers to a heterogeneous group of disorders that affect the heart, brain, and blood vessels and includes coronary artery disease (CAD), cardiomyopathy, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, cardiac arrhythmias, heart failure, deep vein thrombosis and pulmonary embolism (Sanchis-Gomar, Perez-Quilis, Leischik, & Lucia, 2016; World Health Organization [WHO], 2017). CAD, also known as ischaemic heart disease and coronary heart disease (CHD), is the most common form of CVD and in developed countries is a major cause of death and disability; accounting for approximately 7.4 million deaths each year globally (Jayaraj, Davatyan, Priya, & Subramanian, 2018). It is estimated that CVD will claim 23.6 million lives by 2030; hence, it is projected to remain as the leading cause of death worldwide (WHO, 2017). Likewise, the estimated global cost of CVD is expected to increase to \$1044 billion by 2030; an increase from \$863 billion in 2010 (Benjamin et al., 2017; WHO, 2017).

Worldwide the prevalence of CAD is increasing despite regional variations related to influences such as industrialisation, economies, and healthcare system advancements, respectively (Lopez, Mathers, Ezzati, Jamison, & Murray, 2006). While the incidence of CAD in Western civilisations is decreasing, despite many of the risk factors increasing, rates are surging in many developing and transitional countries. It is emphasised throughout the literature that this decline in rates for Western civilisations is a result of strong healthcare systems and ongoing advancements in therapeutic and invasive interventions, collectively (Jayaraj et al., 2018).

Atherosclerosis, a complex pathological process that evolves before an acute event, can be identified as the underlying disease mechanism in the blood vessels that results in CAD (Badimon, Padró, & Vilahur, 2012). Thus, it relates to the cause and subsequent development of CAD (Manfroi et al., 2002). Atherosclerosis can be labelled as a low-grade inflammation of the inner lining of medium- or large-sized arteries that is hastened by a collection of eminent risk factors (Ambrose & Singh, 2015). Over time, fatty material and cholesterol are deposited inside the inner space (lumen) of the arteries. Consequently, gradual thickening of the inner layer of the coronary arteries occurs which, in the case of coronary atherosclerosis, may narrow the lumen of the artery and obstruct blood flow (Ambrose & Singh, 2015). Atherosclerosis, therefore, leads to an inadequate supply of oxygen, and in turn to myocardial hypoxia (Badimon et al., 2012).

Myocardial Infarction

Myocardial infarction (MI) is a key component of the burden of CAD (Roger, 2007). While it appears as the first manifestation of CAD in approximately 50% to 70% of individuals (Abduelkarem, El-Shareif, & Sharif, 2012; Manfroi et al., 2002), it may also occur, repeatedly, in those with established heart disease (Thygesen et al., 2012). When a coronary artery is occluded due to a blood clot (thrombus) on a ruptured atherosclerotic plaque, a severe reduction in blood flow is observed, which results in the supplied area of the heart becoming impeded (Goldstein et al., 2000; Jayaraj et al., 2018). Similarly, angina due to ischemia occurs when the blood flow is decreased due to an artery blockage (Jayaraj et al., 2018). MI can be recognised via electrocardiographic (ECG) findings, elevation in biochemical markers of myocardial necrosis (irreversible cell damage), imaging, or solely by pathology (Bax et al., 2012). Historically, a consensus amongst professionals has existed for MI or coronary infarction. Through studies of disease prevention, the World Health Organisation (WHO) has defined MI in relation to presenting symptoms, ECG abnormalities,

and cardiac enzymes (Bax et al., 2012; Thygesen et al., 2012); however, the recent development of sensitive and myocardial tissue-specific cardiac biochemical markers and imaging techniques has allowed for the detection of minor instances of myocardial injury or necrosis (Thygesen et al., 2012).

Several factors relating to the severity of the disease have been identified including systemic arterial hypertension, smoking status, diabetes mellitus, dyslipidaemia, the number of impaired arteries, and the respective functional impairment of the left ventricle (Abduelkarem et al., 2012; Manfroi et al., 2002). Furthermore, age, gender/sex, abdominal obesity, physical inactivity, high-risk diets (i.e., lack of fruit/vegetables), prolonged excessive alcohol consumption, and psychosocial stressors are also recognised contributory factors (Abduelkarem et al., 2012; Anand et al., 2008; Yusuf et al., 2004). Modifiable risk factors such as diet and physical activity account for over 90% of the risk for acute MI in younger and older individuals, men and women, and across all major ethnic groups (Jayaraj et al., 2018; Yusuf et al., 2004). The risk factors associated with CAD, and MI more specifically, are multifactorial and work synergistically; however, it has not yet been established whether any risk factors participate independently in the instability of plaque triggering an MI (Anand et al., 2008; Manfroi et al., 2002).

Lived Experience of Myocardial Infarction

Individuals who have experienced MI are often forced to cope with the consequences of the disease, such as ongoing symptoms, lifestyle alterations, and treatments/interventions (Jensen & Petersson, 2003; Kristofferzon, Löfmark, & Carlsson, 2003). The disease affects the individual in an abrupt and extremely stressful way and has been described as a threat to one's health and existence that can inspire a life crisis (Eriksson, Asplund, & Svedlund, 2010; Johansson, Swahn, & Strömberg, 2007). As the onset is both acute and unexpected, it is widely accepted by clinicians that the potential for experiencing psychological trauma post-

MI is heightened (Gander & Känel, 2006; Rocha et al., 2008; Staikos, Chalkias, Tsekoura, Iakovidou, & Xanthos, 2017). Reported prevalence rates of Post-Traumatic Stress Disorder post-MI range from 8-30% (Gander & Känel, 2006; Guler et al., 2009; Rocha et al., 2008). Furthermore, feelings such as intense fear, worry, anxiety, and depression are frequently reported in research exploring the psychosocial experiences of patients following MI (Anyadubalu, 2010; Grace et al., 2005; Najafi Ghezeljeh, Yadavar Nikravesh, & Emami, 2014).

In the early discharge phase, individuals who have experienced MI are often worried about their health, social role, and relationships, which can exacerbate symptoms and complicate recovery (Eriksson et al., 2010). Svedlund and Axelsson (2000) investigated the meaning of experiences following MI and reported that patients described experiencing loss of independence and an acute struggle to live normally. Similarly, living in the shadow of fear and limitation and returning to active life were themes uncovered when assessing older patients' perceptions following MI (Falahi-Khoshknab, Hasani, Afrasiabifar, & Yaghmaei, 2008). Najafi Ghezeljeh and colleagues (2014) explored the experiences of patients through a grounded theory approach and reported that patients frequently described changes in their abilities, roles, daily-living, self-identity and their views towards life more generally. These findings are similar to those documented in other qualitative studies (Kristofferzon, Löfmark, & Carlsson, 2007; White, Hunter, & Holttum, 2007).

Throughout the literature, not all experiences of MI are negatively reported. Many studies have delineated positive effects of MI and reported on the adaptive coping processes employed by individuals who have experienced MI (Brink, Karlson, & Hallberg, 2006; Najafi Ghezeljeh et al., 2014). Improved social/interpersonal relationships, a heightened appreciation of life and health, and improved lifestyle are positive consequences of MI that have been reported previously (Najafi Ghezeljeh et al., 2014). Brink and colleagues (2006)

explored individuals' adjustment five-months after an initial MI and observed that the central issue of reorientating the self could be subdivided into categories such as health complaints, illness perception, consequence minimisation, and regaining a sense of control. Likewise, research by Najafi Ghezeljeh and associates (2014) highlighted the transition process to a normal life via three recognisable stages; loss of normal life, coming to terms with the illness, and recreating a normal life.

Health Care and Heart Disease Through a Gender Lens

It is widely recognised that the experience of health care and illness is heavily influenced by patient gender and the hierarchy typically evident in Western medicine (Galick et al., 2015; Medved & Brockmeier, 2011). Consequently, in recent years, gender has received increasing attention in health policies globally. Several studies have determined that gender differences exist in the incidence of symptom presentation, treatment outcomes, morbidity, and prognosis of many diseases (Baggio, Corsini, Floreani, Giannini, & Zagonel, 2013; Coventry, Finn, & Bremner, 2011; Lagro-Janssen, 2007). Unequal access to, and use of, health services is an important contributor to this pattern. Upon presentation to health care facilities, it is regularly noted that the recognition and management of several conditions in women is suboptimal; with many patients often under-diagnosed and under-treated (Park & Merz, 2016; Teunissen, Rotink, & Lagro-Janssen, 2016). Gender differences have also been detected in pain-related communication, which can substantially affect the quality of care experienced (Keogh, 2014). Gender discordance has been suggested to negatively influence patient satisfaction, rapport, adherence to preventative care protocols, and patient-clinician communication (Greenwood, Carnahan, & Huang, 2018).

How CAD, and subsequent MI, is understood in Western culture can substantially influence how individuals interpret their personal risk for the disease (Galick et al., 2015; Lockyer & Bury, 2002). Presently, the healthcare system is shaped by the belief that health

states result from individual behaviour and choice; the influence of the broader social context is seen as secondary (Smith-DiJulio, Windsor, & Anderson, 2010). Consequently, this focus on individual responsibility overlooks that women's health is susceptible to determinants such as inequalities in family care, education, and income, whereas psychological factors have been found to influence men's health more considerably (Denton, Prus, & Walters, 2004; Galick et al., 2015). Thus, typical social roles may prevent women from addressing their health concerns (Smith-DiJulio et al., 2010).

Society's gender constructions of femininity and masculinity may also contribute to how MI is responded to, treated, and subsequently managed in sufferers. Constructions of masculinity are likely to emphasise strength, autonomy, and providing for one's family while constructions of femininity often embrace vulnerability, connection, and caring for others (Galick et al., 2015). This notion has been supported in previous research with participants largely explaining their symptoms and illness in relation to the social expectations associated with their gender. For example, in work by Najafi Ghezeljeh et al. (2014), women referred primarily to their interpersonal relationships, concerns about their housekeeping abilities, and their children. Oppositely, men often focus heavily on their inability to work, be active, problem-solve effectively and demonstrate concern for the future of their family (Tavafian, Gregory, & Montazeri, 2008).

To date, many guidelines and previous studies have predominately focused on biological differences in prevention and treatment (Galick et al., 2015); minimal attention has been given to how societal constructions of masculinity and femininity impact individuals' experiences of MI, treatment and recovery. Hence, over time, increased awareness regarding sex (biological factors) and gender (sociocultural factors) differences related to risk factors and symptom presentation for MI has been observed, and steps have been taken to further

integrate sex and gender in cardiovascular research (Bjørnnes et al., 2018; Hayes, Wood, Mieres, Campbell, & Wenger, 2015).

Symptom Manifestation and Risk Factors. Initial research has noted important variances in how men and women experience MI, with significant implications for future prevention, treatment and rehabilitation (Medved & Brockmeier, 2011). At presentation, females have a significantly altered clinical profile compared with males. Women's symptoms of MI are frequently defined as atypical (Fuochi & Foà, 2018; Hildingh, Fridlund, & Lidell, 2007; Kosuge et al., 2006; Patel, Rosengren, & Ekman, 2004) and may lead to misinterpretation by the woman herself, the woman's family, bystanders, and/or healthcare professionals, often resulting in delayed access to care (Coventry, van Schalkwyk, Thompson, Hawkins, & Hegney, 2017; Lefler & Bondy, 2004; Shin, Martin, & Bryant Howren, 2009). Women are more likely to experience nausea or vomiting, shortness of breath, extreme fatigue, and pain in areas other than the chest (i.e., abdominal, shoulder, or neck pain; Kosuge et al., 2006) than men. Therefore, women are more likely to experience 'silent' or unrecognised MI; the prognosis of which does not differ from symptomatic MI (Wenger, 2003). There is evidence to suggest that coronary risk factors are similar across genders; however, arterial hypertension, diabetes mellitus, and psychological disturbances may be greater risk factors in women compared with men (Kristofferzon et al., 2003). Similarly, pregnancy-related complications (e.g., hypertension, gestational diabetes, pre-eclampsia) significantly increase risk later in life (Anderson & Pepine, 2007).

A biological mechanism of sex-based differences in clinical presentation of CAD, and MI more specifically, has been supported by many studies (Canto et al., 2012). For example, through the Framingham Heart Study, a large long-term, ongoing cardiovascular cohort study considered pivotal in the field, sex-based differences in the initial clinical manifestation of CAD revealed that women were more likely to present with stable or unstable angina, while

men were more likely to attend with MI or sudden cardiac death (Lerner & Kannel, 1986). Epidemiological data have indicated that women are typically 10-20 years older than men at their initial MI (Blomkalns et al., 2005; Canto et al., 2002; Canto et al., 2012) and are relatively spared from clinically significant CAD up to 75-years of age; a difference that is attributed to the protective factors inherent in the reproductive hormone estrogen (Kristofferzon et al., 2003). Despite this, it has also been reported that women who develop coronary atherosclerosis before the age of 75-years may be predisposed to more aggressive heart disease, or may exhibit more risk factors for CAD which could potentially override the protective nature of estrogen (Canto et al., 2012). Several conditions observed only in women also hint at variances in the pathophysiology of CAD between the sexes. Such female-specific conditions include polycystic ovarian syndrome, pre-eclampsia, gestational diabetes, menopause, and peripartum vascular dissection (Anderson & Pepine, 2007). Further indications that may explain differences in CAD outcomes are gender variances in vascular structure; women typically have less compliant and smaller conduit arteries than males (Sheifer et al., 2000). This structural alteration has been observed even when differences in height, weight, and blood pressure are taken into account (Sheifer et al., 2000).

Treatment and Outcomes. Accumulating evidence regarding the treatment and subsequent clinical outcomes for MI suggests disparities that also have a clear relationship to gender (Anderson & Pepine, 2007). Previously, it was proposed that these differences were related to gender biases in the approach to treatment adopted by physicians (Anderson & Pepine, 2007); however, recent advancements in the literature have highlighted that treatment outcomes for MI are vastly different for women compared with men. Previous research has confirmed that medical professionals are more likely to ascribe a lower CAD risk category to female patients when compared with risk-matched male patients, and tend to underestimate the probability of CAD in women (Merz et al., 2017; Mosca et al, 2005). Upon hospital

admission, women are more likely than men to experience accelerated heart rate, pulmonary rales (crackling or rattling lung sounds), atrioventricular block (a problem with heart conduction), and mild-moderate heart failure (Wenger, 2003). Independent of age and other comorbidities, during the hospital stay, women are more likely to have complications such as recurrent chest pain, recurrent ischaemia, shock, heart failure, stroke, and cardiac rupture (Higginson, 2007; Wenger, 2003).

Research aimed at examining the influence of patient gender on intensive care unit (ICU) admission demonstrated inequitable use of intensive care in favour of male patients with MI (Raine, Goldfrad, Rowan, & Black, 2002). The authors reported that physicians relied on more stringent ICU admission standards for female patients with MI, such that male patients experiencing MI admitted to an ICU were significantly younger, in better health, exhibited a less adverse medical history, and were less likely to die in hospital when compared to their female counterparts (Raine et al., 2002). Comparable results were documented by Fowler et al. (2007), who noted that among patients 50-years and older, women appeared less likely to be admitted to an ICU and to receive nominated life-supporting treatments. Conversely, in a study conducted by Butala et al. (2011), it was found that the clinical management of MI was similar across patients; however, substantial differences in care related to gender were exposed. Specifically, women had small, yet significant, deficiencies in the receipt of aspirin within the initial 24-hours of presentation, angiography and anticoagulants during their hospital admission, and statins or aspirin at discharge (Butala et al., 2011). Women were considerably less likely to receive smoking cessation education or counselling but were more likely to have a follow-up appointment scheduled (Butala et al., 2011).

Throughout the literature, it is suggested that the less favourable outcomes observed for women may result from engagement in less aggressive and invasive treatments (Wenger,

2003; Hildingh et al., 2007). This suggestion has been supported by several studies (Jneid et al., 2008; Vaccarino et al., 2005) which aimed to comprehensively analyse data from large national registries to identify associations between sex, medical care and early death following MI. Thus, women are less likely to undergo effective evidence-based treatments, including acute cardiac catheterization, thrombolysis, and percutaneous transcatheter coronary angioplasty (Wenger, 2003).

Women have a well-substantiated higher mortality rate following MI than men, which is regularly attributed to variations in age and attendant comorbidities (Anderson & Pepine, 2007). Canto et al. (2012) reported that women with MI had an overall in-hospital mortality rate of 14.6%, while the rate for men was 10.3%. Recent research conducted by Greenwood and associates (2018) explored several distinct asymmetries in MI mortality due to patient-physician gender concordance. It was discovered that female patients were less likely to survive MI when treated by a male physician, while patients treated by female physicians were more likely to survive, regardless of patient gender (Greenwood et al., 2018). Thus, the apparent disparities in mortality rates disappear when female patients are treated by concordant physicians; a finding that has been documented in research outside the cardiac arena (Gross et al., 2008; Tsugawa et al., 2017).

Typically, women experience a greater decline in quality of life following a cardiac event (Ford et al., 2008). Initially, concerns regarding social support and interpersonal relationships can aggravate symptoms associated with recovery. It has been observed that women are more likely than men to experience adverse psychological outcomes including depression and anxiety, sleep difficulties, psychosomatic complaints (Galick et al., 2015), perceive blunted social support (Medved & Brockmeier, 2011) and they often engage in lower levels of physical activity following MI (Hildingh et al., 2007). Similarly, more women report medical complications following MI, such as ongoing shortness of breath, chest pain,

low physical functioning, fatigue, and emotional distress (Kristofferzon, Löfmark, & Carlsson, 2005). The distress women experience following MI is often associated with sex differences in role strain and available resources; traditional female responsibilities are reflected, as women resume their engagement with household activities early in the recovery period (Hildingh et al., 2007). Furthermore, 1-year post-MI, women have been found to exhibit significantly lower health-related quality of life concerning their social functioning, physical functioning, vitality, mental health and bodily pain (Lacey & Walters, 2003). Johansson and Ekebergh (2006) in examining the meaning of well-being for individuals following MI, discovered that women experience imbalance in life and uncertainty, more so than men. Moreover, in a study of middle-aged women, Plach and Stevens (2001) specified that female's experience of cardiac disease included paradoxical events, feelings, and conditions.

Cardiac Rehabilitation Following Myocardial Infarction

Cardiac rehabilitation (CR) programs are broadly recognised for their ability to improve patients' functional status following cardiac surgery (Feola et al., 2015). The programs promote structured physical exercises and have patients complete secondary prevention (SP) strategies in an attempt to observe an overall reduction in recurrent cardiac events, and encourage improvement in functional and psychosocial status and survival (Alter, Oh, & Chong, 2009; Taylor et al., 2004). Comprehensive education and counselling aimed to address cardiac risk are also often provided to patients (Grace, Grewal, Arthur, Abramson, & Stewart, 2008). CR has been shown to reduce mortality by approximately 25% in cardiac populations (Taylor et al., 2004), to reduce the need for re-hospitalisation, to reduce the use of interventional procedures, and to have advantageous effects on cardiac risk factors, psychosocial well-being, health behaviours, and exercise capacity (Grace et al., 2008), all in a cost-effective manner (Carlson, Johnson, Franklin, & VanderLaan, 2000). While individuals

from both genders exhibit similar benefits from CR and SP interventions (Grace et al., 2008; Todaro, Shen, Niaura, Tilkemeier, & Roberts, 2004), women's lesser participation in programs is extensively problematised in the literature (Allen, Scott, Stewart, & Young, 2004; Angus et al., 2015; Beckie & Beckstead, 2010; Galick et al., 2015; Suaya et al., 2007). Despite CR services significantly reducing the risks of recurrent MI and all-cause mortality, and improving quality of life (Angus et al., 2015; Taylor et al., 2004), women are less likely than men to be referred to CR services or to attend (De Feo et al., 2012; Jackson, Leclerc, Erskine, & Linden, 2005; Suaya et al., 2007). The reasons for this underuse may relate to health system, cultural, and socioeconomic status as well as patient-level factors such as older age, more severe pathology, or programs not meeting their needs (Feola et al., 2015).

The receipt of a referral or a commendation to attend from a medical professional is a consistent predictor of enrolment in CR programs. Allen and colleagues (2004) reported that 80% of female participants who received information about CR from a health professional subsequently enrolled in a program. Nevertheless, only 49% of participants described any knowledge of CR when prompted 6-months post-discharge, and less than 20% reported receiving a referral to enrol in a program (Allen et al., 2004). Being informed about the availability and accessibility of CR services and receiving a referral from a medical professional to enrol appear to be critical predisposing and enabling factors for women to utilise this crucial intervention.

Does the Health Belief Model Explain the Gender Divide?

The Health Belief Model (HBM; Becker, 1974; Janz & Becker, 1984) is a cognitive-behavioural model that attempts to explain and predict an individual's involvement in programs aimed at increasing preventative and health-promoting behaviours (Al-Ali, & Haddad, 2004). According to the HBM, the likelihood that an individual will take action to prevent disease/illness is dependent on the individual's perception that 1) they are vulnerable

to the condition; 2) the consequences of the condition will be significant; 3) the precautionary behaviour will effectively prevent the condition; and 4) the benefits of reducing the threat of the condition exceed the costs of taking action (Rosenstock, 1990). In addition, demographic, sociopsychological (e.g., personality traits, social class, and social pressure) and structural (e.g., knowledge about, or prior contact with, the illness) variables are implicated in an individual's perception, and act as predictors of taking action (Becker, Maiman, Kirscht, Haefner, & Drachman, 1977; Caltabiano, Sarafino, & Byrne, 2008). Further to the four original constructs, health motivation and self-efficacy have also been included in the HBM as a way of predicting health-related behaviour (Al-Ali & Haddad, 2004). Despite this, limited studies have examined the relationship between the model and chronic health problems, such as CAD (see Figure 1).

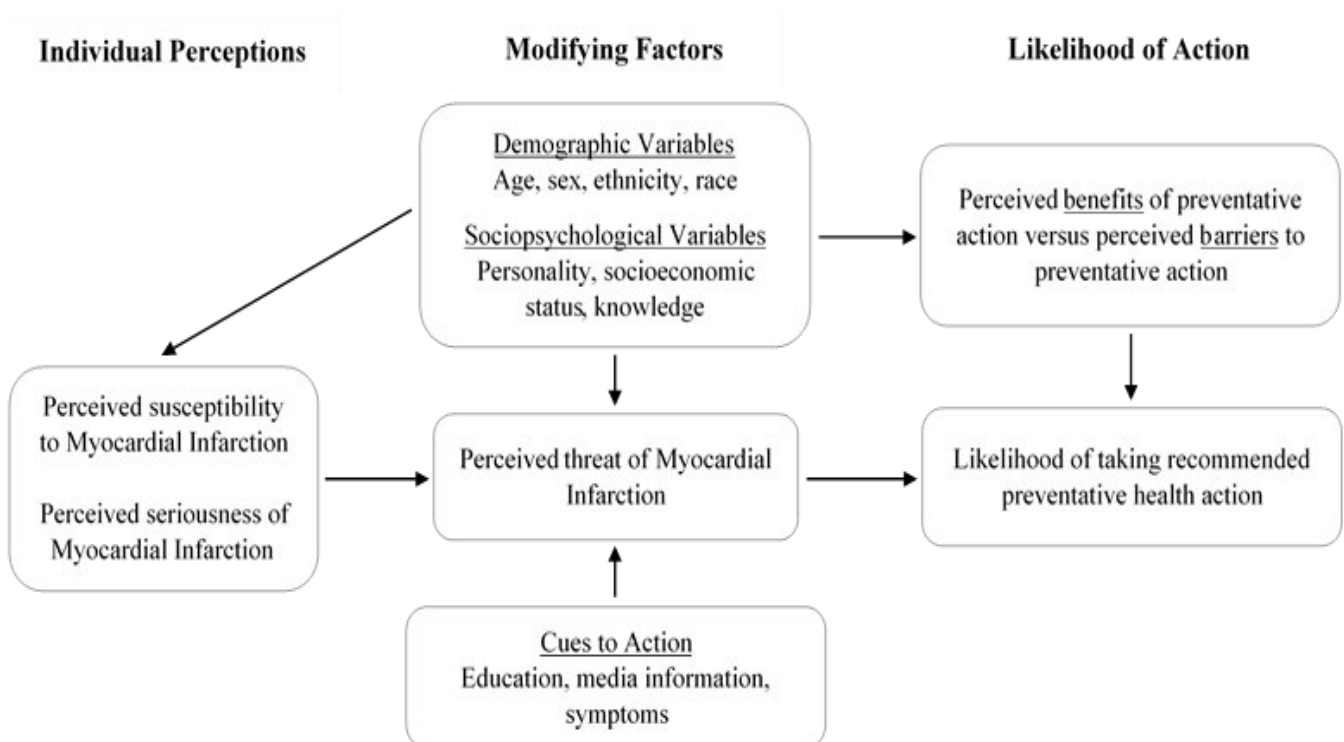


Figure 1. The Health Belief Model (Becker, 1974; Janz & Becker, 1984) adapted to engaging in cardiac care.

Not enough women are aware of the implications of CVD. A national survey commissioned in 1997 by the American Heart Association revealed that only 1 in 3 women

correctly identified heart disease as their leading cause of death (Mosca, Hammond, Mochari-Greenberger, Towfighi, & Albert, 2013). Although subsequent surveys have shown that women's awareness has doubled since 1997, awareness remains inadequate and has not improved significantly since 2006; despite the introduction of campaigns aimed at educating the public (Merz et al., 2017). Women's lack of awareness of susceptibility and candidacy, as per the HBM (see Figure 1), may lead to delays in accessing care or seeking treatment following the development of MI symptoms. Further to this, physicians' perceptions of the relative risk can critically influence their decision-making process regarding health- and treatment-related decisions for female patients, including referral for CR.

Conclusions and Implications for Research and Clinical Practice

Gender neutral research is likely to lead to gender-neutral care and policy while gender-sensitive research may inform gender-sensitive policy and care, which aims to increase the effectiveness and efficiency of services provided to both men and women. Furthermore, optimal recognition and timely management of MI and other cardiac events is critical as the literature suggests these are suboptimal currently. As can be deduced from above, sex-based inequalities in the experience of MI are frequently described but less often explained in the literature. Given this, understanding patients' experiences of their condition is vital for ongoing CAD prevention, research and education. Qualitative methods are particularly suited to gain in-depth knowledge about patients' perceptions of illness and while many studies highlighting the experiences of recovery after MI have relied on qualitative and mixed-method approaches, to date no synthesis of the results has been conducted to examine the psychological effects of experiencing cardiac difficulties on individuals of either gender. Such a synthesis may be particularly prudent given the noted differences in presentation, treatment, and outcomes/experiences following MI. Synthesising the aforementioned findings has crucial implications for knowledge development and clinical practice more broadly.

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**Title**

The Lived Experience of Women Following Myocardial Infarction: A Meta-Synthesis

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Author note: This article is intended for submission to the *British Journal of Health Psychology*. The journal adheres to the American Psychological Association (APA) referencing style (6th Ed.). The journal guidelines specify that the manuscript for qualitative research should be no longer than 6000 words including quotes, excluding the abstract, tables, figures and references. The article has been written for the purpose of the thesis requirements of between 5,000 and 8,000 words.

Abstract

Background and Aims: Myocardial infarction (MI) is a key component of the burden of coronary artery disease worldwide. MI frequently remains underdiagnosed and inadequately in female patients. Accumulating evidence suggests that women experience a greater decline in quality of life following a cardiac event than their male counterparts. Hence, the purpose of this meta-synthesis was to explore the lived experience of women by identifying, analysing and synthesising existing knowledge concerning their experiences of MI. **Methods:** Meta-aggregative techniques were employed to identify key themes related to the physical, psychological, social and rehabilitation-related experiences noted in 63 studies (1994 - 2018). **Results:** The analysis revealed that women's experiences of MI vary considerably; with many recalling that they experienced life-threatening symptoms and feared dying. Many women conveyed their need to make lifestyle modifications following their MI and identified that they were gifted another chance at life. Almost all women valued the physical, psychological and social support that their respective support systems were able to offer them during their journey to recovery. Cardiac rehabilitation was viewed positively by many women in the current study with few studies highlighting the barriers to engagement with rehabilitation services for women post-MI. **Conclusions and Implications:** These findings have widespread interdisciplinary implications for healthcare professionals working within preventative and rehabilitative cardiac care. Likewise, the findings of this study may provide useful guidance for psychologists as they attempt to understand women's experiences during and following MI, support them through their recovery, and optimise their ability to monitor their health and increase their engagement in cardiac rehabilitation programs.

Keywords: Cardiovascular disease; heart disease; myocardial infarction; women's experiences; psychological consequences; cardiac rehabilitation.

Cardiovascular disease (CVD) is a significant cause of mortality and morbidity globally; accounting for approximately 17.5 million deaths each year (Madsen & Birkelund, 2016). While traditionally viewed as a male concern, recent estimates have suggested that in female populations worldwide CVD can account for up to one in every three deaths (Bjørnnes et al., 2018; Galick, D'Arrigo-Patrick, & Knudson-Martin, 2015). Myocardial infarction (MI), the leading cause of mortality in adult women in many industrialised countries (Hildingh, Fridlund, & Lidell, 2007), may appear as the first manifestation of CVD or may occur, repeatedly, in patients with established heart disease (Thygesen et al., 2012). MI relates to a sudden complete occlusion of the coronary artery that supplies oxygen-rich blood to an area of the heart and often results in shortness of breath, nausea, vomiting, and back or jaw pain (Heart Foundation Australia, 2018; Madsen & Birkelund, 2016).

Patient gender and the hierarchy inherent in Western medicine are widely recognised to heavily influence the experience of illness and health care (Galick et al., 2015; Medved & Brockmeier, 2011). To date, guidelines and previous studies have focused predominately on biological differences in the prevention and treatment of MI (Galick et al., 2015); minimal attention has been given to how broader contextual factors such as societal constructions of masculinity and femininity impact individual's experiences, treatment and recovery. Research has identified discrepancies in how men and women experience MI, with several gender inequalities highlighted concerning cardiac care and treatment (Medved & Brockmeier, 2011). There is evidence to suggest that women are less likely than men to be accurately diagnosed with MI or to receive adequate treatment for their condition (Araújo et al., 2018; Higginson, 2007). Likewise, it has been demonstrated that women who are hospitalised for MI undergo fewer major diagnostic and therapeutic procedures than their male counterparts (Hildingh et al., 2007); despite that, they are more likely to die due to post-MI related conditions (Anderson & Pepine, 2007; Higginson, 2007). Accumulating evidence

regarding outcomes following MI also reveals disparities related to gender (Anderson & Pepine, 2007). Although several studies have found the prognosis for has improved over time, overall women's outcomes remain worse when compared with men (Berger et al., 2009), providing a strong rationale for examining sex-based differences in the experience and outcome of acute coronary syndromes, such as MI.

Typically, women experience a greater decline in quality of life following a cardiac event than men (Ford et al., 2008). Initially, concerns regarding their social roles and status, relationships and personal health can exacerbate symptoms and complicate recovery following MI (Eriksson, Asplund, & Svedlund, 2010). It has been observed that women are more likely than men to experience adverse psychological outcomes including depression and anxiety, sleep difficulties, and psychosomatic complaints (Galick et al., 2015), as well as to perceive blunted social support (Medved & Brockmeier, 2011) and engage in lower levels of physical activity following MI (Hildingh et al., 2007). Kristofferzon and colleagues (2003) reviewed, via a meta-analysis, 41 research papers in an attempt to summarise knowledge about gender differences in perceptions of coping and social support among patients who had experienced MI. It was discovered that women with MI have physical, social and medical disadvantages which can influence their perception of recovery following cardiac events (Kristofferzon, Löfmark, & Carlsson, 2003). Household activities were more important to women and aided their recovery while men were more likely to involve their spouses in their recovery (Kristofferzon et al., 2003). Furthermore, resuming work and keeping physically fit were cited as being significant to men while women frequently perceived that they had less social support up to one-year post-MI and reported receiving less information about the disease and rehabilitation (Kristofferzon et al., 2003).

Cardiac rehabilitation (CR) programs are broadly recognised for their ability to promote secondary prevention and alleviate the physiological and psychological impacts of

MI by reducing risks of another infarction, managing symptoms, and allowing patients to regain control of their lives (Daly et al., 2002; Higginson, 2007). Despite evidence that CR following MI can reduce post-MI morbidity and mortality and improve the lives of post-MI patients, research suggests that women are not receiving the care and assistance that is required (Clark, Barbour, White, & MacIntyre, 2004). Although significant strides have been made in raising awareness that MI claims the lives of numerous women every year, the literature suggests that women are more likely not to be enrolled in a rehabilitation program, and those that are, are more likely to drop out of such programs when compared with men (Angus et al., 2015; Beckie & Beckstead, 2010; Higginson, 2007). Consequently, women are a frequently under-represented group in CR programs and, despite often having higher needs, are consistently identified as being less likely to be referred to, or to attend, CR programs (De Feo et al., 2012; Jackson, Leclerc, Erskine, & Linden, 2005; Suaya et al., 2007). The reasons for this underuse may relate to the healthcare system, cultural, and socioeconomic status as well as patient-level factors such as older age, more severe pathology, or programs not meeting their needs (Feola et al., 2015). Research has also demonstrated that gender differences exist within the CR programs that are offered to men and women separately (Beswick et al., 2005).

Despite recent developments in prevention and education for women, regarding heart disease, significant challenges remain (Mosca et al., 2011). Sex-based inequalities in the lived experience of, and life expectancy and quality following, MI are frequently described but less often explained. While many studies highlighting women's experiences of recovery after MI have relied on qualitative methods, to date, no synthesis of the results has been undertaken to examine the psychological effects of experiencing cardiac difficulties. Synthesising the aforementioned findings has significant implications for knowledge development and clinical practice.

The current study aims to better understand the lived experience of women by identifying, analysing and synthesising existing knowledge concerning women's experiences during and following MI. A meta-synthesis of qualitative studies employing meta-aggregative techniques to identify key themes and lines of argument for synthesis will be utilised. With this overarching aim guiding the research, the following research questions will be addressed:

- 1) What physical symptoms, psychological outcomes and social impacts of MI are described by women?
- 2) How do women describe their support needs and the level of support received when having experienced a MI?
- 3) How do women experience and describe the rehabilitation process after experiencing a MI?

Method

Design

There are several evolving approaches for synthesising qualitative research (Barnett-Page & Thomas, 2009). Qualitative meta-synthesis allows researchers the opportunity to review existing research with a contemporary lens and ask new, critical questions of the data to construct new interpretations (Kent & Fineout-Overholt, 2008). In the current study, a meta-aggregative approach was adopted. Meta-aggregation was developed as a method of qualitative synthesis designed to mirror the Cochrane process of quantitative synthesis while being sensitive to the contextual nature of qualitative research and its traditions (Munn, Tufanaru, & Aromataris, 2014).

Meta-aggregative approaches are sensitive to the practicality and usability of primary authors' findings and do not seek to re-interpret those findings as with some other methods of qualitative synthesis. A strong feature of meta-aggregative approaches is that they seek to

enable generalisable statements, in the form of recommendations, to be developed to guide health professionals and policymakers (Hannes & Lockwood, 2011). Thus, meta-aggregation is in contrast to meta-ethnography and the critical interpretive approach to qualitative synthesis, which focus on re-interpretation and theory generation rather than aggregation (Munn et al., 2014).

Search Strategy

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed throughout the review process (Liberati et al., 2009). Eight electronic databases (CINAHL, Embase, ProQuest Global Theses, PsychINFO, PubMed, Scopus, Sociological Abstracts, and Web of Science) were systematically searched from database inception until October 2018 to identify qualitative studies that have examined women's lived experience of MI. In addition, alerts were created to ensure any studies published after the initial search were also identified and examined for possible inclusion. A search strategy combining controlled vocabulary and free-text search terms was created and adapted as appropriate for each database (see Appendix A). A research librarian was also consulted to improve the relevance and accuracy of search terms. Additionally, a manual search of the reference lists of included papers was undertaken to identify further potentially relevant material.

Eligibility Criteria and Study Selection

Papers were selected for inclusion if they (i) investigated the lived experience of MI for women (papers that included the perspectives of both female and male participants or examined the lived experience of various cardiac events were eligible for inclusion if qualitative data were reported separately and in detail), (ii) reported primary data, and (iii) presented analysis of qualitative data (mixed methods papers were eligible for inclusion if qualitative data were reported separately and in detail). Additionally, only peer-reviewed

research written in English was permitted. Editorials, book reviews and conference abstracts were excluded. For this research, female was defined as the sex given at birth.

As noted previously, PRISMA guidelines were adhered to for this meta-synthesis (Figure 2; Liberati et al., 2009). The initial search resulted in 14450 identified studies. A total of 7256 duplicate citations were removed leaving 7194 records to be screened by title and abstract. Applying inclusion and exclusion criteria to determine eligibility, 6906 studies were excluded; the full texts of 288 studies were retrieved and assessed against the inclusion criteria; 225 studies were excluded as they either did not meet the inclusion criteria ($n = 198$), or the full text was unable to be retrieved ($n = 27$; 17 authors for whom contact details were available were contacted for access to their research but no responses were received). Thus, 63 qualitative studies were eligible for inclusion and assessed for methodological quality. Following appraisal, all 63 studies were included in the meta-synthesis.

To limit data-selection bias, the author (SLM) and a second researcher (MO) reviewed a randomly selected sample of 360 potentially eligible articles (5% of title and abstract screening). Interrater agreement was high (99%, $K=.89$, $p<.05$) with any discrepancies resolved by consensus discussion.

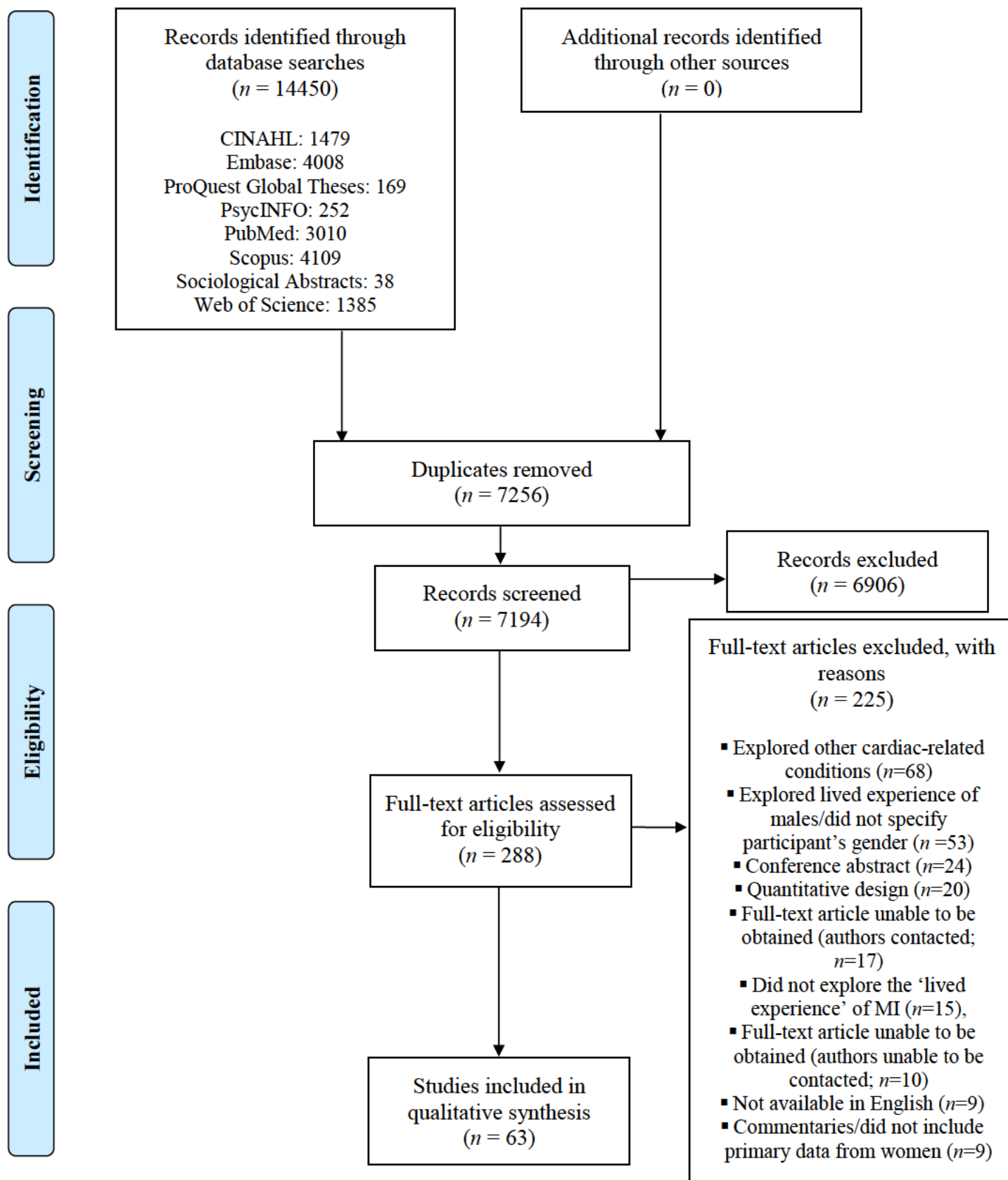


Figure 2. PRISMA flow diagram (Liberati et al., 2009) demonstrating the article selection and screening process.

Quality Appraisal

The quality of eligible papers was appraised independently by the author (SLM) and a second researcher (MO) using the Critical Appraisal Skills Programme (CASP) qualitative research checklist (CASP, 2018). This method of appraisal considers the credibility and rigour of relevant studies under the following categories: research design, recruitment, data collection, researcher-participant relationship, ethical issues, data analysis, findings and value of the research. The CASP has been favourably compared with other appraisal tools throughout the literature (e.g., Angus et al., 2015; Feder, Hutson, Ramsay, & Taket, 2006; Malpass et al., 2009). A three-point system was used by the author (SLM) and a second researcher (MO) to rate each paper on how it explained each of the eight areas (weak = 1, moderate = 2, strong = 3; Coffey et al., 2016; Duggleby et al., 2010). Scores were then summed for each paper, giving a possible score of 9-27. Variances in assessment were resolved through reviewer discussion. The review of quality was conducted to aid readers' critical consideration of the credibility of the included papers' methods and findings, and as such, no papers were excluded following the synthesis. Importantly, evaluations on CASP criteria often reflect the quality of reporting rather than the quality of the research undertaken; thus, CASP scores do not necessarily indicate the trustworthiness, robustness, or transferability of the study's findings (Atkins et al., 2008; Tong, Flemming, McInnes, Oliver, & Craig, 2012).

Data Extraction and Synthesis

Adhering to PRISMA guidelines, a purposely designed data extraction form was developed to gather study characteristics and relevant findings from included studies (see Appendix B). The extraction sheet summarised key information from each study such as (i) sample characteristics (e.g., sample size, age range and mean), (ii) cardiac event characteristics (e.g., event type, number of cardiac events, age at event, time since event), (iii)

study characteristics (e.g., study aim, design, inclusion/exclusion criteria, recruitment source), and (iv) lived experience.

Where possible, findings were extracted verbatim as themes identified by authors of the primary studies and additionally excerpts to illustrate the findings were gathered. Where included studies did not present identifiable themes, findings, in the form of definitive statements made by authors, were extracted from the narrative after discussion by the two author (SLM) and a second researcher (MO). All findings were assigned a level of credibility: unequivocal (U) - evidence beyond reasonable doubt, such as directly reported or observed findings clearly derived from qualitative data and not open to challenge; credible (C) – findings that were plausible interpretations, given the presented data and theoretical framework; and unsupported (Un) – findings that were not supported by the presented data (Aromataris & Munn, 2017). Only unequivocal and credible findings were included in the meta-synthesis (Aromataris & Munn, 2017). Data were synthesised using a meta-aggregative approach, where findings were grouped into categories based upon similarity of meaning. Categories were then aggregated again according to similarity of meaning to produce a set of synthesised findings.

Results

Study Characteristics

A summary of the key characteristics of each included study are provided in Table 1. The papers ranged in date from 1994 to 2018 and originated from Sweden ($N_{studies} = 21$), the United States of America ($N_{studies} = 19$), the United Kingdom ($N_{studies} = 8$), Canada ($N_{studies} = 7$), Denmark ($N_{studies} = 2$), Australia ($N_{studies} = 2$), New Zealand ($N_{studies} = 1$), Croatia ($N_{studies} = 1$), Italy ($n = 1$), and Oman ($N_{studies} = 1$). Qualitative data were collected via interviews ($N_{studies} = 61$; 2 including observation) and focus groups ($N_{studies} = 2$). Data were analysed via content analysis (including grounded theory framework approaches; $N_{studies} = 38$),

phenomenological analysis ($N_{studies} = 17$), thematic analysis ($N_{studies} = 5$), constant comparative method ($N_{studies} = 2$), and ethnography ($N_{studies} = 1$).

Table 1

Characteristics of Included Studies (N_{studies} = 63)

Author/Reference	Country	Sample Size	Recruitment Source	Methodology	
				Data Collection	Data Analysis
Abramsohn et al. (2013)	USA	17	TRIUMPH study registry	Semi-structured, qualitative telephone interviews	Grounded theory and content analysis
Albarran et al. (2007)	UK	12	CCU in south-west England	In-depth, semi-structured interviews	Content analysis
Ammouri et al. (2017)	Oman	5 (1 female)	CCU in tertiary hospital in Amman	In-depth, semi-structured interviews	Inductive content analysis
Arslanian-Engoren (2005)	USA	10	CCU in Midwest tertiary care hospital	Semi-structured, feminist, poststructuralist interviews	Content analysis
Arslanian-Engoren et al. (2016)	USA	14	Midwestern association related to heart health promotion, UMClinicalStudies website, and a large, tertiary care affiliated CR centre	Focus groups	Content analysis
Bowles (2013)	USA	8	Cardiology clinics and community health centre in Arizona	Semi-structured interviews	Content analysis
Bowles et al. (2018)	USA	8	Cardiology clinics and community health centre in Arizona	Semi-structured interviews	Content analysis

Author/Reference	Country	Sample Size	Recruitment Source	Methodology	
				Data Collection	Data Analysis
Brink (2009)	Sweden	19 (10 females)	Swedish rural hospital	Semi-structured interviews	Grounded theory
Brink et al. (2002)	Sweden	22 (11 females)	CCU at Uddevalla Hospital	Semi-structured interviews	Grounded theory
Brink et al. (2006)	Sweden	21 (11 females)	Swedish rural hospital	Semi-structured interviews	Grounded theory
Caldwell et al. (2005)	Canada	12	Communities in rural south-west Canada	In-depth, semi-structured interviews	Critical ethnography
Crane et al. (2003)	USA	15	St. Vincent Infirmiry Medical Centre	In-depth interviews	Content analysis and Ethnograph 4.0 computer program
Day et al. (2006)	NZ	10	Two NZ North Island Hospitals	In-depth, semi-structured interviews	Grounded theory
Dempsey et al. (1995)	USA	16	CCU of large community hospital on the west coast	In-depth, structured interviews	Constant comparative method
Doiron (1998)	Canada	8	Two CCU's and two medical, cardiac stepdown units in two acute care regional hospitals	Semi-structured, feminist interviews	Thematic analysis
Esbai (2004)	USA	20	Outpatient cardiac clinic in metropolitan Chicago	Semi-structured interviews	Constant comparative method
Fors et al. (2014)	Sweden	12 (5 females)	Two CCU's in a tertiary hospital in western Sweden	In-depth interviews	Phenomenological hermeneutic approach

Author/Reference	Country	Sample Size	Recruitment Source	Methodology	
				Data Collection	Data Analysis
Fredriksson-Larsson et al. (2013)	Sweden	18 (5 females)	Rural regional hospital in western Sweden	In-depth interviews	Constructivist grounded theory
Fuochi et al. (2018)	Italy	57	Three cardiology departments and two clinical institutes in Italy	Semi-structured interviews	Thematic analysis
Galdas et al. (2010)	Canada	15 (5 females)	Hospital-based CR education program in an urban centre of British-Columbia	In-depth interviews	Thematic analysis
Gyberg et al. (2016)	Sweden	17	CCU in Swedish hospital	In-depth interviews	Grounded theory
Herning et al. (2011)	Denmark	14	Cardiology department in Copenhagen university hospital	In-depth interviews	Phenomenological analysis
Higginson (2007)	UK	25	CR program in three hospitals in South Wales	In-depth, semi-structured interviews and structured observation	Feminist grounded theory
Holliday et al. (200)	Australia	16	CCU and cardiology ward in John Hunter hospital	Semi-structured interviews	Content analysis
Hughes (1997)	USA	12	Five private cardiology group practices in a large metropolitan area in the south-west region of the USA	Unstructured interviews	Phenomenological analysis

Author/Reference	Country	Sample Size	Recruitment Source	Methodology	
				Data Collection	Data Analysis
Isaksson et al. (2013)	Sweden	20	CCU's in three hospitals in northern Sweden	In-depth interviews	Content analysis
Jackson et al. (2000)	Australia	10	Large public hospital in Sydney	Open-ended, semi-structured interviews	Feminist grounded theory
Johansson et al. (2003)	Sweden	8	Patient's association	In-depth interviews	Phenomenological analysis
Johansson et al. (2006)	Sweden	8	CCU in Swedish hospital	Open-ended, semi-structured interviews	Content analysis
Junehag et al. (2014)	Sweden	20 (6 females)	Referred by coronary care nurse during a follow-up visit 2-weeks post-discharge	Semi-structured interviews	Content analysis
Junehag et al (2014b)	Sweden	20 (6 females)	Referred by coronary care nurse during a follow-up visit 2-weeks post-discharge	Semi-structured interviews (two completed by telephone)	Content analysis
Kerr (1999)	Canada	7	Two cardiology units in a large Canadian metropolitan teaching hospital and a referral centre for the treatment of cardiac illness	In-depth, unstructured, interactive interviews	Phenomenological hermeneutic approach
Kristofferzon et al. (2007)	Sweden	39 (20 females)	Hospital in central Sweden	Semi-structured interviews	Content analysis
Kristofferzon et al. (2008)	Sweden	39 (20 females)	Hospital in central Sweden	Semi-structured interviews	Content analysis

Author/Reference	Country	Sample Size	Recruitment Source	Methodology	
				Data Collection	Data Analysis
Lee (2015)	USA	18	Two university hospitals	Semi-structured interviews	Grounded theory
Lichtman et al. (2015)	USA	30	TRIUMPH study registry	In-depth interviews	Thematic analysis
MacInnes (2006)	UK	10	Three district general hospitals in south-east England	Semi-structured interviews	Thematic analysis
McSweeney (1998)	USA	20	Three medical centres in central Texas	Intensive interviews	Content analysis
McSweeney et al. (2000)	USA	40	Three medical centres	In-depth interviews	Content analysis
McSweeney et al. (2001)	USA	40	Acute care setting	In-depth interviews	Content analysis
Milner (1994)	USA	4	CR program in New England medical centre	Unstructured interviews	Phenomenological analysis
Olson (2006)	USA	3	Midwestern cardiology practice	Unstructured interviews	Phenomenological analysis
Petriček et al. (2017)	Croatia	30 (14 females)	General practice (GP)	Semi-structured interviews	Grounded theory
Pullen et al. (2009)	UK	8	Gloucestershire Royal Hospital and Cheltenham General Hospital	Semi-structured interviews	Phenomenological analysis
Quigley (2002)	USA	13	CR site in New England	Intensive interviews and observation	Content analysis
Sherwood et al. (2011)	UK	10 (1 MI specific)	Gloucestershire CR program	Semi-structured interviews	Phenomenological analysis

Author/Reference	Country	Sample Size	Recruitment Source	Methodology	
				Data Collection	Data Analysis
Sjostrom-Strand et al. (2006)	Sweden	20	CCU in a tertiary hospital in southern Sweden	In-depth, semi-structured interviews	Phenomenological analysis
Sjostrom-Strand et al. (2008)	Sweden	19	CCU in a tertiary hospital in southern Sweden	In-depth, semi-structured interviews	Content analysis
Sjostrom-Strand et al. (2011)	Sweden	12	CCU in a tertiary hospital in southern Sweden	In-depth, semi-structured interviews	Phenomenological analysis
Søderberg et al. (2013)	Denmark	11	Two hospital heart centres	Semi-structured interviews	Phenomenological hermeneutic approach
Sundler et al. (2009)	Sweden	10	CCU in Swedish hospital	Semi-structured interviews	Phenomenological analysis
Sutherland et al. (2000)	Canada	11	Two tertiary care hospitals	Unstructured and semi-structured interviews	Content analysis
Sutherland (1997)	Canada	11	University of Alberta Hospital and Royal Alexandra Hospital	In-depth, semi-structured interviews	Content analysis
Svedlund et al. (2000)	Sweden	9	CCU in Swedish hospital (located in Östersund)	Personal narrative interviews	Phenomenological hermeneutic approach
Svedlund et al. (2004)	Sweden	9	CCU in central Swedish hospital	Personal narrative interviews	Phenomenological hermeneutic approach
Svedlund et al. (2001)	Sweden	10	CCU in northern Swedish hospital	Personal narrative interviews	Phenomenological hermeneutic approach
Tobin (1996)	Canada	12	Three acute care agencies	Unstructured interviews	Grounded theory

Author/Reference	Country	Sample Size	Recruitment Source	Methodology	
				Data Collection	Data Analysis
Tod (2008)	UK	34 (15 females)	Three ex-mining communities in North England	Semi-structured individual and group interviews	Constructivist grounded theory
Turman (1996)	USA	7	Hospital in Virginia	Structured interviews	Content analysis
Vale (1997)	USA	31 (16 females)	Two metropolitan hospital databases	Focus groups	Content analysis
White et al. (2007)	UK	5	Hospital database	Semi-structured interviews	Phenomenological analysis
Wieslander et al. (2016)	Sweden	26	Ten hospitals geographically distributed in southern and central Sweden	Unstructured interviews	Content analysis
Wiles (1998)	UK	25 (12 females)	Two metropolitan hospitals (piloting primary care intervention)	In-depth, semi-structured interviews	Grounded theory

Note. CCU = Coronary Care Unit; CR = Cardiac Rehabilitation; MI = Myocardial Infarction; NZ = New Zealand; TRIUMPH = Translational Research Investigating Underlying Disparities in Acute Myocardial Infarction Patients' Health Status Registry; UK = United Kingdom; USA = United States of America.

Participant Characteristics

The total sample consisted of 858 women ($N_{studies} = 63$). Participants were aged between 27 and 89 years ($M = 63.12$ years; $SD = 17.31$), based on 354 participants ($N_{studies} = 30$). The number of MIs experienced by women ranged between 1 and 3 ($M = 1.07$; $SD = 0.28$). A summary of the main participant demographic characteristics are provided in Table 2.

Table 2

*Characteristics of Participants in Included Studies**

Variable	N_{studies}	$N_{\text{participants}}$	M (SD)	Range
Age	30	354	63.12 (17.31)	27 - 89
Not supplied	33	504		
Number of Mis			1.07 (0.28)	
1	39	499		
2	12	33		
3	2	3		
Length of Time Since MI				
0 – 12 months	44	540		
13 – 24 months	4	37		
25 – 36 months	4	29		
> 36 months	3	42		
Ethnicity				
European/Caucasian	23	251		
African American	10	38		
Asian	1	18		
Hispanic	5	27		
Other	9	37		

Variable	N_{studies}	$N_{\text{participants}}$	M (SD)	Range
Relationship Status				
Single/Never Married	21	106		
Married/In a relationship	44	397		
Divorced	17	57		
Widowed	19	73		
Level of Education				
< 12 years	19	226		
>12 years	16	134		

Note. N_{studies} = number of studies; $N_{\text{participants}}$ = number of participants; M = Mean; SD = standard deviation; MI = Myocardial Infarction.

* not all studies provided this data for their participants.

Quality Appraisal

The 63 included studies were of moderate to high quality and possessed scores ranging from 22 to 27 ($M = 25.10$, $SD = 1.43$) on the CASP checklist (see Table 3). Forty-six papers (73%) did not address the possible influence of the researcher on the study or the influence of the study on the researcher, while eight studies (12%) did not adequately comment on ethical issues that arose during testing.

Table 3

Evaluation of Methodological Quality of Included Studies (N_{studies} = 63)

References	Critical Appraisal Skills Programme Criteria									
	Aims	Methodology	Design	Sample	Data Collection	Researcher Bias	Ethical Considerations	Data Analysis	Findings	Total
Abramsohn et al. (2013)	●	●	◐	●	●	○	●	●	●	24/27
Albarran et al. (2007)	●	●	●	●	●	○	●	●	●	25/27
Ammouri et al. (2017)	●	●	●	●	●	○	●	●	●	25/27
Arslanian-Engoren (2005)	●	●	◐	●	●	○	●	●	●	24/27
Arslanian-Engoren et al. (2016)	●	●	◐	●	●	○	◐	●	●	23/27
Bowles (2013)	●	●	●	●	●	●	●	●	●	27/27
Bowles et al. (2018)	●	●	●	●	●	◐	●	●	●	26/27
Brink (2009)	●	●	●	●	●	○	●	●	●	25/27
Brink et al. (2002)	●	●	●	●	◐	○	◐	●	●	23/27
Brink et al. (2006)	●	●	●	●	●	○	●	●	●	25/27
Caldwell et al. (2005)	●	●	●	●	●	○	●	●	●	25/27
Crane et al. (2003)	●	●	◐	◐	●	○	◐	●	●	22/27
Day et al. (2006)	●	●	◐	●	◐	○	●	●	●	23/27
Dempsey et al. (1995)	●	●	●	●	●	○	●	●	●	25/27
Doiron (1998)	●	●	●	●	●	●	●	●	●	27/27
Esbai (2004)	●	●	●	●	●	●	●	●	●	27/27
Fors et al. (2014)	●	●	●	●	●	○	●	●	●	25/27

References	Critical Appraisal Skills Programme Criteria									
	Aims	Methodology	Design	Sample	Data Collection	Researcher Bias	Ethical Considerations	Data Analysis	Findings	Total
Fredriksson-Larsson et al. (2013)	●	●	●	●	●	○	●	●	●	25/27
Fuochi et al. (2018)	●	●	●	●	●	○	●	●	●	25/27
Galdas et al. (2010)	●	●	●	●	●	○	●	●	●	25/27
Gyberg et al. (2016)	●	●	●	●	●	○	●	●	●	25/27
Herning et al. (2011)	●	●	●	◐	◐	○	●	●	●	23/27
Higginson (2007)	●	●	●	●	●	●	●	●	●	27/27
Holliday et al. (2000)	●	●	●	●	●	○	●	●	●	25/27
Hughes (1997)	●	●	●	●	●	●	●	●	●	27/27
Isaksson et al. (2013)	●	●	◐	●	●	○	●	●	●	24/27
Jackson et al. (2000)	●	●	●	●	●	○	●	●	●	25/27
Johansson et al. (2003)	●	●	●	◐	●	○	●	●	●	24/27
Johansson et al. (2006)	●	●	●	●	◐	◐	●	◐	●	24/27
Juneag et al. (2014)	●	●	●	●	●	○	●	●	●	25/27
Juneag et al. (2014b)	●	●	●	●	●	○	●	●	●	25/27
Kerr et al. (1999)	●	●	●	●	◐	○	●	●	●	24/27
Kristofferzon et al. (2007)	●	●	●	◐	●	◐	●	●	●	25/27
Kristofferzon et al. (2008)	●	●	●	●	◐	◐	●	●	●	25/27
Lee (2015)	●	●	●	●	●	●	●	●	●	27/27
Lichtman et al. (2015)	●	●	●	●	●	○	○	●	●	23/27
MacInnes (2006)	●	●	◐	●	◐	○	●	●	●	23/27
McSweeney (1998)	●	●	◐	●	●	○	●	●	●	24/27

References	Critical Appraisal Skills Programme Criteria									
	Aims	Methodology	Design	Sample	Data Collection	Researcher Bias	Ethical Considerations	Data Analysis	Findings	Total
Vale (1997)	●	●	●	●	●	●	●	●	●	27/27
White et al. (2007)	●	●	●	●	●	○	◐	◐	●	23/27
Wieslander et al. (2016)	●	●	●	●	●	◐	●	●	●	26/27
Wiles (1998)	●	●	●	●	●	○	○	●	●	23/27

Note. ● present (score of 3); ◐ present, with some limitations or unable to determine (score of 2); ○ not present (score of 1).

Synthesised Findings

Physical symptoms. The meta-synthesis of the prodromal and MI symptom experience of women was derived from 18 studies that were grouped into seven categories (Table 4), to provide the overall synthesised finding: “Preconceived expectations, prior knowledge, unanticipated, misinterpreted symptoms, and reluctance to engage with healthcare professionals influence women’s physical experiences of MI”.

Despite endorsing many well-known risk factors related to MI, the majority of women did not perceive themselves as vulnerable to experiencing a MI. Women exhibited similar inaccurate preconceived ideas regarding the symptoms typically associated with MI; as one woman explained: *“I would hear (from my sister about her husband) that the arm pain and numbness is what you get with a heart attack, and I did not get that. I did not have any pain in my arms”* (Bowles, McEwen, & Rosenfeld, 2018, p. 65). Disparities between actual and expected MI symptoms often resulted in women attributing their MI symptoms to noncardiac causes such as stress, weight gain and the natural consequences of aging. While the number and severity of prodromal and acute symptoms experienced by women varied significantly, unusual fatigue, shortness of breath, discomfort near the shoulder blade, and unfamiliar chest sensations were among the most frequently cited. The vast majority of women experienced several prodromal symptoms which evolved over weeks and up to 2-years prior to MI (McSweeney & Crane, 2000).

The indistinct pain and unusual sensations often became intruded in women’s lives, and women toned down their symptoms in an effort to live their daily life as usual (Isaksson, Brulin, Eliasson, Näslund, & Zingmark, 2013). In response to their symptoms, many women interpreted their inability to cope with their usual routines as a sign of weakness, and they felt ashamed. Consequently, some women appeared to be caught between their desire to maintain control and the realisation that they may have been experiencing a serious condition that

required medical attention. Despite substantial discomfort, some women described waiting several hours with severe symptoms while attempting to self-manage their symptoms. Work and family responsibilities, as well as concerns about how family members would respond to their change in health status, persisted even as women's symptoms escalated (Lichtman et al., 2015). In some instances, their direct and indirect experiences with MI through other channels (i.e., family member experiences) acted as a catalyst for them to seek help; however, many women did not seek medical attention because of the unusual and intermittent manifestation of their symptoms (Albarran, Clarke, & Crawford, 2007). Incorrectly attributing MI symptoms to noncardiac origins and fear of experiencing potential embarrassment if, upon presentation, it was a false alarm were also key contributing factors for women's delays in engaging with health care services.

Of those women who sought medical attention on the recommendation of others, or because they felt something was wrong, several were sent home without a diagnosis or exploratory testing. Such encounters occurred with the presentation of both typical and atypical acute symptoms (Lichtman et al., 2015). One woman emphasised that she felt ignored because *“a doctor looked and felt and he was like, he did not think it was the heart, but he believed it was the stomach, so he said I should just go home and be glad that it was nothing serious. But it was serious”* (Isaksson et al., 2013, p. 364).

Following their MI, women often experienced uncertainty due to fear of suffering a second MI and ongoing symptoms which they were unable to accurately interpret. Symptoms of chest pain experienced after hospitalisation were often feared to be another MI. Some women described that, since suffering their MI, they were aware of having their heart and also how their heart was beating at different times; *“I am very aware of my heart. You're not usually aware of your internal organs but I am really aware of my heart, that it's beating all*

the time, I can feel that it's moving, I feel my chest. I am really aware of my heart. And that has come since the illness" (Sjöström-Strand, Ivarsson, & Sjöberg, 2011, p. 463).

Psychological outcomes and social impact. This meta-synthesis was derived from 37 studies that were grouped into six categories (Table 4), to provide the overall synthesised finding: "Facing new realities, living a different life, confronting mortality, and re-assessing priorities are pivotal to aiding women's psychological and physical recovery post-MI".

Recovery was presented as a complex process initially characterised by fear, uncertainty, and denial. Feelings of sadness, hopelessness and loss of strength in daily life were also experienced by women following MI with many expressing worries over their inability to independently perform their activities of daily living. Many women acknowledged they could no longer rely on their bodies, which was viewed as a hindrance when they attempted to move on with their lives. In response to this, feelings of anger, frustration, sadness and loss were all described by women when contemplating their restricted abilities and perceived loss of independence (White, Hunter, & Holtum, 2007). Moreover, symptoms of depression were heightened in the first few weeks following MI when women's physical limitations were most severe.

Many women grappled with a sense of 'watchful insecurity' as they worked to regain previous feelings of security (Fredriksson-Larsson, Alsen, & Brink, 2013). They reported a lack of trust in their bodies and sharpened awareness that stemmed from the fear of experiencing another MI. Descriptions of preoccupation and watchfulness were also common, with countless women feeling unsafe, perilous, and susceptible to future MIs (Tod, 2008). While many women became hypervigilant, some experienced this insecurity as a sense of increased affirmation; they confirmed that it allowed them to contemplate their priorities and experience an increased strength of character. Women frequently described the terror of being so close to death, and many vividly described the dread they felt knowing death was so

near (Tobin, 1996). They often expressed gratefulness for being alive and reflected on what they considered to be a blessing. Women highlighted their gratitude at being given a second chance at life, and a belief in feeling lucky was frequently cited; *“I feel well and I’m grateful that I’m alive today. I try to live like anyone else. Perhaps I stress myself a bit too much. The will to survive was a major factor in motivating and empowering lifestyle changes”*

(Sjöström-Strand et al., 2011, p. 463). Moreover, for many women, a new clarity about the future developed, and they gained a sense of direction, which had not been present at other times in their life. Many exhibited increased appreciation of the things they had yet to do in life, and a sense of urgency was found in that they reprioritised things they wanted to accomplish.

Women often spent an extensive amount of time and energy considering the cause of, and explanation for, their disease. Genetics and several lifestyle factors such as smoking, obesity, poor health, and chronic stress, were self-evident as potential causes of the disease. Beliefs of unfairness were also described; one woman questioned: *“why is it that I, in particular, have been affected by this...”* (Fors, Dudas, & Ekman, 2014, p. 434). Many women suggested that it would be beneficial if they received an explanation for their MI, something to blame it on, even if they were to blame (Vale, 1997). Some reflected on plausibly related symptoms and their health histories in an attempt to understand the change within their lives. Overall, developing such an understanding related to change was necessary for many women as they struggled to regain a sense of control in their lives (Sutherland & Jensen, 2000).

Suffering from MI altered the personality, emotional well-being and lifestyle of countless women; they frequently described themselves as feeling fundamentally different. Women most commonly exhibited this experience of difference as a loss of confidence or self-esteem (Tod, 2008). Some women recalled struggling to recognise the person they were

before their MI due to the emotions they had experienced subsequently. Women experienced this process of change throughout their recovery as they began to integrate the experience of MI into their old-self and create a new- or changed-self. Many began to integrate the change to help them move towards new levels of personal growth as they engaged in behaviours that endorsed recovery (Olson, 2006).

Women acknowledged that their experience of recovery was enhanced when they received physical, emotional, and social support from family, neighbours, and friends. It was often important for women to know that they had someone to contact if they wanted to discuss their conditions or fears for the future. As one woman explained: *“my family was with me from the beginning! Completely. My husband and kids and mom and my brother and sister.... And it was very important for me, not only as an emotional and practical support, but they were one of the reasons why I am well-adjusted and still moving on”* (Petriček, Buljan, Prljević, & Vrcić-Keglević, 2017, p. 39). Many women also acknowledged the psychological toll their MIs had on their families and reflected experiencing feelings of overprotection, dependency and unmet expectations. Oppositely, some women described experiencing limited support. They too wanted to change their life situation following MI, but they did not have the support from their family or friends to do so. Changes in women's relationships with others were also evident post-MI (White et al., 2007). For women still active in the workforce, concerns related to negative perceptions from colleagues were apparent. Well-intentioned friends also restricted women's participation in previously enjoyed social roles, ultimately culminating in feelings of boredom and uselessness (Kerr, 1999). Meanwhile, many women experienced changes in their familial relationships which often resulted in a revision of roles.

Additional concerns presented by women related to alterations in their sexuality and sexual intimacy with their partner following MI (Sundler, Dahlberg, & Ekenstam, 2009).

Feelings of indifference about sex were common post-MI; for example, one woman explained “*I can take it or leave it. It’s not a big thing anymore*” (Abramsohn et al., 2013, p. 4). Themes of attribution to older age, medical problems, menopause, fatigue, and medication side-effects, were common. Following MI, women also reported new sexual concerns associated with the MI or other cardiac-related procedures: “*some positions you get in, you’re flat on your bed...different positions put pressure on your chest. So that was my main concern*” (Abramsohn et al., 2013, p. 5). Fear of engaging in sexual activity post-MI was also widespread. Women were fearful, and their partners were concerned that sex could be harmful. Many recalled that discussions with their physicians surrounding resuming sexual activity were vague.

Religiosity or spiritual support was noted as a protective factor for many women following MI. Engaging in religious or spiritual practices, such as praying, fasting and reciting religious quotes, helped individuals make sense of their health condition and realise their impending mortality (Vale, 1997). Women often acknowledged drawing strength from their faith in God, whom they believed controlled their lives; “*When the doctor told me that, I was not afraid from death because life and death are between our God’s hands*” (Ammouri, Kamanyire, Abu Raddaha, Achora & Obeidat, 2017, p. 341). Positively, drawing on faith alleviated anxiety and provided reassurance; enhancing their connection with God through repentance, prayers, and devotions were found to be essential components of the women’s religious experience.

Cardiac rehabilitation. The meta-synthesis of 8 studies pertaining to CR following MI contained six categories (Table 4), and provided the overall synthesised finding: “Cardiac rehabilitation facilitates understanding, promotes a return to function and fitness, offers support and belonging, and enables women to normalise their feelings following MI”.

Completers' recounts of CR were generally positive for a variety of reasons. Women consistently identified CR education as facilitating much of their understanding related to their MI; it was highlighted as being critical in helping them recognise the medical details concerning the diagnosis and the ongoing risk factors that led to them experiencing a cardiac event. Of the women who engaged in CR, many outlined their understanding of the need to make lifestyle changes. Having opportunities to discuss rehabilitation measures with healthcare professionals was central to validating the effectiveness of the lifestyle changes that some women had implemented and also enabled them to continue improving their health and recovery (Galdas & Kang, 2010).

Many women emphasised the promotion of pacing techniques in CR as another beneficial inclusion (Sherwood & Povey, 2011). This allowed women to recognise their current abilities in contrast to their past abilities and assisted in identifying small, measurable steps to allow them to gradually return to their optimal function and fitness. One woman noted: *"I've found – exactly as I've been told in Cardiac Rehabilitation, that you do things slowly you know, build up slowly – you get there"* (Sherwood & Povey, 2011, p. 271).

Some described CR as being of fundamental value in offering support through professional expertise, information provision, and belonging to a group. The notion of pacing often resulted in participants feeling more aware of their condition, feeling more confident in themselves and knowing how to reduce and assess future risk. Opportunities for receiving ongoing reassurance and support were beneficial to both women and their families. It was clear from many of the narratives that peer support and camaraderie was a critical element of the CR experience for women. There was also evidence of favourable comparisons of their position after, compared to before, CR. Moreover, many women positively evaluated having the opportunity to share their experiences with other group members. Many women made frequent references to feeling safe while engaging in CR; they identified CR as an

environment that fostered feelings of comfort and security. As one woman explained: *“it’s a very comforting feeling to me because there are cardiac nurses there, so if something is going to go wrong, they are there to help. I’m in a controlled environment and I feel very secure”* (McSweeney & Crane, 2001, p. 136).

The women described many ways in which they perceived benefit of CR in relation to their physical well-being. Many felt physically stronger, no longer *“like a cripple”* (Quigley, 2002, p. 96), and achieved a heightened sense of empowerment. Attending CR enabled them to reduce their fear and made them feel more assured about engaging in exercise following their MI. As one woman recounted: *“the exercise has done tremendous things for me. I feel like a whole new woman. When I started here, I felt like I entered a different world. I felt like I did when I was years younger. This has improved my life”* (Quigley, 2002, p. 95).

Of the women who chose not to attend or complete CR, the evaluations were varied. Negative perceptions of CR programs included unmet needs, predominantly concerning receiving less individual attention and having fewer opportunities to ask questions than initially anticipated. The presentation style and methods adopted by healthcare professionals were judged as undesirable by some women. Transportation was also frequently cited by women as being prohibitive and affected their ability to attend CR (Galdas & Kang, 2010). Several women who declined CR referred to independence. They displayed a dislike in seeking external help which appeared to result in a lack of perceived need for CR (Pullen, Povey, & Grogan, 2009).

Table 4

*Synthesised Findings and Component Categories of Women's Experiences of MI***Physical symptoms: Preconceived expectations, prior knowledge, unanticipated, misinterpreted symptoms, and reluctance to engage with healthcare professionals influence women's physical experiences of MI**

- Preconceived expectations of MI symptoms and own vulnerability to experiencing MI
- Undergoing an unfamiliar and strange development of discomfort and pain
- Experiencing, perceiving, and assessing symptoms before becoming concerned
- Struggling against intrusive symptoms to maintain control and responsibility
- Determining the optimal solution for symptoms
- Consulting a healthcare professional about symptoms or avoidance of engaging with health services
- Feeling vulnerable, living with an unreliable body, mistrusting the body and ongoing physical consequences of MI

Psychological outcomes and social impact: Facing new realities, living a different life, confronting mortality, and re-assessing priorities are pivotal to aiding women's psychological and physical recovery post-MI

- Facing new realities, experiencing a loss of freedom and living a different life that now features undesired loneliness, doubt and shame
- Heightened anguish, fear, denial, anxiety and depressive symptoms when confronting mortality
- The development of self-agency and coping with the consequences of their illness via either acceptance or avoidance
- Sexual confusion and strained sexual intimacy
- Engaging in religious practices and realising impending mortality
- Revision of life roles and re-assessment of priorities

Cardiac rehabilitation: Cardiac rehabilitation facilitates understanding, promotes a return to function and fitness, offers support and belonging, and enables women to normalise their feelings following MI

- Awareness of condition including understanding medical details concerning the diagnosis and risk factors, or causal beliefs, referring to factors which led to the cardiac event
- Identifying small, measurable steps to aid in each individual gradually returning to their optimal level of functioning and fitness
- Fundamental in offering support through information provision, professional expertise, and belonging to a group
- Ongoing interaction with peers and multi-disciplinary teams
- Enabled participants to share medical experiences, normalise their feelings and gain advice on coping
- Transport hindered ability to engage and attend

Note. CR = Cardiac Rehabilitation; MI = Myocardial Infarction.

Discussion

MI is a stressful life-threatening event that often involves physical, psychological/emotional, spiritual, and social sequelae. To the author's knowledge, this is the first meta-synthesis to explore the lived experience of women during and following MI. Findings from the included studies were aggregated into nineteen categories and three synthesised findings related to women's experiences of MI concerning their physical symptoms, psychological outcomes and engagement in CR (Table 4). Guidelines for healthcare professionals, such as psychologists, caring for women who have experienced psychological and social impacts of MI were derived (Table 5).

Physical symptoms. In the current study, women suffering MI experienced a complex assortment of prodromal and acute symptoms. The diversity of prodromal and acute symptoms described in the studies included in this meta-synthesis appear consistent with other published research; particularly regarding individuals experiencing sleep disturbances, tiredness/fatigue, indigestion, and shortness of breath (McSweeney et al., 2003; Miller, 2003). It has been speculated that the atypical symptom profile of women is influenced by physiological differences, the late onset of CHD, and evidence of co-morbidities (Then, Rankin, & Fofonoff, 2001).

In line with previous research, women also appeared to experience their own trajectory which involved the initial awareness of their symptoms, rationalising their symptoms, experiencing increased concern and seeking treatment (Brink, Karlson, & Hallberg, 2002; McSweeney, Lefler, & Crowder, 2005). It was discovered that many women delayed seeking medical assistance during their MI as they did not interpret their body changes as severe and threatening. The reasons for women's inappropriate reactions may be due to the vagueness, intermittent nature or varied location of their cardiac symptoms. Women also frequently endorsed expectations about the typical symptoms which they

perceived should accompany MI and, therefore, inaccurately estimated their risk of heart disease. Similarly, comparison to the experiences of friends and family appeared to significantly impact treatment-seeking behaviour in many of the studies included in this meta-synthesis. When women were able to recognise their symptoms as similar to those of others, they were more likely to identify the symptoms were due to MI and therefore would seek assistance immediately. It has been previously argued that the personal experience of heart disease through a close relative facilitates the development of a serious illness model in the sufferer and, consequently, reduces treatment delays (Lefler & Bondy, 2004; Petrie & Weinman, 1997). Previous research also suggests that women may be too embarrassed to report unspecific symptoms and consequently do not seek assistance from health professionals (Finnegan et al., 2000). Oppositely, those from disadvantaged socioeconomic groups often fear being censured for lifestyle behaviours which may heighten their risk of developing CVD (Richards, Reid, & Watt, 2002).

Psychological outcomes and social impact. Many of the psychological outcomes that emerged for women following MI resonate with previous literature exploring the illness experience. This includes living with loss and change, changes to one's confidence, overall adjustment, and feelings of disruption and chaos (Corbin, 2003; Tod, 2008). Common to all of the women in the current study was the experience of the grief process to assist with coping with the stress of loss after their MI. The women's grief process included experiencing bargaining, and feelings of denial, anger, guilt and fear. The process of experiencing grief to assist in coping with loss has been supported recurrently in the literature (Bergman & Berterö, 2001; Hentz, 2002). Bergman and Berterö (2001) explored the life situation, opportunities and obstacles encountered by individuals in making lifestyle changes following a diagnosis of coronary artery disease. Similar to the findings documented in many studies in this meta-synthesis, Bergman and Berterö's (2001) findings indicated that grief was

experienced in response to the loss of health status. They also noted that reorientation to the self and the change that consequently occurred was needed to ensure that individuals could create a new life for themselves.

Women's experience of MI was found in this meta-synthesis to be enhanced when they received support from those close to them. Many of the women explained the support they received from their family and friends initially was positive and helpful. As their health began to improve, they also recalled their need for support diminished; however, they often felt their family and friends were being overprotective. Oppositely, some women perceived that they were not offered enough support to meet their needs and consequently felt isolated and abandoned. Women also frequently reported that it felt foreign to accept assistance from others. As noted by Leifheit-Limson et al. (2010), support influences disease prognosis, reduces instances of depression, and provides individuals with encouragement and direct assistance when making lifestyle changes.

Not knowing how their MI would affect their everyday existence was initially also a significant source of anguish and insecurity for women. Other studies have described similar experiences for both men and women following MI (Bergman & Berterö, 2003; Jackson et al., 2000; Ostergaard Jensen, & Petersson, 2003). In the current meta-synthesis, numerous women found meaning in their MI experience and recalled experiencing positive outcomes such as having a second chance and being able to reconsider their priorities, life values and hopes for the future. Experiencing alterations in life values, such as prioritising their relationships with others and their health above work and household commitments, was consistent with findings documented in previous research (Bergman & Berterö, 2001; Jackson et al., 2000).

Engagement in psychological therapy has been found to improve long-term physical and mental health outcomes and decrease mortality rates following MI. Thus, care guidelines

relevant to specific aspects of the MI experience are also suggested (Table 5). Healthcare professionals, such as psychologists, should exhibit awareness of how women may present following their MI; they should attempt to normalise feelings of fear, depression, and anxiety while remaining empathic and supportive. It may be beneficial for psychologists to provide women with psychoeducation regarding adaptive coping strategies, sustaining behaviour change, increasing self-care, and adjusting to the changes in their interpersonal relationships. Likewise, psychological interventions should remain culturally and spiritually sensitive, and include other important individuals in the woman's life, if appropriate.

Table 5

*Guidelines for Healthcare Professionals Caring for Women Who Have Experienced Psychological and Social Impacts of MI***Psychological Outcomes**

- Ensure warm, genuine and supportive communication in all interactions
- Demonstrate awareness and respect for women's individual emotional states
- Acknowledge and normalise heightened feelings of anguish, fear, denial, anxiety and depression
- Remain constructive and offer frequent validation and positive feedback to enhance confidence
- Provide women with information on common reactions to MI
- Provide women with information on adaptive means of coping and self-care practices
- Women, and their families, should be given information and referrals for counselling/psychological intervention (if desired)

Social Impact

- Inclusion of, and support for, other family members (i.e. partners, children etc.) should be provided
- Treating healthcare professionals should assess the cultural, spiritual and religious needs of women who have experienced MI and integrate this into their care plan
- Psychosocial interventions should be culturally sensitive and consider the ethnic, functional and spiritual meaning of the change for women
- Acknowledge and normalise sexual confusion and strained sexual intimacy with one's partner following MI
- Acknowledge and normalise alterations in traditional role performance (i.e. women with domestic role expectations etc.)
- Collaborate with women who are unable to work due to their MI and formulate goals to assist them to return to work when they are physically able to do so (if applicable)

Training and Governance

- All cardiologists, nurses, and psychosocial clinicians should be trained in how to sensitively and respectfully respond to women who have experienced MI
- Hospital/CR settings should have multidisciplinary teams trained in best practice responses to MI
- Hospitals/CR programs should have established referral pathways for psychologists and social workers experienced in supporting those with cardiac conditions
- Hospitals/CR programs should have facilities purposely designed to meet the needs of women who have suffered MI. These facilities should be designed to support healthcare professionals in providing evidence-based care
- Healthcare professionals not trained in how to respond to the experience of MI should seek the professional supervision of skilled peers/mentors
- Employers should have policies in place to meet the psychosocial needs of their employees responding to either, their experience of MI, or their partner's experience of MI

Note. CR = Cardiac Rehabilitation; MI = Myocardial Infarction.

Cardiac rehabilitation. The findings of this meta-synthesis provide useful insights into the role that CR may play in the recovery of women who have suffered a MI. When attempting to regain their independence, women were required to reframe their lives to incorporate their MI experience. To do this, it was necessary for them to recognise the significance of their symptoms and establish why they suffered a MI. CR provided many women with plentiful information related to risk and causative factors which lead to the cardiac event.

Many women recalled the importance of positively seeking support following their MI and identified attending CR as an example of this. This finding is consistent with evidence that highlights the importance of the emotional support offered to participants in CR programs (Benz Scott, Ben-Or, & Allen, 2002). Likewise, the women in this study described many ways in which CR had positively benefited them since experiencing their MI. Examples of this included feeling like a new woman, feeling stronger, learning how to improve their lives, and not feeling apprehensive about engaging in exercise or experiencing a subsequent MI.

It was evident from the findings of this meta-synthesis that numerous women were not advised to attend, or referred to, a CR program. The literature identifies several barriers for women attending CR including issues with transportation, ongoing family and work commitments, struggling to understand how CR may be beneficial, and feeling isolated and estranged from the group (Feola et al., 2015; Galick et al., 2015; Scott, Lindsay, & Harden, 2003; Suaya et al., 2007). These barriers were also identified frequently in the current study. Of note, previous research (e.g., Pullen et al., 2009; Whitmarsh, Koutantji, & Sidell, 2003; Wyer, Earll, Joseph, & Harrison, 2001) has consistently revealed that CR non-attenders possess fewer positive perceptions of their condition and the extent to which it can be managed or treated.

Methodological Considerations

The methodological rigour of the results of qualitative meta-syntheses, in terms of consistency, reliability, and generalisability, is comparable to that found in systematic reviews of quantitative data. In this meta-synthesis, the key experiences, ongoing impacts, and coping strategies were found consistently across numerous studies suggesting that the findings are reliable and can be generalised to the majority of women who have suffered MI. It should be noted, however, that few studies employed open-ended interview formats and only a few relied on spontaneous responses from participants. It may be that women who have suffered MI have experienced additional impacts from the diagnosis and subsequent medical care, but a discussion of these did not spontaneously arise.

The search strategy used in this review did not include searching for unpublished works; however, as suggested by experts in the field of reviews and qualitative synthesis (including the Cochrane Qualitative Research Methods Group), exhaustive searches may not be appropriate for qualitative synthesis, with the key issues being data saturation and disconfirming cases (Dixon-Woods et al., 2006; Higgins & Green, 2011). Data saturation was achieved in this review with no new major themes emerging from the included studies that were analysed later in the process. Furthermore, no disconfirming cases were found to refute the themes found in the analyses.

The search strategy used in this review also imposed no limitations on the year of publication of the studies concerned. As a result, the included papers ranged in date from 1994-2018; a period of 24 years. During this period, much of the knowledge pertaining to CVD, and MI more specifically, advanced significantly. However, in this meta-synthesis no findings were identified which indicated that women's experiences of the physical, psychological and social impacts of MI were different between the studies published in different eras.

Implications for Clinical Practice

The results from this meta-synthesis contribute knowledge regarding the lived experience of MI for women. It was frequently cited that women delayed seeking medical assistance during MI due to misinterpreting the severity of their symptoms. Reducing treatment-seeking delay is critical as time is a crucial factor in minimising permanent damage to the heart and preventing death due to MI (Herning, Hansen, Bygbjerg, & Lindhardt, 2011; Madsen & Birkelund, 2016). Help-seeking delay at the onset of prodromal MI symptoms is a known phenomenon in the arena of cardiac research and while the issue has been explored from many perspectives, the results are diverse and often highlight significant gender differences in help-seeking delay during MI (De Luca, Suryapranata, Ottervanger, & Antman, 2004; O'donnell, Condell, Begley, & Fitzgerald, 2006; Ottesen, Dixen, Torp-Pedersen, & Køber, 2004; Ting et al., 2008). Assessing society's knowledge of prodromal and acute MI symptoms is paramount when designing interventions that aim to decrease time to treatment engagement (Ammouri et al., 2017).

This meta-synthesis is also relevant to professionals working within preventative and rehabilitative cardiac care. The findings of this study may provide useful and timely guidance for professionals as they attempt to understand women's experiences during and following MI, optimise their ability to monitor their cardiac health and increase women's engagement with CR programs and related services (Table 5). Likewise, this study's findings also highlight potential barriers to engagement in CR programs that should be taken into consideration.

Conclusion

Three synthesised findings were identified from 63 studies in this meta-synthesis. The extracted themes were based on women's experiences during and following MI and revealed that women's experiences vary considerably. While some women had difficulty identifying

the symptoms of their MI, many recalled experiencing life-threatening symptoms and fearing they would die. Many women conveyed their need to make lifestyle modifications following their MI and identified that they were given another chance at life. Almost all women highly valued the physical, psychological and social support that their respective support systems were able to offer. Engaging in religious or spiritual practices influenced many women's interpretations of their illness. Moreover, concerns regarding resultant physical changes were expressed.

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* Denotes studies included in this meta-synthesis

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Appendix A

Complete Logic Grids for Electronic Databases

CINAHL

Myocardial Infarction	Women	Qualitative
MH "myocardial infarction" OR MH "myocardial diseases" OR MH "heart arrest" OR TI "myocardial infarct*" OR AB "myocardial infarct*" OR TI "heart attack*" OR AB "heart attack*" OR TI heart arrest*" OR AB "heart arrest*" OR TI "cardiac arrest*" OR AB "cardiac arrest*" OR TI "acute coronary syndrome*" OR AB "acute coronary syndrome*" OR TI "heart rehabilitation" OR AB "heart rehabilitation" OR TI "cardiac rehabilitation" OR AB "cardiac rehabilitation"	MH women OR MH female OR TI woman* OR AB woman* OR TI women* OR AB women* OR TI female* OR AB female*	MH "qualitative studies" OR TI qualitative* OR AB qualitative* OR MH "focus groups" OR TI "focus group*" AB "focus group*" OR MH interviews OR TI interview* OR AB interview* OR MH "thematic analys*" OR TI "thematic analys*" OR AB "thematic analys*" OR MH "content analys*" OR TI "content analys*" OR MH "discourse analys*" OR TI "discourse analys*" OR AB "discourse analys*" OR MH "life experiences" OR TI "lived experience*" OR AB "lived experience*" OR TI "interpretative phenomenolog*" OR AB "interpretative phenomenolog*" OR TI ethnograph* OR AB ethnograph* OR TI "case stud*" OR AB "case stud*" OR TI narrative* OR AB narrative*

Embase

Myocardial Infarction	Women	Qualitative
"heart infarction"/de OR "acute heart infarction"/de OR "heart rehabilitation"/de OR "heart infarct*":ti,ab OR "acute heart infarct*":ti,ab OR "heart rehabilitation":ti,ab OR "myocardial infarct*":ti,ab OR "heart attack*":ti,ab OR "acute coronary syndrome*":ti,ab	female/de OR female*:ti,ab OR woman*:ti,ab OR women*ti,ab	qualitative/de OR qualitative*:ti,ab OR focus group*:ti,ab OR interview/de OR interview*:ti,ab OR "thematic analys*"/de OR "thematic analys*":ti,ab OR "content analys*"/de OR "content analys*":ti,ab OR "discourse analys*"/de OR "discourse analys*":ti,ab OR "personal experience"/de OR "lived experience*":ti,ab OR "interpretative phenomenolog*":ti,ab OR ethnograph*:ti,ab OR "case stud*":ti,ab OR narrative*:ti,ab

ProQuest Global Theses

Myocardial Infarction	Women	Qualitative
NOFT("myocardial infarct*" OR "heart attack*" OR "acute coronary syndrome*" OR "cardiac arrest" OR "heart arrest" OR "cardiac rehabilitation" OR "heart rehabilitation")	NOFT(women* OR woman* OR female*)	NOFT(qualitative* OR "focus group*" OR interview* OR "thematic analys*" OR "content analys*" OR "discourse analys*" OR "lived experience*" OR "interpretative phenomenolog*" OR ethnograph* OR "case stud*" OR narrative*)

PsycINFO

Myocardial Infarction	Women	Qualitative
myocardial infarctions.sh OR cardiac arrest.sh OR myocardial infarct*.ti,ab OR heart attack*.ti,ab OR acute coronary syndrome*.ti,ab OR cardiac arrest*.ti,ab OR heart arrest*.ti,ab OR cardiac rehabilitation.ti,ab OR heart rehabilitation.ti,ab	human females.sh OR women*.ti,ab OR woman*.ti,ab OR female*.ti,ab	qualitative*.ti,ab OR focus group*.ti,ab OR interview*.ti,ab OR thematic analys*.ti,ab OR content analys*.ti,ab OR discourse analys*.ti,ab OR lived experience*.ti,ab OR interpretative phenomenolog*.ti,ab OR ethnograph*.ti,ab OR case stud*.ti,ab OR narrative*.ti,ab

PubMed

Myocardial Infarction	Women	Qualitative
"myocardial infarction"[mh] OR myocardial infarct*[tiab] OR cardiac arrest*[tiab] OR heart attack*[tiab] OR heart arrest*[tiab] OR acute coronary syndrome*[tiab] OR heart rehabilitation[tiab] OR cardiac rehabilitation[tiab]	"women"[mh] OR "female"[mh] OR women*[tiab] OR woman*[tiab] OR female*[tiab]	qualitative*[tiab] OR focus group*[tiab] OR interview*[tiab] OR thematic analys*[tiab] OR content analys*[tiab] OR discourse analys*[tiab] OR lived experience*[tiab] OR interpretative phenomenolog*[tiab] OR ethnograph*[tiab] OR case stud*[tiab] OR narrative*[tiab]

Scopus

Myocardial Infarction	Women	Qualitative
TITLE-ABS-KEY("myocardial infarct*" OR "heart attack*" OR "acute coronary syndrome*" OR "cardiac arrest" OR "heart arrest" OR "cardiac rehabilitation" OR "heart rehabilitation")	TITLE-ABS-KEY(women* OR woman* OR female*)	TITLE-ABS-KEY(qualitative* OR "focus group*" OR interview* OR "thematic analys*" OR "content analys*" OR "discourse analys*" OR "lived experience*" OR "interpretative phenomenolog*" OR ethnograph* OR "case stud*" OR narrative*)

Sociological Abstracts

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Web of Science

Myocardial Infarction	Women	Qualitative
TS=("myocardial infarct*" OR "heart attack*" OR "acute coronary syndrome*" OR "cardiac arrest" OR "heart arrest" OR "cardiac rehabilitation" OR "heart rehabilitation")	TS=(women* OR woman* OR female*)	TS=(qualitative* OR "focus group*" OR interview* OR "thematic analys*" OR "content analys*" OR "discourse analys*" OR "lived experience*" OR "interpretative phenomenolog*" OR ethnograph* OR "case stud*" OR narrative*)

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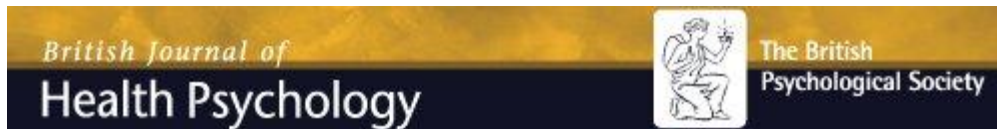
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