Health Related Quality of Life Model among Patients with Myocardial Infarction in Indonesia

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Abstract

Myocardial infarction is one of chronic illnesses that has significant effects to patient's health related quality of life. This study tested three psychosocial factors (i.e. religious coping behaviour, cardiac anxiety and marital satisfaction) and two disease-related factors (i.e. left ventricular ejection fraction, comorbidity) in predicting health related quality of life in patients with post myocardial infarction in Indonesia. A cross sectional study included 170 patients with myocardial infarction was conducted. The patients completed four questionnaires: MacNew Health Related Quality of Life, Couple Satisfaction Index, Cardiac anxiety Questionnaire, and religious coping behaviour. Proposed model was tested using structural equation modelling. Results revealed that cardiac anxiety has a significant negative relationship with health-related quality of life. Marital satisfaction was a significant moderator in the relationship between cardiac anxiety and health related quality of life. There were no significant relationships among patient's comorbidity, left ventricular ejection fraction, religious coping behaviour and health related quality of life. Results of the study shed the light of the importance of protective effects of patient's immediate environment in shaping patient's health related quality of life.

Keywords: Health related quality of life; marital satisfaction; Left Ventricular Ejection Fraction; religious coping behaviour; Cardiac anxiety

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Introduction

Although definition of health related of quality of life (HRQoL) is still debatable, HRQoL can be defined as subjective multidimensional perception of life quality influenced by disease symptoms, treatment side effects and functional limitation (Abdullah & Jamal, 2011; Cella & Stone, 2015; Höfer, Lim, Guyatt, & Oldridge, 2004). Benefits of studying HRQoL is not only important for patients but also for health professionals. According to Ganz and Goodwin (2005) HRQOL score can determine the effectiveness of a treatment so the patients can decide the most suitable treatment. HRQOL score also predicted several prognostic informations (psychological wellbeing, levels of anxiety and depression) associated with disease development. HRQOL can be used by decision-makers in determining policy that best suits a country's economic conditions and the expected quality of the survivors.

In Indonesia, the number of deaths caused by coronary heart disease (CHD) is increasing rapidly up to 80% in the last decade (Institute of Health Metric and Evaluation, 2010). According to The National Health Survey in 2013, CHD is accounted for 37% of total death in Indonesia (Indonesia Ministry of Health, 2013). Myocardial infarction (MI), as one of acute CHD, also termed as critical disease since its life threating effects (DeSilva, 2013). Not only as critical disease, MI also has significant effects to patient's health-related quality of life (HRQOL). Patients with MI experience uncertainty about their future and have to adjust their life with physical challenges and adhere with the illness treatment (Andersson, Borglin, & Willman, 2013; Roebuck, Furze, & Thompson, 2001). Although escalation of the number of patients with MI in Indonesia is concerning, however research on Indonesian MI patient's HRQOL is limited. Many HRQOL studies were conducted in European countries (Kang, Gholizadeh, Inglis, & Han, 2017). Therefore, it is difficult to apply the results of those studies in another country with different contextual backgrounds.

Many researches on MI patient's HRQOL have been conducted in the past decades. Despite a mounting evidence regarding predictors of HRQOL in MI patients, several predictors still need further exploration. Anxiety are emotional state that usually dominate patients especially after cardiac event (Andersson et al., 2013; Roebuck et al., 2001; Sanderson, 2013). Prolonged anxiety on MI patients was related with adverse cardiac events (Martens

et al., 2010; Roest, Zuidersma, & de Jonge, 2012; Van Beek et al., 2012) and mortality (Watkins et al., 2013). However, results regarding relationship between anxiety and HRQOL in MI patients remain inconclusive. Anxiety contributed to negative HRQOL score (Kang et al., 2017; Kepka et al., 2013; Muhammad et al., 2014; Staniute et al., 2015; W. Wang et al., 2014) while another studies found no association (Fagring et al., 2008; Hosseini, Ghaemian, Mehdizadeh, & Ashraf, 2014; Muhammad et al., 2014). Different definition of anxiety used in those studies was suspected to play a part. Thus, the present study used more specific measure for anxiety regarding heart disease, namely cardiac anxiety. People with cardiac anxiety usually feel anxious when they feel sensations related with their heart. It is reported that cardiac anxiety was related with depressive symptoms and lower HRQOL (Van Beek et al., 2012).

An important aspect in helping patients to have a better adjustment post MI is social support, especially from their closest surroundings. Marital relationship provides more significant role in health compare to other non-cohabitating or cohabiting social network (Gallo, Troxel, Matthews, & Kuller, 2003; Robles, Slatcher, Trombello, & McGinn, 2014). Marital relationship especially important for chronic disease patients since it helps for adjustment and adherence to disease treatment (August, Rook, Franks, & Parris Stephens, 2013; DiMatteo, 2004; Joekes, Maes, & Warrens, 2007; Robles et al., 2014). Yet, only in high marital satisfaction that one can enjoy the benefits of marital relationship (Gallo et al., 2003; Proulx & Snyder-Rivas, 2013). Furthermore, several studies in chronic patients concluded a positive relationship between marital satisfaction and HRQOL (Galbraith, Arechiga, Ramirez, & Pedro, 2005; Trief, Wade, Britton, & Weinstock, 2002). Marital satisfaction is not only act as independent predictor of patient's HRQOL, but it is also expected to moderate effects of anxiety to HRQL. Satisfying marital relationship is related to marital disclosure, a situation that a person opens up about their feelings and thoughts to their spouse (Slatcher, 2010). When patients feel anxious about their health condition, the spouse can give consolation and reassurance to the patients so the stressful situation caused by MI can be view as less threatening. Thus, the negative effects of anxiety can be reduced.

In Indonesia, religiosity serves as important contextual factor. Contextual factors must be taken into account because of their significant impact on HRQOL (Kimlin T. Ashing-Giwa & Lim, 2008, 2010; Kimlin Tam Ashing-Giwa, 2005; Miller, Ashing, Modeste, Herring, & Sealy, 2015). Indonesian people integrate their religious belief for understanding their experiences and the world (Sallquist, Eisenberg, French, Purwono, & Suryanti, 2010). When religious people were diagnosed with chronic disease, they frequently use religious coping to deal with changes and challenges accompanied chronic disease (Karekla & Constantinou, 2010). The contribution of religious coping in health has received a significant attention. It is reported that religious coping helps patients to accept their illness, adherence to medical treatment and health behaviours, maintain self-esteem, provide hope and meaning (Karekla & Constantinou, 2010; Pargament, Koenig, Tarakeshwar, & Hahn, 2004; Tarakeshwar et al., 2006; Thuné-Boyle, Stygall, Keshtgar, & Newman, 2006; Williams, Jerome, White, & Fisher, 2006). It is concluded that religious coping is consisted of two specific form namely: religious support from God and religious hope. People who use religious coping belief the benevolence of God, thus in difficult situations such as post MI, they can look for support from God and hope that God will help them through difficult times (Abu-Raiya, Pargament, & Krause, 2016). With this belief patients can see their health situation as less threatening hence the negative effects of anxiety can be attenuate.

HRQOL is also related with disease related factors. Left ventricular ejection fraction (LVEF) is frequently used in heart patient research as an indicator of severity of MI (Kang et al., 2017). LVEF is the most frequently used non-invasive predictor to mortality prognosis in MI patients, stable coronary artery disease and heart failure (Pettersen, Kvan, Rollag, Stavem, & Reikvam, 2008). Low LVEF score in heart patients indicates low level of oxygen in one's blood flow which may cause fatigue, oedema, sleeping disturbance, depression and angina, thus it is associated with low level of HRQOL (Pelle, Pedersen, Szabó, & Denollet, 2009; Pettersen et al., 2008; Spindler, Denollet, Kruse, & Pedersen, 2009).

Comorbidity is defined by the number of coexisting diseases (Xuan, Kirchdoerfer, Boyer, & Norwood, 1999). In MI patients, comorbidity is not only detrimental to patient's general health but may also induce physical limitation and more disease related symptoms (Choo,

Burke, & Pyo Hong, 2007; Hosseini et al., 2014; Muhammad et al., 2014; Norekvål et al., 2010). Comorbidity was reported to be associated with lower HRQOL (Fortin et al., 2006; Hosseini et al., 2014; Maddigan, Feeny, & Johnson, 2005; Martin et al., 2012; Sundh, Johansson, & Larsson, 2015; van Eck et al., 2008; Xuan et al., 1999). A study showed that higher comorbidity was related with rehospitalization, lower prognosis and longer hospital stay (W. Wang et al., 2014). Patients with comorbidity may experience difficulties in their daily activities that may resulted to depression and fatigue (Vissers et al., 2013). Thus, it is expected that higher comorbidity may related to lower HRQOL.

HRQOL should be conceptualized as integration of not only by biomedical aspects but also dimensions of functioning (Wilson & Cleary, 1995). Therefore, the aim of the present study is to test the role of psychosocial and disease related factors in Indonesian post MI patient's HRQOL. By using SEM in the analysis, one can analyse interrelation among latent constructs and observable variables simultaneously (Schreiber et al., 2006). To the best of our knowledge, a study that include disease related and psychosocial factors that contribute to Indonesian MI patients' HRQOL has never been conducted. The present research proposes five predictors of MI patient's HRQOL. Anxiety and comorbidity are expected to have negative relationship with HRQOL. LVEF is hypothesized to have a positive relationship with HRQOL. Marital satisfaction and religious coping are predicted to be significant moderators in the relationship between anxiety and HRQOL.

Method

Study design and participants

The study was conducted using cross sectional design among patients diagnosed with myocardial infarction from National Heart Hospital in Jakarta, Indonesia. We approached the participants after they finished their regular health check-up. Participants who were eligible and signed the informed consent completed four questionnaires (see below). The researcher helped participants who were having difficulties completing the questionnaires. Hospital and University of Indonesia released ethical approval. The study was conducted from November 2016 to June 2017. More than 90% of total participants need assistance to

fill out the questionnaire independently, thus the researcher and assistant researchersread out the items to the patients.

Demographic and clinical characteristics of the patients can be seen in Table 1. Participants of the study consisted of 18 female patients and 141 male patients with age range from 45 – 71 years of age. 21, 3% of the respondents have primary education level, 33,9% of total number of respondents have middle education level and 44,6% of the respondents have higher education level. 44,5% of the participants were also diagnosed with diabetes mellitus.

Table 1.
Demographic and Clinical Characteristic (N=214) of Myocardial Infarction Patients at time of the survey

Variable	*n*	%
Age (years)		
41-45	15	9.4
46-50	16	10.1
51-55	49	30.8
56-60	31	19.5
61-65	39	24.5
66-70	8	5.0
>70	1	0.6
Sex		
Male	141	88.7
Female	18	11.3
Educational Level		
Primary	34	21.3
High School	54	33.9
College	71	44.6
Comorbidity		
Chronic Kidney Disease	3	1.9
Chronic Obstructive Pulmonary Disease	3	1.4
Cerebrovascular Disease	3	1.9

Variable	n	%
Chronic Liver Disease	3	1.9
Diabetes Mellitus	66	41.5
Congestive Heart Failure	83	38.8

Measures

The present study used four questionnaires. Those questionnaires were translated and back translated into Bahasa Indonesia by independent bilingual translators. The translation was assessed and corrected with help from a panel of experts.

The HRQOL was assessed by using MacNew Heart Disease HRQOL Instrument that consisted of 27 items with 7 answering options from 1 (all of the time) to 7 (none of the time). This questionnaire measures three domains of HRQOL: physical, psychological, and social wellbeing. Global total score and each domain obtained from mean score of answered question. The higher the score means higher HRQOL (Dixon, Lim, & Oldridge, 2002). The internal consistency of this scale for the present study sample was 0.905.

Cardiac anxiety was measured by Cardiac anxiety Questionnaire (CAQ). CAQ is a Likert type scale consisted of 18 items with 5 answering option, from 0 (never) to 4 (always). Score for total and subscale obtained from mean score. Factor analytic study revealed three sub scales namely fear regarding heart disease, escaping behaviour and attention focused (Eifert et al., 2000). CAQ is a valid and reliable instrument and proven to be different from general cardiac anxiety measurement(Van Beek et al., 2012). In this study the Cronbach α = 0.808 for the overall measure.

Marital satisfaction was measured with the Couples Satisfaction Index (CSI)(Funk & Rogge, 2007) which consists of 16 items in semantic differential type of questionnaire with answering option from 0– 5 and 6 items are in Likert type with 6 answering option from 0

(not at all true) to 5 (completely true). The internal consistency for CSI in this sample was 0.941.

Left ventricular ejection fraction (LVEF) is the overall measure for cardiac function (DeSilva, 2013). The score for LVEF was gathered from patient's echo cardiograph report. The score of LFEV is in percentage. The normal LFEV for adult patients is between 55-70% and LVEF less than 35% would be a sign for congestive heart failure (CHF) (Staniute et al., 2015). For the study, the score of LVEF will be categorized into moderate to severe (≤ 40%) and normal to mild (> 40%).

Comorbidity was measured by using Charlson Comorbidity Index (CCI) by summing up the number of comorbidities of the patients. The CCI is a measurement that calculate patient's comorbidity level by using weighted factors based on disease severity. The CCI is commonly used to measure patients' comorbidity (Charlson, Pompei, Ales, & MacKenzie, 1987; H.-Y. Wang, Chew, Kung, Chung, & Lee, 2007). The more comorbid condition, the higher the CCI score. CCI score was categorized into no comorbidity (score = 0), moderate comorbidity (score: 1-2), severe comorbidity (score ≥ 3) (Charlson et al., 1987).

Religious coping behaviour scale was developed by the authors. The instrument consists of four dimensions namely belief, meaning making, problem solving and religious practice. The total number of items used in the study was 39 items with 6 answering option from not agree (1) to agree (6). The score of patient religious coping behaviour was derived from summing up respondent's answer. Higher score in religious coping scale indicates the more uses of religious coping behaviour. The internal consistency (Alpha Cronbach) for the instrument in this study was 0.781.

Statistical Analysis

Descriptive statistics was used to give overall picture of respondents' demographic and clinical characteristics. Before structural equation modelling (SEM) were carried out, Pearson correlation was conducted to explore association and multicollinearity between variables. Descriptive statistics and bivariate correlations were conducted by using IBM SPSS

Statistics 20 and Structural equation modelling was by using MPlus 7 program. In the SEM, the primary model included four latent variables namely: marital satisfaction (satisfaction to one's marital relationship), religious coping behaviour (belief, meaning making, problem solving, religious practice), HRQOL (physical limitation, social functioning, psychological functioning) and cardiac anxiety (fear, escaping behaviour, attention focused). Two observed variables included were comorbidity (CCI) and severity of heart disease (LVEF). Gender, socioeconomic status and educational level were not counted in the primary model because of the non-correlation with HRQOL as shown in Table 2.

Moderating effects were computed as interaction between variables and have similar approach as in regression. The main effect variables are mean-centered and entered together with the computed product and all are regarded as predictors (Iacobucci, 2010). The goodness of fit indicators for acceptable model were: Root Mean Square Error of Approximation (RMSEA) <0.07, The Comparative Fit Index (CFI) <0.9 and Tucker-Lewis Index (TLI) >0.9 (Iacobucci, 2010; Kline, 2011)

Results

As can be seen from Table 2, MI patients tend to have moderately high health related quality of life. Mean level of cardiac anxiety was moderate, however mean level of safety was moderately high. The descriptive results also showed that mean of marital satisfaction were moderate while the mean level of religious coping behaviour was moderately high.

Table 3 shows the results of bivariate correlations. There are several variables significantly correlate with HRQOL: cardiac anxiety, religious coping and marital satisfaction. LVEF is negatively correlated with comorbidity. Marital satisfaction is positively correlated with religious coping and HRQOL.

Table 2.
Descriptive Statistics

Variables	Dimension	Mean	SD	Range
Health-related quality of life (HRQOL)	Total	4.94	0.82	1-7
	Physical limitation	4.81	1.07	1-7
	Emotional Function	5.23	0.83	1-7
	Social Function	4.71	0.97	1-7
Cardiac anxiety	Total	1.84	0.57	0-4
	Fear	1.54	0.89	0-4
	Avoidance	2.33	0.66	0-4
	Attention	1.17	0.85	0-4
	Safety	2.62	0.89	0-4
Marital	Marital satisfaction	3.55	0.62	0-5
Religious coping behaviour	Religious coping Total	4.78	0.40	1-6
	Meaning making	4.56	0.59	1-6
	Problem focused	4.65	0.73	1-6
	Religious practice	4.51	0.73	1-6
	Religious belief	5.40	0.36	1-6

Table 3.
Correlations between variables

	1	2	3	4	5	6
1. Comorbidity	-					
2. Cardiac anxiety	0.047	-				
3. Religious Coping	0.103	0.004	-			
4. HRQOL	0.067	0,594**	0,326**	-		
5. Left ventricular ejection fraction	-0.220**	-0.022	-0,043	0,095	-	
6. Marital satisfaction	0.081	-0.043	0,410**	0,303**	0,022	-

* $P< 0.05$; ** $P< 0.01$

Structural equation modelling used to test proposed model for MI patient's HRQOL. Variables included the proposed model were: i.e. HRQOL as dependent variable and psychosocial factors (i.e. religious coping behaviour, marital satisfaction, cardiac anxiety) and disease factors (comorbidity and LVEF) is relatively fit model, showed by the goodness of fit: RMSEA=0.064, CFI = 0.906 and TLI = 0.884. Figure 2 shows one direct effect of HRQOL predictors: cardiac anxiety was significantly associated with HRQOL. The direction of coefficient showed negative association (standardized coefficient =-0.836). Marital satisfaction was related positively with HRQOL (standardized coefficient =0.251). Marital satisfaction does not only have direct effect on HRQOL but also has moderation effect on relationship between anxiety and HRQOL (standardized coefficient = -0.212)

Figure 2. Structural model of Indonesian MI patient's HRQOL (non significant paths are not shown).

Discussion

This study aims to test psychosocial and disease related factors as predictors of Indonesian post MI patient's HRQOL. Structural equation modelling (SEM) analysis found a significant role of cardiac anxiety, as independent predictors in determining MI patient's HRQOL. Marital satisfaction also contributed to moderated effects of cardiac anxiety to HRQOL.

The first finding is that higher cardiac anxiety was correlated with lower patient's HRQOL. After cardiac event, patients experienced many disease related symptoms. Patients with cardiac anxiety tend to pay attention more to the physical change: for instance high sympathetic activities, inflammation and higher blood pressure (Watkins et al., 2013), and then considered those symptoms as a sign of worsen heart condition. This attention to physical changes might induce inactivity in patients also difficulties in adhering to disease treatment. Thus, this mechanism may lead to lower HRQOL. Result of this study is in line with result from other studies (Blakemore et al., 2014; Hosseini et al., 2014; Kepka et al., 2013).

Marital satisfaction also found contributed to the HRQOL score in MI patients. Marital satisfaction has various effect on patient's health outcome (Slatcher, 2010). Marital satisfaction is characterised by positive emotions resulted from spousal interaction such as problem solving or communication (Robles et al., 2014). Thus, patients with low marital satisfaction tend to have negative emotional response which may be followed by higher disease related symptoms that can lower HRQOL. Not only lowering HRQOL, negative emotional response also hinders patients to adhere to disease treatment and lifestyle changing. Low adherence to disease treatment might result in more severe health status (Proulx & Snyder-Rivas, 2013; Robles et al., 2014; Slatcher, 2010). Results of the study also showed that marital satisfaction moderated effects of anxiety to HRQOL. Higher marital satisfaction can act as buffer on the relationship between anxiety and HRQOL. During stressful time after MI, marital satisfaction can help patients to easily adjust to many changes and difficulties such as anxiety and lifestyle changes. Robles et.al (2014) concluded that marital satisfaction can have buffering effect to health. High marital satisfaction may ensure social support for patients which can mitigate effects of stress. Result of the study was in line with previous studies (Bookwala, 2011; K, Stapleton, & Turrisi, 2008).

Religious coping behaviour was not significantly act as moderator between anxiety and HRQOL. There were two possible explanation for this result. First, Indonesian people is known for its religiosity that relies on religion to understand the world (Sallquist et al., 2010). Therefore, use of religious coping to handle difficult events in life is a common

behaviour for Indonesian people. High mean scores of religious coping behaviour shows that the respondents often use religious coping behaviour (M = 4,78, SD = 0,40). Second, one study concluded that the level of one's religiosity remain stable especially during late adulthood despite of negative events or elevated stress level (Krause & Van Tran, 1989). Since more than 50% of the respondents were in late adulthood, therefore their regular use of religious coping was not increase or decrease because of the challenges caused by MI.

The present study did not find direct relationship between LVEF and comorbidity with HRQOL. HRQOL is consisted of three dimensions, namely physical limitation, emotional functioning and social functioning. Therefore, HRQOL is not only measuring physical aspects but also patient's assessment regarding the impact of the disease to their emotional condition and ability to be related to others. Pearson product moment analysis in this study revealed significant relationship between LVEF and emotional function in HRQOL, thus patient's physical function is more related to HRQOL's psychological aspects. A meta analytic study supported the argument that patient put more emphasis on psychological functioning compare to physical function when assessing their HRQOL(Smith et al., 1999). The present study used Charlson Comorbidity Index to measure comorbidity. Although Charlson Comorbidity Index already include many chronic diseases, however several debilitating diseases are not included such as depression back pain and arthritis. It was reported that type of comorbidity that have significant relationship with HRQOL are arthritis, back pain and depression (Xuan et al., 1999).

This study succeeded in shed more light into the importance of patient's immediate environment factors in predicting patients HRQOL. Results of the study can serve as an important information for hospital and health care provider to pay more attention to psychological function and patient's immediate environment. Intervention should focus on enhancing marital interaction between patient and spouse such as communication style training, so patients may feel understood and supported. Post MI patients need supports form their surroundings to adjust to the changed physical condition.

In addition, medical professional should be more sensitive to patient's anxiety symptoms following cardiac events, thus focusing on patient's emotional state after hospitalization and give intervention to lower cardiac anxiety especially for patients with high level of cardiac anxiety would be beneficial for increasing post MI patient's HRQOL.

The present study has several limitations. First, respondents of the study are dominated with male respondents, thus it is difficult for generalization for female population. Future study that includes more female respondents should give more information regarding HRQOL in post MI patients.

Second, most of the participants were helped by the researchers during completion of the questionnaires. This could introduce biases in the results, such as social desirability and interviewer effect. Therefore, incorporating other type of data gathering should limit the biases found in the study.

Since the present research found important role of marital satisfaction on patients HRQOL, thus it is suggested that future research might include negative affect. Prospective study with shorter interval (days, weeks, moths) is more beneficial to infer about marital satisfaction on patients HRQOL(Robles et al., 2014).

Conclusion

The study concluded that cardiac anxiety as an independent predictor of MI patients HRQOL. Higher cardiac anxiety contributed to lower HRQOL in MI patients. However, the effects of cardiac anxiety to HRQOL could be buffered with marital satisfaction. Thus, higher marital satisfaction could attenuate detrimental effects of cardiac anxiety to HRQOL.

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