

Factors affecting women's well-being during the experience of acute myocardial infarction: a literature review

Chiara Foà¹, Giulia Fuochi², Laura Fruggeri³

¹ University Teaching Hospital, Parma, Italy; ² Collegio Carlo Alberto, Turin University, Italy; ³ Department of Literature, Arts, History and Society, Parma University, Italy

Abstract. *Background and aim of the work.* Many factors influence the experience of acute myocardial infarction (AMI) and the well-being of affected patients; gender differences emerge in the patterns of influence, and women's specificity is frequently highlighted. The purpose of this literature review is exploring in depth the experience of AMI in women. *Methods.* We selected and analyzed 44 articles on five factors strongly affecting women's well-being after AMI: the delay in seeking treatment for symptoms, medical treatment, therapeutic adherence, social support and coping strategies. *Results.* The studies have attributed gender differences in the delay in seeking care for symptoms partly to a lack of information, but especially to socially built factors, such as the stereotypic belief of cardiac diseases as "male diseases". Studies on the medical treatment show that women are less likely to undergo diagnostic tests and clinical treatment compared to men, but women's older age may counterbalance the gender effect. Compared to men, therapeutic adherence appears lower in women, who find lifestyle changes more difficult to achieve; however, women rely more on social support, affecting positively their well-being. Also, women use more emotion-focused, evasive or fatalistic coping strategies; they are likely to minimize the severity of symptoms, to try to control the disease and to protect the significant others from the negative consequences of the infarction. *Conclusions.* Most studies highlight gender differences in the experience of AMI and in the patterns of influence of the factors we analyzed.

Key words: acute myocardial infarction, women, well-being, delay, treatment, adherence, compliance, social support, coping

Introduction

The epidemiological literature available on acute myocardial infarction (AMI) is quite extended and varied, and knowledge about this topic is spreading steadily. Many factors strongly influence the experience of AMI and the well-being of affected patients. Some of these factors emerge quite frequently from the previous studies: not only the delay in seeking treatment for symptoms (1) and in receiving the medical treatment (2), but also: the therapeutic adherence (3), intended as an active, voluntary and collaborative participation to the achievement of a therapeutic re-

sult (4); coping strategies (5), intended as the efforts to handle external and internal demands generated from stressful events (6); and social support (7), intended as an individual's perception of how sources of support (family, friends and significant other) can act as a buffer between stressful events and symptoms (8).

As the recent literature shows, gender can influence the impact of the listed factors on the experience of AMI; nonetheless, women affected by AMI have been for a long time disregarded by research (9,10) and AMI was traditionally considered a "male disease". By consequence, scarce attention was put on women's risk factors (11), women's symptoms tended to be described

as “atypical” (12) and the medical treatment has been shaped, for a long time, on a male model of cardiac disease (13); women have also been found to receive less pharmacological treatment compared to men, a fact not explicable by other factors like diabetes, age, symptoms or pre-hospital delay (14). This had implications on women’s well-being; in fact, if compared to men who have experienced AMI as well, quality of life was significantly lower among post-AMI female patients despite similar age, treatment, and clinical data of men (15).

Since then, substantial progress has been made in this kind of research; still, despite the recent literature considers the female population affected by AMI, most studies treat gender as a socio-demographic variable, for descriptive purposes; only few studies draw gender-specific conclusions, comparing men and women as two different samples, and considering gender as an explanatory variable of the differences observed in AMI patients, at various stages of the disease.

The purpose

Given these premises, the purpose of this literature review is exploring in depth the experience of AMI in women, focusing on women’s well being during the different phases of the disease. We analyze the previously listed factors, affecting the well-being of AMI patients: at the onset of the event, the delay in seeking treatment for symptoms, and after the infarction, the medical treatment, therapeutic adherence, coping strategies and social support.

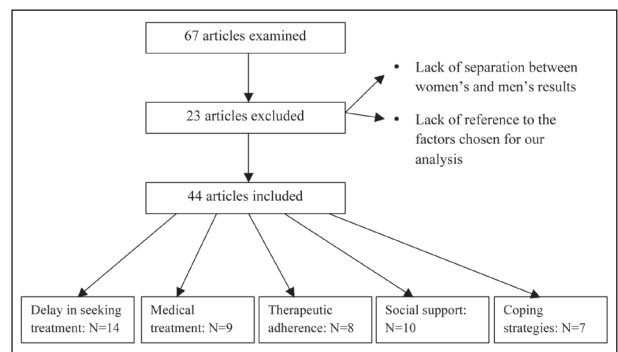
We suppose that the more knowledge on the distinctiveness of women’s experience of AMI is produced and diffused, the more health professionals will be able to offer personalized care and proper assistance.

Method

To pursue the above purpose, we selected articles on the basis of the following inclusion criteria: the subject had to be among the factors we chose for our analysis; the analysis had to emphasize sex differences or to be focused on women; the articles had to

be published on international peer-reviewed journal in the last 20 years (1994–2014); the language had to be English. The exclusion criteria were the following: the lack of separation between men’s and women’s results, thus the lack of gender as an explanatory variable, and the strict consideration of biomedical variables or pharmacological issues, without reference to our chosen factors.

In our selected databases (CINAHL, MEDLINE, PsycINFO, Psychology and behavioral Sciences Collection, PubMed), we inserted the following keywords: “myocardial infarction”, “women”, “gender differences”, “sex differences”, and keywords for our chosen factors, separately and in various combinations: “delay in seeking care”, “delay in seeking treatment”, “delay symptoms”, “medical treatment”, “medical care”, “therapeutic adherence”, “compliance”, “concordance”, “self-care”, “coping” and “social support”. The research gave us 67 articles, but we excluded 23 articles from this set, following the exclusion criteria we established. We thus analyzed 44 articles, among which 3 could be mentioned both for social support and coping strategies, and one could be mentioned both for therapeutic adherence and social support, for a total of 48 themes (N=48). The flow chart below illustrates the topics addressed in the articles selected for this literature review.



Results

Delay in seeking treatment for symptoms

This is the most investigated topic (N=14 articles) among the factors we chose for our analysis; one possible explanation is the recognition of the delay in seeking treatment for symptoms as a potential cause of higher mortality rate and increased risk of morbidity for post-AMI patients (16). Rosenfeld in 2001 (17)

highlighted that although it was acknowledged that women delayed longer than men before seeking help for symptoms of AMI, still few studies were able to compare the different factors affecting the decision of delay, across genders.

From this study, some progress has been made, although in some cases gender continued to emerge as a secondary factor affecting the delay. For instance, Zerwic et al. (18) found that women did not delay significantly longer than men, while African American delayed significantly longer than non-Hispanic White patients.

However, many studies have recognized that different factors can determine the delay in seeking treatment for AMI symptoms in women and men. For example, Løvlien, Schei and Hole (19,20) analyzed in two studies the questionnaires reporting information on the year prior to first-time myocardial infarction completed by 149 women and 384 men; they found that low education and low partner education predicted prolonged delay in seeking care for symptoms men, but not in women (19); moreover, they found that the experience and interpretation of symptoms had more influence in men than in women (20).

In general, in more recent years the literature on AMI has started to show a tendency towards a more careful understanding of the major reasons that lead women with AMI symptoms to delay the use of medical care. Two main hypotheses can be developed on the reason for this delay: first, the lack of information on AMI symptoms and on the possibility that cardiac diseases affect women as well as men, and with slightly different patterns; second, the desire to control the situation and the fear of recognizing the symptoms of a heart-related illness. This latter one is supported by the work of Dempsey, Dracup and Moser (21), who analyzed sixteen women between the ages of 42 and 82 years hospitalized in a coronary care unit after AMI, reporting a median delay time in seeking treatment after the start of symptoms equal to 5.4 hours, with a range of hours of delay extending from 1.5 to 144 hours. The authors ascribed the delay to the desire of the women interviewed to maintain control over themselves and their environment, with the result of ignoring the symptoms and resort to self-treatment, until the same symptoms were perceived as threaten-

ing. The minimization of symptoms was found also by Rosenfeld (16) in a study involving 52 women hospitalized for acute myocardial infarction, reporting a median time of delay in seeking treatment for AMI symptoms of 4.25 hours. The author described two main decision trajectories used by women when experiencing symptoms of acute myocardial infarction: knowing that they had to seek help (found in 25 of the participating 52 women) and managing alternative explanations for their symptoms, minimizing them (found in 23 women). Semi-structured interviews detected the use of these strategies, while standardized instruments allowed to find that lack of social support, personal control, heart disease threat, and neuroticism are predictors of the delay. This research has been extended through another article, relying on the same sample, published in the following year (22): it identified six common patterns of behavior during the decision time: knowing and going, knowing and letting someone take over, knowing and going on the patient's own terms, knowing and waiting, managing an alternative hypothesis, and minimizing. These patterns were then grouped in the two decision trajectories described in the previous work by Rosenfeld (16): knowing or managing.

Other studies attributed the cause of women's delay in seeking treatment for AMI symptoms more to the first hypothesis, grounded on lack of information and on the wrong belief of not being at risk of heart attack as men are. While synthesizing the nursing literature on women's delay in the treatment of symptoms, Lefler (23) identified the reasons for this delay in severity and specificity of the symptoms, atypical presentation of symptoms, differences in event perception according to gender roles, the interpretation and the attribution of symptoms. Lefler and Bondy (24) produced a meta-synthesis indicating that women, especially the oldest ones, delay their access to medical care for various reasons, in particular related to the misinterpretation of cardiac symptoms, symptoms that can be attributed to other diseases. The same reasons for the delay already described by Lefler (23) were resumed, additionally to the presence of other chronic illnesses able to confuse AMI symptoms, beliefs of self-perceived low vulnerability to heart attack, and engagement in various other coping mechanisms. The hypothesis on the lack of in-

formation on symptoms was supported also by Martin et al. (25), who found that in a sample of 157 male and female AMI patients comparable on age, cardiac risk status, medical history, symptom presentation and other features, women were less likely to recognize AMI symptoms as cardiac symptoms.

Both the hypotheses on the causes of the delay in seeking treatment were supported by a study of Moser et al. (26), who interviewed 194 AMI patients to identify sociodemographic, clinical, social, behavioral, cognitive and emotional factors contributing to the delay. The authors did not find significant differences between men's and women's delay, but they found gender differences in the reasons for the delay, especially on the dimensions of age, history of AMI, type of AMI (Q-wave and non-Q-wave), concerns about not wanting to trouble others, and prior knowledge of thrombolytics.

Reconciling the many underlying causes of women's delay in seeking help for AMI symptoms, two qualitative studies described female patients' conditions during the event. First, Higginson (27) conducted a study relying on grounded theory research approach on (25) post-MI female patients: the author found that women delayed for many different reasons, that could be grouped into the following categories: lack of recognition of symptoms, a preference for self-medication and the perception of MI as a "male" disease. Second, Arslanian-Engoren (28), while analyzing the oral descriptions of ten women hospitalized for a MI, found women's treatment seeking decisions influenced by the following issues: attribution of the atypical symptoms to non-cardiac causes, minimization of symptoms, mass media portrayal, male family member experience, knowledge deficit, unreal expectations, family insistence, and the type of pain due to the symptoms themselves.

The so far reviewed literature on the delay in seeking medical care for symptoms identified mainly "individual causes", but several studies highlighted how the responsibility of the delay did not belong only to the individual. In particular, Schoenberg et al. (29), while conducting in-depth interviews with 40 middle-aged and older women at risk for MI and in general for coronary heart disease (CHD), found that besides the lack of information on the symptoms, the delay can

be affected by social and structural constraints. Such constraints are the social construction of a norm on cardiac symptoms as "male symptoms", the inadequacy of the interaction with the health care professionals, the competing social demands women face when threatened by a serious illness, and structural barriers delimiting women's health care choices.

Medical treatment

As already mentioned in the Introduction, it is common evidence that infarcted women in general receive less medical treatment than men; we found noticeable interest also for this topic (N=9 articles).

The main issue addressed in the reviewed studies was the reason for the diversity between the treatments usually received by women and those received by men. The main explanations for such diversity in the literature were fairly divergent from each other. Focusing on the fact that women are affected by heart attack later in life than men, some studies have attributed the diversity of treatments to age. Other studies have shown that belonging to the female gender is in itself a major explanatory factor for these differences.

One of the studies proposing the explanation of age is by Williams, Fraser and West (30): relying on a wide sample of post-AMI patients of both sexes, the authors showed that although women underwent a minor amount of clinical exams and received less medical treatment than men, those differences were attributable to age, more advanced among women (average age of 75 years) than among men (average age of 66 years). Along the same line, Gevigney et al. (31) compared men and women after AMI: they found that during the first three months after the event women were subjected to diagnostic procedures less frequently than men, even though they were on average older than men in the sample (average age of 76 vs. average age of 64). Nonetheless, the authors concluded that age, not gender, was the crucial predictor of patients survival. In view of these results the authors wondered if mortality would have been lower among women in case the diagnosis and therapies had been similar for both sexes.

A reference focusing on gender as the reason for the difference in medical treatment is instead the study of Clarke et al. (32), also conducted on a large sample of patients with AMI. The results of this study showed

that although the female members of the sample were on average older than the male members of the sample, and that the probability of admission to cardiac care was decreasing as age increased for both sexes, older women still had a lower chance of being admitted to the coronary unit than men of similar age. So, men and women at later age did not receive the same treatment.

Also Garavalia et al. (2), relying on a sample of 676 women and 1420 men after AMI, showed that women received fewer treatments (eg. anti-anginal medications, beta-blockers and calcium channel inhibitors) compared to men; this happened despite the fact that women were older and that one month after AMI they reported worse physical health and more severe symptoms, if compared to men. Accordingly, Wilkinson et al. (33) showed, by means of an observational follow-up study, that women were less treated with thrombolysis and had substantially less probability of being discharged taking beta-blockers compared to men, despite women's older age, thus confirming the previous findings (2). The authors also found that women had less probability of survival in the 30 days immediately following the acute myocardial infarction, and this excess risk persisted even when adjusting for age, severity of infarction and other variables.

The evidence of lower medical care provided to AMI female patients, compared to male patients, is found also for cardiac rehabilitation programs (34), frequently not adapted to women's needs, as the presence of emotional support (35). Gender seemed a discriminating factor also for the probability of post-AMI surgery. For example, Nante et al. (36) found that for myocardial infarction, but also for other coronary artery diseases like chronic ischaemia, chest pain and angina, male patients had more probability of being subjected to revascularization interventions, even when adjusting for age and other risk factors.

As a conclusion, we mention the study by Vaccarino et al. (37), explaining the higher probability of death two years after the AMI detected for women, compared to men. The authors, after having analyzed data on 384,878 patients (155,565 women and 229,313 men) from 30 to 89 years of age, pointed out how this higher risk could be found in younger women (less than 75 years), not in the older ones, suggesting that gender was likely to be a risk factor in the process.

Among the possible explanations for the higher risk of death among younger women, the authors mentioned the lower rate of use of established treatments for myocardial infarction, such as aspirin, beta-blockers, and thrombolytic therapy.

Therapeutic adherence

Even for therapeutic adherence and self-care (N=8 articles), gender differences might still be driving the specificity of women's well-being after AMI: for example, the requested change in lifestyle following the infarction might be more problematic for women. Radley et al. (38), when comparing the quantity and variety of problems encountered by 60 women and 60 men affected by AMI during the month after hospital discharge, found that changes in lifestyle, together with current medical conditions, were the most mentioned problems by women; on the contrary, men mostly mentioned work-related issues and financial problems. A following statistical testing ascertained how the problem of lifestyle changes was significantly correlated to gender and social class.

Kirchmayer et al. (39) studied the therapeutic adherence of 3920 AMI patients aged between 35 and 80 years old, in the year following hospital discharge; women, who represented the 26.8% of the sample, showed lower therapeutic adherence than men for any type of drug, most notably for the intake of statins. Concerning poly-therapy, the authors found lower probability of adherence for women in univariate analysis, an evidence that persisted even when adjusting for the background variables of the patients, in the multivariate analysis.

Another study (40) showed that age, jointly with gender, could be a determinant of post-AMI recovery: younger women, aged between 30 and 55 years old, proved more able to change wrong life habits (like smoke, unbalanced nutrition, scarce physical activity, high stress) and to decrease the responsibility towards others. Despite younger women's increase in the ability to ask for help and to express their thoughts, feelings and needs, they still reported some difficulty in taking care of themselves, and avoid taking care of others.

Gender differences in therapeutic adherence were highlighted in a study by Martin et al. (41) on a group of 157 post-AMI patients, 109 men and 48 women of

similar age. The authors found that after hospital discharge, women were less likely to attribute their heart attacks to modifiable behaviors such as diet, exercise, smoking habits, and more likely to attribute them to pathophysiological unchangeable factors (such as heredity, concomitant diseases and history of cardiac disorders). These attributions were negatively correlated to behavioral changes in lifestyle habits and to the reduction of improper behavior. Gender differences were present also in the retrospective cohort study by Lauffenburger et al. (42) on AMI patients older than 64: the authors found lower therapeutic adherence for women compared to men, regarding in particular the intake of angiotensin-converting enzyme inhibitors/angiotensin receptors blockers and beta-blockers.

A special case is represented by adherence to cardiac rehabilitation: Thow et al. (43), by means of three large cardiac rehabilitation programs implemented in the west of Scotland, showed that many post-MI female patients did not accept cardiac rehabilitation, after the referral. The authors suggested that to increase adherence, the cardiac rehabilitation programs, their structure and recruitment strategy had to address women's specific issues.

Concluding, gender differences seem quite evident when observing therapeutic adherence and self-care behaviors after AMI; nevertheless, these differences may be counterbalanced by the effect of age. Setoguchi et al. (44) found that in a representative sample of 1,625 low-income American patients affected by MI and aged more than 65, where the women represented the 80% of the total sample, the use of recommended cardiovascular drugs (statins, blockers, and ACE inhibitors or ARBs) after discharge did not differ by gender. The combined effect of gender and age for therapeutic adherence after a cardiac event, including AMI as well, was found also by Dolansky et al. (45). The authors compared exercise adherence, measured as three exercise sessions per week, between men and women at different ages: exercise adherence proved constant across different age groups for women, whereas it was found higher in younger men compared to older men (aged between 70 and 86).

Social support

Concerning social support (N=10 articles), studies comparing male and female post-AMI patients are

not so widespread; on the other hand, results focused on women can be found. Bowers e Buchanan (40) collected reflections and dialogues of six women affected by MI, and aged from 30 and 55 years, through guided autobiographical group intervention; the authors showed how social support, including need for companionship, emotional reassurance and understanding, was extremely important for the well-being after MI, in particular to compensate women's increased physical and emotional vulnerability. While social support from family and friends was reported as generally satisfactory, the participants reported a lack of attention and support from health professionals.

Similar results were obtained from the qualitative study by Sjöström-Strand and Fridlund (46) that relying on phenomenographic approach, focused on 14 post-AMI female patients. Following hospital discharge, the social support received from family members significantly reduced work and family stress; at the same time, a lack of social support by the medical staff was noticed. The results suggested the need to implement individualized treatment plans and self-help groups to express common concerns and promote the exchange of information. The importance of social support from family and friendship networks was highlighted also by the correlational, descriptive study by Kamm-Steigelman et al. (47), conducted with 59 women aged from 35 to 64, who had experienced AMI; such support, together with religious faith, was positively correlated with a decrease in depressive symptoms, greater satisfaction with their lives and greater psychological well-being. Also Murphy et al. (48) found an association between lack of social support in women after an acute cardiac event (in this case, AMI or coronary artery bypass graft surgery) and self-reported anxiety and depression in the year following the cardiac event.

Social support in women who experienced AMI was found correlated even to the progression of the disease itself. Wang et al. (49) showed that in a sample of 292 women, aged from 30 to 65 years, and hospitalized with AMI or unstable angina, the lack of social support increased the progression of coronary atherosclerosis. The progression of coronary atherosclerosis was measured as the change in mean luminal diameter from first to second measurements of 10 pre-defined coronary segments, and it was evaluated three-six

months after hospitalization and three years later. The authors found that even when controlling for age, smoking history, body mass index, menopausal status, and AMI diagnosis, significantly greater coronary atherosclerosis progression was present among socially isolated women and among those who lacked emotional support. High perceived social support was associated to a lower rate of atherosclerosis progression, in particular if women reported adequate interpersonal social relations and strong emotional support.

Regarding the differences between male and female post-AMI patients, five studies can be mentioned. The earliest is by Riegel and Gocka (50): the authors measured self-esteem, emotional distress, perceived health status, interpersonal dependence and social support among 32 men and 32 women, one and four months after hospital discharge. The results showed that women and men adapted themselves to the consequences of infarction in different ways and along different trajectories. Social support appeared to be the factor that contributed more to the adaptation of the women, while this was not for men. Moreover, men and women experienced similar levels of adaptation four months after the attack, although the trajectory differed in the two cases.

Kristofferzon, Lofmark and Carlsson produced a literature review (51) and two studies (52,53) on coping strategies and social support of women and men after MI. The literature review shed light on gender differences in social support received after MI: men appeared more likely to involve their spouses in their recovery, and reported more support from their spouses, compared to women. Women reported less social support up to one year after the event, compared to men, and less help with household tasks from informal caregivers. Also, women received less information about the disease and rehabilitation, and they perceived lack of belief in their heart problems from caregivers.

The two studies by the same authors relied on a sample of 74 women and 97 men, at the time of MI; the overall results showed that one month after MI, women reported lower physical and psychological quality of life than men. But one, four and twelve months after MI, women perceived social support from friends, grandchildren and the staff of the church; differently, men perceived more support from their

partner. These findings confirmed to some extent the evidence summarized in the previous literature review of the authors (51).

Although the patterns of social support may show gender differences, the general levels of social support may not highlight the same differences, especially for younger ages. Bucholz et al. (54), in an observational study in USA and Spain, categorized 3432 patients aged less than 56 years as having low or moderate to high perceived social support using the ENRICH Social Support Inventory; low social support was encountered in the 21.2% of the cases. The authors found that men and women had similar levels of social support at baseline; on average, patients with low social support reported lower functional status and quality of life and more depressive symptoms at baseline and 12 months after AMI. When adjusting for individual specificities, low social support was associated with lower mental functioning, lower quality of life, and more depressive symptoms at 12 months, not with worse physical functioning. Also, the authors did not find interactions between social support, sex, or country.

Coping strategies

Coping strategies are a very delicate issue for people affected by myocardial infarction. A patient's coping style with stressful situations already influences the delay in seeking treatment for AMI symptoms; as recalled in section 4.1, the minimization of symptoms and the lack of acknowledgement of the possibility of a cardiac disease postpone the search for medical care at the onset of symptoms. The studies we selected on coping strategies of people who experienced AMI focus in part on gender differences and in part on women (N=7 articles).

Bogg, Thornton and Bundred (55), relying on a sample of 169 male and 51 female AMI patients of similar age, analyzed coping strategies six months after the infarction according to the Coping Inventory for Stressful Situations (56). The results highlighted significant gender differences: women relied more on coping strategies than men and were more likely to face the stressful event through emotion-focused coping strategies. Despite this, women experienced greater emotional difficulties and reported lower quality of life compared to men.

Along the same line, a study by Panthee et al. (57) showed that men on average used more problem-focused coping strategies than women, and that myocardial infarction patients who relied more on problem-focused coping strategies reported better quality of life than patients relying less on them.

The three studies by Kristofferzon, Lofmark and Carlsson (51-53) mentioned before for social support provided results also on gender differences in coping strategies of AMI patients. The literature review (51) reported that women used a variety of coping strategies, more intensively than men. Moreover, female patients were more likely to minimize the impact of the disease, to postpone the search for treatment and to avoid telling their health problems to others.

The other two studies by the same authors (52, 53) analyzing coping strategies through the Jalowiec Coping Scale (58) on a sample of 74 women and 97 men, confirmed the importance of gender differences at various stages after the infarction. One month after the event, women used more evasive and supportive coping and experienced a lower quality of life than men: women reported difficulties in handling the psychological consequences of the heart disease. The authors did not find statistically significant changes over time in most coping strategies for both sexes, except fatalistic coping, whose use decreased over time in men. Four and twelve months after the infarction, female patients relied on evasive coping more than male patients. Nevertheless, the most used coping strategies by both sexes during the year following the infarction were guided by optimism, self-reliance and a push to face events; the latter one showed positive consequences on the patients' well-being in the long term.

A study linking coping strategies to gender differences in patients' well-being after AMI was the one by Brink, Karlson and Alberg (59), focusing on 37 women (average age of 72) and 77 men (average age of 65) in the first five months after myocardial infarction. Although the infarction had negative consequences on the mental and physical well-being of all the patients, women proved to have a significantly lower physical quality of life than men. Moreover, while coping strategies grounded on fatalism negatively influenced the patients' health-related quality of life, minimization had the opposite impact.

If gender differences in coping strategies play a part in gender differences in the well-being of AMI patients, women will be likely to follow a specific path towards adjustment after the infarction event. This was proved by White, Hunter and Holttum (60), who conducted a qualitative study on 5 women after their first MI, analyzing the collected data by means of Interpretative Phenomenological Analysis. In this study, adjustment was conceived as the perceptions women had of their own cardiac event, the impact of the infarction on women's relationships with others and coping strategies they used to face the event. The results showed that women played down the severity of symptoms and the impact of infarction, expressing optimism and the hope that normality would have come back in their lives; this coping strategy could be linked to avoidance and minimization of the event, but also, as the authors stated, as a way of protecting others. The latter finding is a sort of repetition of what was already found for women's delay in seeking treatment for symptoms and women's search for social support: very often these patients do not want to bother others for their health problems, and this has implications on their physical and mental well-being during and after the experience of acute myocardial infarction.

Conclusions

The studies we summarized in this review report gender differences in the acknowledgement of AMI symptoms, in the pathway through medical care and recovery from AMI, and in the psychosocial adjustment characterizing patients' life after the infarction.

Regarding the onset of symptoms, the studies on the issue of delay in seeking care for symptoms and in the access to health care have attributed gender differences partly to a lack of information, but especially to socially built factors. Among these factors, stereotypical beliefs of cardiac diseases as "male diseases" (not completely justified by the different levels of incidence of the disease in the two sexes) help reinforcing the perception of women's symptoms as atypical. This kind of stereotypical beliefs modifies the patients' and health professionals' attitudes and behaviors towards acute

myocardial infarction. As a consequence, women are less able to recognize AMI symptoms and to attribute them to a cardiac disease; moreover, they do not understand the importance of a timely access to medical care, underrating the threat for the health and delaying the search for treatment.

For what concerns the stage of medical treatment after AMI, the research indicates how women have a lower probability to undergo diagnostic tests and clinical treatment compared to men, even though women's older age may play a role in explaining this difference.

Gender differences in the experience of myocardial infarction emerge also in the psychosocial adjustment after the cardiac event. While men appear more worried about the repercussions the disease may have on their job and their financial situation, women face more difficulties with the required lifestyle changes and the physical consequences of the infarction. In fact women show lower quality of life than men, especially on the physical dimension of quality of life; fragility has also been observed in women's general health; moreover, women are more likely to experience anxiety and depression symptoms.

Concerning therapeutic adherence and self-care behaviors, female AMI patients feel less responsible for their lifestyle changes, compared to their male counterparts; this results in lower adherence, even if the effect of gender may be counterbalanced by the effect of age.

In the end, several studies show that quality of life after AMI is linked to coping strategies and perceived social support. Women affected by AMI try to keep control over the disease, to minimize the severity of symptoms, and to protect the significant others from the negative consequences of the infarction. Consistently with this, AMI female patients use more emotion-focused, evasive or fatalistic coping strategies; whereas problem-focused, more active coping strategies would probably be more appropriate to face the consequences of the acute cardiac event.

Compared to men, women rely more on social support; indeed, social support has a positive impact on the emotional and relational aspects of women's quality of life, acting as a buffer for psychosocial adjustment after the infarction.

Concluding, the results summarized in this literature review offer insights on factors affecting women's

well-being through the experience of AMI. In particular, these patients' well-being could be increased by a timely access to medical care, and by more service quality in the whole clinical pathway. This would involve studying the representations that health professionals share concerning AMI, and verifying if these representations are distinguished according to the gender of the patients.

Supporting Agencies

The research presented is funded by the Ministry of Health, as part of the Finalized Research Program RF PS2007-3-644382 ("Myocardial Infarction in Women: From Genes to Psychosocial Evaluation").

References

1. Dracup K, Moser DK, Eisenberg M, Meischke H, Alonzo AA. Causes of delay in seeking treatment for heart attack symptoms. *Soc Sci Med* 1995; 40(3): 379-92.
2. Garavalia LS, Decker C, Reid KJ et al. Does Health Status Differ between Men and Women in Early Recovery after Myocardial Infarction? *J Womens Health* 2007; 16(1): 93-101.
3. Conn VS, Taylor SG, Abele PB. Myocardial infarction survivors: age and gender differences in physical health, psychosocial state and regimen adherence. *J Adv Nurs* 1991; 16: 1026-34.
4. Ho PM, Spertus JA, Masoudi FA et al. Impact of medication therapy discontinuation on mortality after myocardial infarction. *Arch Intern Med* 2006; 166(17): 1842-7.
5. Maes S, Leventhal H, de Ridder D. Coping with chronic disease. In: Zeidner M, Endler D (eds.) *Handbook of coping*. New York NY: Wiley 1996: 221-51.
6. Lazarus RS, Folkman S. *Stress, appraisal, and coping*. New York.: Springer 1984.
7. Frasure-Smith N, Lespérance F, Gravel G et al. Social Support, Depression, and Mortality During the First Year After Myocardial Infarction. *Circulation* 2000; 101(16): 1919-24.
8. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. *J Pers Assess* 1988; 52(1): 30-41.
9. Pittman DA, Kirkpatrick KM. Women health and acute myocardial infarction. *Nursing Outlook* 1994; 42 (5): 207-9.
10. Wenger NK, Speroff I, Packart B. Cardiovascular health and disease in women. *N Engl J Med* 1993, 329(4): 274-86.
11. Bello N, Mosca L. (2004). Epidemiology of coronary heart disease in women. *Prog Cardiovasc Dis* 2004; 46(4): 287-295.

12. Young Shin J, Martin R, Howren MB. Influence of Assessment Methods on Reports of Gender Differences in AMI Symptoms. *West J Nurs Res* 2009; 31(5): 553-68.
13. Rankin SH. Response to women recovering from coronary artery bypass surgery. *Sch Inq Nurs Pract* 1993; 7(4): 245-48.
14. Dellborg M, Swedberg K. Acute myocardial infarction: Difference in the treatment between men and women. *Qual Assur Health Care* 1993; 5: 261-5.
15. Agewall S, Berglund M, Henareh L. Reduced quality of life after myocardial infarction in women compared with men. *Clin Cardiol* 2004; 27(5): 271-4.
16. Rosenfeld AG. Treatment-seeking delay among women with acute myocardial infarction: decision trajectories and their predictors. *Nurs Res* 2004; 53(4): 225-36.
17. Rosenfeld AG. Women's risk of decision delay in acute myocardial infarction: implications for research and practice. *AACN Clin Issues* 2001; 12(1): 29-39.
18. Zerwic JJ, Ryan CJ, DeVon HA, Drell MJ. Treatment seeking for acute myocardial infarction symptoms: differences in delay across sex and race. *Nurs Res* 2003; 52(3): 159-67.
19. Løvlien M, Schei B, Hole T. Prehospital delay, contributing aspects and responses to symptoms among Norwegian women and men with first time acute myocardial infarction. *J Adv Nurs* 2008 Jul; 63(2):148-54.
20. Løvlien M, Schei B, Hole T. Myocardial infarction: psychosocial aspects, gender differences and impact on pre-hospital delay. *Eur J Cardiovasc Nurs* 2007; 6(4): 308-13.
21. Dempsey SJ, Dracup K, Moser DK. Women's decision to seek care for symptoms of acute myocardial infarction. *Heart Lung* 1995; 24: 444-56.
22. Rosenfeld AG, Lindauer A, Darney BG. Understanding treatment-seeking delay in women with acute myocardial infarction: descriptions of decision-making patterns. *Am J Crit Care* 2005; 14(4): 285-93.
23. Lefler L. The advanced practice nurse's role regarding women's delay in seeking treatment with myocardial infarction. *J Am Acad Nurse Pract* 2002; 14(10): 449-56.
24. Lefler L, Bondy KN. Women's delay in seeking treatment with myocardial infarction. A meta-synthesis. *J Cardiovasc Nurs* 2004; 19(4): 251-68.
25. Martin R, Lemos K, Bellman B. Gender disparities in common sense models of illness among myocardial infarction victims. *Health Psychol* 2004; 23(4): 345-53.
26. Moser DK, McKinley S, Dracup K, Chung ML. Gender differences in reasons patients delay in seeking treatment for acute myocardial infarction symptoms. *Patient Educ Couns* 2005; 56(1): 45-54.
27. Higginson R. Women's help-seeking behavior at the onset of myocardial infarction. *Br J Nurs* 2008; 17(1): 10-14.
28. Arslanian-Engoren C. Treatment-seeking decisions of women with acute myocardial infarction. *Women Health* 2005; 42(2): 53-70.
29. Schoenberg NE, Peters JC, Drew EM. Unravelling the mysteries of timing: women's perception about time to treatment for cardiac symptoms. *Soc Sci Med* 2003; 56: 271-84.
30. Williams I, Fraser AG, West RR. Gender differences in management after acute myocardial infarction: not 'sexism' but a reflection of age at presentation. *J Public Health* 2004; 26 (3): 259-63.
31. Gevigney G, Mosnier S, Ecochard R et al. Are women with acute myocardial infarction managed as well as men? Does it have consequences on in-hospital mortality? Analysis of an unselected cohort of 80 women and 1.718 men. *Acta Cardiol* 2001; 56(3): 169-179.
32. Clarke KW, Gray D, Keating NA, Hampton JR. Do women with acute myocardial infarction receive the same treatment as men?. *BMJ* 1994; 309: 563-6.
33. Wilkinson P, Laji K, Ranjadayalan K, Parsons L, Timmis AD. Acute myocardial infarction in women: survival analysis in first six months. *BMJ* 1994; 309(6954): 566-69.
34. Evenson KR, Rosamond WD, Luepker RV. Predictors of outpatient cardiac rehabilitation utilization: the Minnesota Heart Surgery Registry. *J Cardiopulm Rehabil* 1998; 18: 192-98.
35. Fridlund B. Self-rated health in women after their first myocardial infarction: a 12-month comparison between participation and nonparticipation in a cardiac rehabilitation programme. *Health Care Women Int* 2000; 21(8): 727-38.
36. Nante N, Messina G, Cecchini M, Bertetto O, Moirano F, McKee M. Sex differences in use of interventional cardiology persist after risk adjustment. *J Epidemiol Community Health* 2009; 63(3): 203-8.
37. Vaccarino V, Every NR, Barron HV, Krumholz HM. Sex-based differences in early mortality after myocardial infarction. *N Engl J Med* 1999; 341: 217-25.
38. Radley A, Grove A, Wright S, Thurston H. Problem of Women compared with those of men following myocardial infarction. *Coronary Health Care* 1998; 2(4): 202-9.
39. Kirchmayer U, Agabiti N, Belleudi V et al. Socio-demographic differences in adherence to evidence-based drug therapy after hospital discharge from acute myocardial infarction: a population-based cohort study in Rome, Italy. *J Clin Pharm Ther* 2012; 37(1): 37-44.
40. Bowers MJ, Buchanan MJ. A group-based program of emotional recovery for younger women recovering from myocardial infarction. *Canadian Journal of Counselling and Psychotherapy* 2007; 41 (2): 77-90.
41. Martin R, Johnsen EL, Bunde J et al. Gender differences in Patients' Attributions for Myocardial Infarction: Implications for Adaptive Health Behaviors. *Int J Behav Med* 2005; 12(1): 39-45.
42. Lauffenburger JC, Robinson JG, Oramasionwu C, Fang G. Racial/ethnic and gender gaps in the use of and adherence to evidence-based preventive therapies among elderly medicare part d beneficiaries after acute myocardial infarction. *Circulation* 2014; 129(7): 754-63.
43. Thow M, Isoud P, White M, Robertson I, Keith E, Armstrong G. Uptake and adherence of women post myocardial infarction to phase III cardiac rehabilitation: are things changing? *Coronary Health Care* 2000; 4(4): 174-8.
44. Setoguchi S, Solomon DH, Levin R, Winkelmayer WC. Gender Differences in the Management and Prognosis of

- Myocardial Infarction Among Patients > 65 Years of Age. *Am J Cardiol* 2008; 101: 1531-6.
45. Dolansky MA, Stepanczuk B, Charvat JM, Moore, SM. Women's and men's exercise adherence after a cardiac event: does age make a difference? *Res Gerontol Nurs* 2010; 3(1): 30-8.
46. Sjöström-Strand A, Fridlund B. (2007). Stress in women's daily life before and after a myocardial infarction: a qualitative analysis. *Scand J Caring Sci* 2007; 21(1): 10-17.
47. Kamm-Steigelman L, Kimble LP, Dunbar S, Sowell RL, Bairan A. Religion, relationships and mental health in midlife women following acute myocardial infarction. *Issues Ment Health Nurs* 2006; 27: 141-59.
48. Murphy BM, Elliott PC, Worcester MU et al. Trajectories and predictors of anxiety and depression in women during the 12 months following an acute cardiac event. *Br J Health Psychol* 2008; 13(Pt 1): 135-53.
49. Wang HX, Mittleman MA, Orth-Gomer K. Influence of social support on progression of coronary artery disease in women. *Soc Sci Med* 2005; 60(3): 599-607.
50. Riegel B, Gocka I. Gender differences in adjustment to acute myocardial infarction. *Heart Lung* 1995; 24(6): 457-66.
51. Kristofferzon ML, Löfmark R, Carlsson M. Myocardial infarction: gender differences in coping and social support. *J Adv Nurs* 2003; 44(4): 360-74.
52. Kristofferzon ML, Löfmark R, Carlsson M. Perceived coping, social support, and quality of life 1 month after myocardial infarction: a comparison between Swedish women and men. *Heart Lung* 2005; 34(1): 39-50.
53. Kristofferzon ML, Löfmark R, Carlsson M. Coping, social support and quality of life over time after myocardial infarction. *J Adv Nurs* 2005; 52(2): 113-24.
54. Bucholz EM, Strait KM, Dreyer RP et al. Effect of Low Perceived Social Support on Health Outcomes in Young Patients With Acute Myocardial Infarction: Results From the VIRGO (Variation in Recovery: Role of Gender on Outcomes of Young AMI Patients) Study. *J Am Heart Assoc* 2014; 3: e001252.
55. Bogg G, Thornton E, Bundred P. Gender variability in mood, quality of life and coping following primary myocardial infarction. *Coronary Health Care* 2000; 4: 163-8.
56. Endler NS, Parker JD. Multidimensional assessment of coping: a critical evaluation. *J Pers Soc Psychol* 1990; 58: 844-54.
57. Panthee B, Kritpracha C, Chinnawong T. Correlation between coping strategies and quality of life among myocardial infarction patients in Nepal. *Nurse Media Journal of Nursing* 2011; 1(2): 187- 94.
58. Jalowiec A. Confirmatory factor analysis of the Jalowiec Coping Scale. In Waltz CF, Strickland OL (Eds.), *Measurement of Nursing Outcomes*, vol. I: Measuring client outcome (pp. 287-308). New York: Springer Publishing Company 1988.
59. Brink E, Karlson BW, Alberg LR. Health experiences of first time myocardial infarction: factors influencing women's and men's health related quality of life after five months. *Psychol Health Med* 2002; 7(1): 5-16.
60. White J, Hunter M, Holtum S. How do women experience myocardial infarction? A qualitative exploration of illness perceptions, adjustment and coping. *Psychol Health Med* 2007; 12(3): 278-88.

Accepted: 7 January 2015

Correspondence:

Chiara Foà

University Teaching Hospital

Via Gramsci, 14 - 43126 Parma

Tel. +39 0521 704720

E-mail: chiara.foa@unipr.it