

## Marital Satisfaction, Anxiety, and Health-Related Quality of Life in Myocardial Infarction Patients

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### Abstract

Anxiety is predictor of cardiac incidents and mortality, its relationship with Health-Related Quality of Life (HRQL) remains unclear, especially in married couples, yet a marital relationship as part of the immediate environment that can be a source of support or stress. The objective of this study is to shed light on the relationship between anxiety and HRQL by adding marital satisfaction as an independent predictor and moderator. A cross-sectional study was conducted on 214 myocardial infarction patients. The patients completed three questionnaires (McNew Health-Related Quality of Life, Couple Satisfaction Index, Cardiac Anxiety Questionnaire), analysed using a four-step moderated hierarchical multiple regression. In conclusion, anxiety and marital satisfaction significantly predict patients' HRQL. There were no significant interaction effects between anxiety and marital satisfaction in predicting HRQL. These findings could spur further research in addressing the limitations of this study and similar studies, which in turn may direct future policies in healthcare.

**Keywords:** *Anxiety, Health-Related Quality of Life, Marital Satisfaction, Myocardial Infarction.*

### Introduction

Coronary heart disease (CHD) is a cardiovascular disease caused by blocked or restricted blood vessels in the heart. Constriction of heart vessels reduces the blood and oxygen supply to the heart and may be a cause of heart muscle death. Myocardial infarction (MI), a CHD, is frequently termed as a critical illness because of its life-threatening effects [1]. According to the World Health Organization in [2], CHD contributes to half of mortalities worldwide and is the leading cause of mortality in Indonesia.

Disability-adjusted life year (DALY) is the measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death. One DALY can be thought of as one lost year of "healthy" life. CHD is among the major contributors to DALY among Indonesians above 15 years

old, with DALYs contributing 20% against the Total DALYs in Indonesia [3]. In Indonesia, coronary heart disease is not only one of the leading cause of death but also that of disability [4]. Coronary heart disease is heart disease caused by blocked or restricted blood vessels in the heart.

Constriction of heart vessels reduces the blood and oxygen supply to the heart and may be a cause of heart muscle death. Literature search on NCBI, PubMed, and Google Scholar on articles published between 2014 up to the current year, with search terms "coronary artery disease", "myocardial infarction", "quality of life", "marital status", "psychology" and "Asian" yielded studies on Chinese and Middle Eastern populations. Limiting the search further to Indonesians, only one study was able to fulfil all criteria.

Ginting, Nurmaini, and Sitohang [5] investigated the members of the Toba Batak tribe who underwent coronary artery bypass grafting. This study was limited to its qualitative study design and small sample size. Removing “marital status” and “psychology” in the search terms yielded more studies done on Indonesian populations, but most of these focus on risk factors and burden of disease in terms of sequela of cardiovascular disease than on the psychological aspects of the disease. Wulandari et. al. [6].

Acknowledged the lack of adapted health-related quality of life measurement in the country hence validated the Indonesian version of the MacNew questionnaire with satisfactory results. Hence, this investigation is conducted to highlight the importance of the psychosocial aspect of disease management in terms of determining the influence of marital status and satisfaction as a predictor of health-related quality of life (HRQL) Quality of life is an “individual’s realisation of his/her position in life in the context of the prevailing culture and beliefs and in relation to his/her goals and concerns” [7].

As such, not only treatment outcomes are evaluated but also how said treatment affects the general wellbeing of the person. The research gap identified is that although there have been numerous previous studies on the relationship between anxiety and HRQL; there is still need for further studies and investigation on the same, especially in married couples. Although the effects of marital relationships on health have been found, the dynamics among anxiety, marital satisfaction, and HRQL have not been fully understood.

## Literature Review

### Myocardial Infarction (MI)

Myocardial Infarction (MI) is a coronary heart disease frequently taken as a critical illness because of its life-threatening effects [1]. MI causes debilitating changes physically, psychologically, and socially. MI causes debilitating changes physically, psychologically, and socially. MI patients usually have chest pain, dyspnoeic and experience overwhelming fatigue [8].

The physical limitations can cause alienation, social oversensitivity, impatience, and depression [9]. Smolderen et al [10]. Note that anxiety is a common sequela of MI, occurring among 30-40% hospitalized patients, and presents as the earliest psychological response to myocardial infarct, while the first symptoms of depression occurs between 48-72 h after MI. Consequently, depressive symptoms manifest in about a third of patients who suffered an AMI, and about one in five suffers from a major depressive disorder. A lack of attention from medical personnel to a patient’s feelings or needs could increase difficulty coping [11, 12].

The Coronary Patients Evaluation Study (COPEs) and the Comparison of Depression Interventions after Acute Coronary Syndrome (CODIACS) trials were initiated in 2013. Protocols involved a choice of treatment consisting of problem-solving therapy and/or pharmacotherapy and continuous monitoring of depressive symptoms, adapting the care as necessary. The trials were “instrumental in identifying successful components of integrated depression care in a cardiology specialty care setting”. Patients in both studies had greater relief of depressive symptoms and greater satisfaction with their treatment [10].

The physical limitations can cause alienation, social oversensitivity, impatience, and depression. A lack of attention from medical personnel to a patient’s feelings or needs could increase difficulty coping [11, 12]. MI patients must also change their way of life, following a healthier lifestyle, consuming low-fat food, performing more exercise, and stopping smoking.

Necessary medical interventions such as percutaneous intervention or coronary bypass grafting surgery might create fear or anxiety for the MI patient [13]. Anxiety and depression prevalence among post percutaneous coronary intervention patients is 25-37% and 67%, respectively, in the first week after the procedure [14].

Moreover, results from Amouzeshi et al [15]. Study stated a significant difference between depression scores before and after surgery in patients undergoing CABG surgery. The effects of the disease and its treatment on a patient’s assessment of his/her life can be

defined as a health-related quality of life (HRQL).

### Health-Related Quality of Life (HRQL)

HRQL is a multidimensional construct defined by a patient's subjective assessment of how his or her physical abilities and social, health, and psychological conditions are affected by a disease and its treatment [16]. HRQL dimensions range from health status, functioning, and economic impact to welfare (well-being) [17]. According to Coomans et al [18], HRQL scores can be used to determine what treatment is the most suitable for a patient's condition and serve as prognostic information.

For patients, an HRQL score can be used as a basis for making decisions about what treatment would be the most suitable according to his or her conditions and life plans. HRQL has been studied and has produced validated questionnaires [19, 21]. Usage of this metric among patients with MI has been found to be related to several emotional problems, which include depression and anxiety. Depression and anxiety are very common psychological reactions after a cardiac event [11, 22, 23].

Thus, depression plays a significant role not only in the mortality and morbidity of a cardiac patient [24, 25, 9] but also in their HRQL [26, 27, 23, 28]. However, the role of anxiety in cardiac patients' mortality or morbidity has received less attention. Nevertheless, the role of anxiety in the mortality and morbidity of heart patients is substantial. In a 10-year follow-up on a longitudinal study conducted in the Netherlands on 438 MI patients, it was found that generalized anxiety disorder was associated with an almost twofold increased risk of adverse outcomes independent of demographic and clinical variables and depression [29].

A similar result was also found by Martens et al [30]. In a 7-year prospective study in San Francisco, this concluded that anxiety was associated with 62% higher rates of cardiovascular events. Corroborating these results, two years post MI; patients have a higher risk for anxiety disorders compared to non-MI patients [31]. However, the role of anxiety in patients' HRQL was inconsistent.

Studies conducted by Staniute et. Al. and Wang et. Al. [32, 28]. Concluded that anxiety contributed to a negative HRQL score whereas studies conducted by Fagring et al [33]. Hosseini et al [26] and Muhammad et al [27]. Reported no association. Patients with MI had significantly better HRQL than patients with stable coronary artery disease or heart failure, with higher scores on the MacNew global scale and each subscale.

There were no differences between patients with stable coronary artery disease and those with heart failure [34]. A non-uniform definition of anxiety may explain the inconsistency. Several studies use generalized anxiety disorder [30, 29], hospital anxiety [35, 36] or trait anxiety [26, 37]. Hence, specific measurements for anxiety concerning heart disease should be used more often, because it is essential to differentiate between cardiac anxiety from general anxiety in psychiatric patients [38].

### Marital Support in MI and HRQL

There is mounting evidence that social support is beneficial in reducing the negative effects of MI in patients HRQL [39, 32, 40]. One source of social support is from the marital relationship. Married people tend to have better health than single people. Marital relationships ensure social support and health-promoting behaviour, as well as the availability of socioeconomic resources. Married people tend to have lower cardiac-disease risk factors [41].

A study by Buursma et al [42] on 156 noted that perceived social support was significantly higher in married/partnered patients compared to unmarried/unpartnered patients. Consequently, Consuegra-Sánchez et al [43] showed that widowed patients exhibited a significantly higher mortality. In a multivariable analysis accounting for age, comorbidities (e.g. diabetes, hypertension, dyslipidaemia), symptoms, the condition of widows compared to those married – was independently associated with a higher all-cause mortality in contrast to single and divorced patients.

Lack of social support, perceived stress of the disease and deprivation associated with widowed status were the contributing factors of mortality among widows.

Wang et al [28] and Salazar et al [44] concurred that married people having higher HRQL compared with single individuals and widows, with the former more affected in mental dimensions (i.e. vitality, social functioning, mental health) while the latter in physical dimensions (i.e. physical function, body pain, general health). According to Slatcher [45], these findings can be explained by social integration, or greater integration into one's social network, which can be derived from marital relationships such as identity, purpose, self-worth, and positive affect, produce health-promoting activities.

Nevertheless, a marital relationship not only provides support, but it can also be a source of stress. Marital relationships that provide support, companionship, and equality in decision making can be defined as having marital strength, whereas marital relationships that feature negative behaviours during problem-solving can be defined as providing marital strain.

Several studies have concluded that the protective effects of marital relationships on health only happen in cases of high marital satisfaction [41, 46]. In a longitudinal study, Proulx & Snyder-Rivas [46] found a unidirectional relationship between marital satisfaction and self-rated health, with people who have high marital satisfaction being inclined to rate themselves as healthy. Another study conducted in 31 older couples reported that marital conflict resulted in lower immunological response and endocrine changes [47]. A meta-analytic study on 126 published articles had similar findings [48]. Thus, it can be assumed that there is a positive relationship between marital satisfaction and HRQL. Marital relationships not only protect the individuals involved; they can also act as buffers against negative events in life.

Slatcher [45] proposed a stress-buffering model, according to which marital relationships are beneficial because they can provide a source of support and a means of coping with stress for individuals in difficult times in their lives. Cardiac events are stressful for many because they are life threatening. Based on the empirical findings presented, it is assumed that marital satisfaction moderates the relationship between anxiety and HRQL. The relationship between anxiety and HRQL still requires

investigation, especially in married couples. Although effects of marital relationships on health have been found, the dynamics among anxiety, marital satisfaction, and HRQL have not been fully understood.

This study investigated the impact of anxiety and marital satisfaction and their interaction on MI patients' HRQL. The hypotheses of the study are:

- Cardiac anxiety is inversely related to the patient's HRQL.
- Marital satisfaction is a significant predictor for patient's HRQL.
- Marital satisfaction is a significant moderator in the relationship between cardiac anxiety and patient's HRQL.

## Research Method

### Design

The study was performed using a cross-sectional design with patients diagnosed with MI from Indonesia's National Heart and Cardiovascular Centre in Jakarta.

### Participants

The participants were 214 patients diagnosed with MI (25 females and 189 males from 45–71 years old). The inclusion criteria involved patients who had elevated troponin or creatine kinase in the last 24 hours, ischemic symptoms for more than 20 minutes, or T wave changes on an electrocardiograph, were married, and agreed to take part in the study. The exclusion criteria for the study involved patients who had uncontrollable arrhythmia, were single, or diagnosed with a mental problem found in the DSM-IV TR.

### Procedure

The study was conducted in Jakarta, Indonesia from November 2016 to June 2017. The patients were diagnosed with MI at the Indonesia National Heart and Cardiovascular Centre. After their regular check-ups, the respondents were approached. Only those who were eligible and willing to participate were given the questionnaire. The criteria for the respondents were: diagnosed with MI, married, not previously diagnosed with depression, aged between 40-

65 years old. Most respondents did not want to fill out the questionnaire independently; thus, the researcher and assistant researcher assisted the patients by reading out the items from the questionnaire directly to the patients and taking down their answers.

Informed consent was requested from the patients before data intake, and ethical approval from the Hospital and the University of Indonesia was obtained before the study was conducted. In total, there were 235 willing participants. After they were screened according to the inclusion criteria, the total number of participants was 214.

## Measurement

The HRQL of MI patients was assessed using the MacNew Heart Disease HRQL Instrument. MacNew is a valid and reliable Likert instrument used to measure heart patients' HRQL. MacNew consists of 27 items with seven options for answers for each question. MacNew measures three domains of patients' HRQL: physical, psychological, and social well-being. The global total score and that for each domain are derived from the mean score of answered question. Unanswered items are not included in the calculations, and if the patients do not complete more than half of the total items in one domain, the score for that domain cannot be calculated.

The score for each domain ranges from 1-7, with higher scores indicating higher HRQL [49]. The internal consistency of this scale for this population is 0.903. Wulandari et al [6] adapted the questionnaire among 236 participants diagnosed with MI without psychiatric comorbidities. The internal consistency of their questionnaire was acceptable (0.816-0.900), thus, the structure of the Indonesian McNew questionnaire is equivalent to the parent language version.

Anxiety was measured using the Cardiac Anxiety Questionnaire (CAQ). CAQ is an instrument made on a Likert scale that consists of 18 items with five options for each answer, from 0 (never) to 4 (always). The score for the total and subscale is from the mean score of the questions answered.

Factor analytic study found three subscales: fear regarding heart disease, escapist behaviour, and attention focus. CAQ is a valid and reliable instrument and has been

proven to be different from the general anxiety measurement [38]. Cronbach's  $\alpha = 0.821$  for the overall measure, indicating good internal consistency. Likewise, Wulandari et al [6] study had a Cronbach's  $\alpha = 0.808$ . Marital satisfaction was measured using the Couples' Satisfaction Index (CSI) [50]. CSI consists of seven items in a semantic differential type of questionnaire, with answering options rated from 0–5, and 6 items of Likert scale type rating, with six options for each answer (do not agree to agree).

The internal consistency for CSI in this population is 0.936. The left ventricular ejection fraction (LVEF) is an overall measure for cardiac function. The score for the LVEF was taken from the patient's medical record, specifically from the echocardiography report. The LFEV is a percentage. The normal LFEV for adult patients is between 55-70%, where an LVEF less than 35% is a sign of congestive heart failure (CHF) [13]. The LVEF score was then categorized into moderate to severe ( $\leq 40\%$ ) and normal to mild ( $> 40\%$ ) [32].

Co morbidity was measured using the Charlson Comorbidity Index (CCI), summarizing the number of comorbidities of the patients. The CCI is a measurement that includes weighting factors based on the severity of the disease. The system was originally developed as a prognostic indicator for patients with a variety of comorbid conditions who were admitted to general medical service. Since it was first published, the CCI has been commonly used to measure patients' comorbidity). The more comorbid conditions, the higher the CCI score. The CCI score was categorized into no comorbidity (score = 0), moderate comorbidity (score: 1-2), and severe comorbidity (score  $\geq 3$ ) [51].

The Charlson comorbidity index (CCI) is the most extensively studied and most widely used comorbidity index in the medical literature [52]. The widespread use of this index could be explained by the fact that it is not designed for patients with a particular disease and is recommended when overall mortality is the outcome of interest [52]. It does not require extensive information, which makes it appealing to researchers who access administrative data rather than individual clinical notes [53].

## Statistical Analysis

IBM SPSS Statistics version 21 was used to analyse the data. The personal coefficient was used to assess the association between marital satisfaction, cardiac anxiety, and HRQL. One-way analysis of variance (ANOVA) was used to determine the effects of age and educational level on patients' HRQL. The moderating effects of marital satisfaction on the relationship between cardiac anxiety and HRQL were examined with using a four-step hierarchical regression.

In the first step, the sociodemographic variables of the patients, namely age, sex, educational level, and monthly income, were entered together with comorbidities and LVEF. After controlling for sociodemographic and illness variables, the second step

examined the cardiac anxiety level of patients to discover the predictability of anxiety for patients' HRQL. Marital satisfaction was entered to test the strength of its association with HRQL. The final step examined the interaction between anxiety and marital satisfaction.

## Results

Demographic data and clinical characteristics can be seen in Table 1. The participants of the study consisted of 25 female patients and 189 male patients from 45-71 years old.

Additionally, 38.8% of the participants had also been diagnosed with diabetes mellitus and 55.5% of the participants were categorized as having normal to mildly impaired heart function.

**Table 1: Demographic Data and Clinical Characteristics (N=214)**

Variable	Mean ± SD
Age (years)	58 ± 18
	N (%)
Sex	
Male	189 (88%)
Female	25 (12%)
Comorbidities	
Diabetes Mellitus	83 (39%)
Impaired Heart Function	119 (56%)
Others	11 (5%)

A series of t tests revealed found that a significant mean difference in HRQL between male and female patients,  $t(203) = 2.216$ ,  $P < 0.05$ . Male patients ( $M = 4.98$ ) had higher HRQL than female patients ( $M = 4.60$ ). However, there were no significant differences in HRQL between moderate to severe and normal to mild LVEF patients,  $t(183) = 1.710$ ,  $P = \text{non-significant}$

Four separate ANOVAs were used to examine differences in patients' HRQL based on age, educational level, monthly income, and comorbidity. There were no significant differences in patients' HRQL based on age  $F(6,195) = 0.713$ ,  $P = \text{nonsignificant}$ , educational level  $F(4,200) = 0.916$ ,  $P = \text{nonsignificant}$ , monthly income  $F(3,198) = 0.648$ ,  $P = \text{nonsignificant}$  and comorbidity  $F(1,190) = 0$ ,  $21$ ,  $P = \text{non-significant}$ .

To explore the dynamics of the relationship between anxiety, marital satisfaction, and HRQL, a four-step moderated hierarchical regression was carried out. The first step, which included the demographic and clinical characteristics of MI patients, revealed a nonsignificant model  $F(6, 151) = 2.061$ ,  $P = 0.061$ . This model explained 3.9% of the variance of HRQL. As can be seen in Table 2, only patients' gender was a significant predictor of HRQL ( $\beta = 0.190$ ,  $P < 0.05$ ). The second step, which included cardiac anxiety, boosted the variance explained by the model

by 28.5%. The results of the analysis showed that higher cardiac anxiety was lowered patients' HRQL ( $\beta = -0.553$ ,  $P = 0.00$ ). The second model indicated a 33.1% variance in HRQL. The second model significantly predicted MI patients' HRQL  $F(7,150) = 12.012$ ,  $P = 0.00$ . The third step, which included patients' marital satisfaction, also revealed significance  $F(8,149) = 14.006$ ,  $P = 0.000$ . The third model explained 40% of the total variance of HRQL.

As shown in Table 3, the higher the marital satisfaction was, the higher the patients' HRQL was ( $\beta = 0.271$ ,  $P = 0.00$ ). Finally, the fourth step showed a nonsignificant model that included interaction effects between anxiety and marital satisfaction. Thus, it is concluded that there are no moderation effects for marital satisfaction on the relationship between cardiac anxiety and HRQL. The final model explained 39.5% of the variance in HRQL.

**Table 2: Four-step Hierarchical Analysis on Cardiac Anxiety vs. Demographics, HRQL, and Marital Satisfaction**

Variables	Model 1				Model 2	Model 3	Model 4
	F	p	B	$\sigma^2$	$\sigma^2$	$\sigma^2$	$\sigma^2$
Demographics	2.061	0.061		3.9%			
HRQL	12.012	0			33.1%		
Marital Satisfaction	14.006	0	0.271			40%	
							39.5%

## Discussion

This study examined the dynamics of the relationships among anxiety, marital satisfaction, and HRQL in MI patients. The study was carried out on 215 MI patients in Indonesia's National Heart and Cardiovascular Centre. The first hypothesis was that cardiac anxiety would be inversely related to patients HRQL.

The results indicate that cardiac anxiety was a significant predictor of patients HRQL. This result was consistent with the result of the study conducted by Blakemore et al [54]. In that meta-analysis study, anxiety was significantly correlated with HRQL in a 1-year follow-up in chronic obstructive pulmonary disease. Another study carried out by Kepka et al [55].Yielded a similar result.

In that study, which included 1529 patients with various chronic diseases, it was found that anxiety was significantly correlated with HRQL. In cardiac patients, a study conducted by Watkins et al [36].With 934 cardiac patients found that patients with anxiety had more elevated activity in the sympathetic nervous system, more inflammation, and more hypertension. Anxiety was also associated with increased mortality in cardiac patients in a 3-year follow-up.

Morys et al [34]'s cross-sectional study on 336 patients with stable CAD (n = 115), MI (n = 112), and heart failure (n = 105) revealed that those with MI most frequently reported anxiety symptoms (57.10%), while those with symptoms of stable coronary artery disease react to their illness with anxiety more than depression. The highest MacNew HRQL scores were reported by patients after myocardial infarction.

However, anxiety is generally more prevalent across all groups. Likewise, all groups had a negative correlation between the symptoms of both the HADS level of anxiety and depression scale and HRQL. It seems that anxiety during hospitalization after cardiac

events hinders patients' motivation to seek out and comply with health-promoting behaviour, thus increasing the severity of the disease in the long run. The results imply that patients with MI would benefit from psychotherapeutic interventions such as cognitive-behavioural therapy to alleviate anxiety and increase the competence of the patient in the control of anxiety. It seems that anxiety during hospitalization after cardiac events hinders patients' motivation to seek out and comply with health-promoting behaviour, thus increasing the severity of the disease in the long run.

Another hypothesis, which assumed that marital satisfaction would be a significant predictor of patient's HRQL, was also supported by the results of statistical analysis. Marital relationships may act as the main source of support or stressors for chronic patients [45]. This finding is in line with the results of a study of 129 patients with type 2 diabetes. The study found that a patient's spouse interacts with the patient in his or her illness management, such as lifestyle changes or medication adherence.

This interaction can be perceived as support or control by the patients. If a patient perceives the interaction as social control, he or she may feel less enjoyment and a tense marital interaction will be produced. The less positive the emotion the patients feel, the less likely they are to adhere to disease management [56].

A similar result was found by Holt-Lunstad, Birmingham, and Jones [57], who examined 303 individuals by marital status. They concluded that having a high marital quality was associated with lower blood pressure, lower stress, lower depression, and higher subjective well-being. Furthermore, in a meta-analysis study carried out by Robles et al [48]. Encompassing 72,000 individuals across 126 studies in 50 years of research from several countries, it was found that marital quality, defined by perceived satisfaction with one's relationship, was related to better physical health, self-rated

health, and lower cardiovascular activity both in healthy individuals or individuals with chronic diseases.

In a retrospective cohort study of 2100 patients with MI after percutaneous coronary intervention and medical therapy, including adherence to dual antiplatelet therapy, which assessed marital status and risk for cardiovascular outcomes after an MI, 72% (n = 1519) were married or common-law and living together, whereas 17% (n = 358) and 11% (n = 223) were separated, divorced, or widowed, and were never married, respectively.

There was no significant difference in adherence to dual antiplatelet therapy across all groups. Separated, divorced, or widowed women were significantly ( $p = 0.03$ ) at greater risk for cardiovascular outcomes after an MI (e.g. HF/shock) compared with married women during a 15-month follow-up period, whereas there were no differences in risk were observed among the men in COAPT.

The study postulated that the unmarried groups (never married, separated, divorced, or widowed) are more vulnerable as they had more pre-existing risk factors such as older age and history of smoking, HF, and stroke. Moreover, the mental and physical health of unmarried individuals may be poorer compared to their married counterparts, due to the shifting emotions caused by changes in marital status and likelihood to suffer from chronic illnesses, which makes them utilize more healthcare resources. Marital status also may have disparate impact in a primary-prevention setting compared with a secondary-prevention setting.

Furthermore, following an MI, patients' marital status may influence motivation to engage in healthy behaviours and to adhere to medical therapy to a greater extent compared with primary [58]. Slatcher [45] proposed a model in which marital strength as an independent predictor can induce a positive psychological state, which in turn motivates people to take care of themselves and enhances their immune function. However, the third hypothesis, that marital satisfaction interacts with anxiety in predicting HRQL of MI patients, was not supported by the results of the present analysis.

A similar result was obtained by Coyne et al [59]. That study, which included 189 CHF patients, was conducted over 4 years and examined the predictability of marital quality and the severity of CHF. It was found in that study that marital quality independently predicted patients' survival 4 years after controlling CHF severity.

However, marital quality did not interact with CHF severity to predict patient mortality. Komasi and Saedi's [60] study on 683 patients diagnosed with MI undergoing a Cardiac Rehabilitation Program which stratified patients according to sex, showed that marital stress is significantly higher among females compared to males, both before adjustment for age, education level, anxiety, and depression ( $p < 0.001$ ) and after it ( $p = 0.042$ ). Using the Beck anxiety Index and Hudson's Index of Marital Stress, there was significant difference ( $p < 0.001$ ) between males and females in terms of education level, occupation, anxiety, and depression.

Gender is a factor that affects more negative perception of marital interactions in women. They postulated that women are more sensitive to familial stress than men and marital arguments affect their psychological and physiologic health more prominently, as they usually spend more time about thinking of marital relationship especially its negative aspects.

They report a higher level of marital stress due to their stronger emotional responses, as the quality of the marital relationship is generally affected by the perceived quality of the support by spouse. In a literature review by Slatcher [45], the protective effects of marital quality could be explained by the main effects-model and the stress-buffering model. In the stress-buffering model, marital quality acts as a moderator between stress and health.

This means that the effects of stress on health are diminished by marital quality or satisfaction. Marital relationships are thought to provide support and resources in difficult times. Dupre and Nelson [61] supported this notion in arguing that long, continuous marriages provide stability in socioeconomic, behavioural, and psychosocial resources that accumulate and solidify over time.



Faced with a heart attack, we suspect that those with long durations of marriage draw from multiple protracted resources to better manage disease and prolong survival after experiencing a life-threatening event. However, only marital strength (as expressed in resolutions of disagreements, supportiveness, equality in decision making, and companionship) can act as a buffer in the relationship between stress and health. Furthermore, the negative and positive aspects of marital relationships tend to be independent of one another, each predicting the psychological and physical functioning of an individual.

This study has practical implications for medical personnel who treat MI patients. One of its conclusions is anxiety plays a significant role in determining the HRQL of patients. Thus, it is important to identify patients with symptoms of anxiety and focus on their anxiety to promote better HRQL. Anxiety plays a role in patients' motivation and health-seeking behaviours after an MI. Psychotherapeutic intervention done among patients identified with anxiety can alleviate anxiety and increase the competence of the patient in the control of anxiety.

Marital satisfaction was also found to be related to patients' HRQL; thus, medical personnel, though marital counselling, could encourage a patients' spouses to focus on building a more supportive environment for the patients without creating stifling, overprotective support. There are implications of the study on the importance of marital satisfaction as a protective factor to buffer the effects of anxiety in MI patients. It is concluded that marital satisfaction does not interact with anxiety in determining a patient's HRQL. Marital satisfaction is operationalized by self-reported satisfaction and positive emotion in the marital relationship [48]. However, the definition of

marital satisfaction is focused not only on the dyadic relationship between couples but also on their family members, such as the number of their children or their family's accomplishments [62]. Thus, the definition of marital satisfaction should be explored. Given that the study was conducted cross-sectionally, it is difficult to determine the long-term effects of anxiety and marital satisfaction in patients' HRQL. Thus, it is advisable to measure research variables on several timelines to determine the pathway of causality.

The second limitation is the imbalance in numbers of male and female patients recruited in the study; thus, it is difficult to compare the genders to find the role of gender among the study variables. The third limitation is the measurement of marital satisfaction. Items in this measurement tend to have a social desirability bias because respondents tend to claim that they are satisfied with their marriage.

Since the study's sample was not gathered randomly, the generalization of its results to all Indonesian MI patients should be undertaken with caution. Although this study has some limitations, it also has several strengths. First, it simultaneously examined the role of anxiety and marital satisfaction. In addition, the study may create a meaningful basis for understanding more about HRQL in MI patients, especially in terms of the impact of the immediate environment on patients' HRQL.

## Conclusion

This study identified individual and social factors that contribute to patients' HRQL. The authors argue that it is important to pay attention not only to the physical characteristics of illness but also to psychological and social factors, especially in the immediate environment [63].

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