

## Correlation between Six-Minutes' Walk Test and Quality of Life in Heart Failure Patients

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### Abstract

**Background:** The problem of heart failure patient relates with reduced functional capacity and eventually leads to declined quality of life (QoL). Improved QoL may not relate to better functional capacity since QoL is influenced by patient's expectation to the on-going treatment. This study was conducted to investigate the correlation between six-minutes' walk test (6MWT) as a measure for functional capacity and QoL of heart failure patient in Dr. Hasan Sadikin General Hospital.

**Methods:** This cross sectional study involved 32 patients who were on planned visit at the outpatient clinic of Dr. Hasan Sadikin General Hospital Bandung from September to October 2013. Subjects were chosen using consecutive sampling. The correlation of 6MWT and QoL assessed using modified Minnesota Living and Heart Failure Questionnaire (MLHFQ) was analyzed through Pearson's correlation test.

**Results:** There was a significant correlation between distance covered in 6MWT and QoL ( $r=-0.354$ ,  $p<0.05$ ). The mean of six-minute walk distance was 277.96 ( $\pm 42.17$ ) and mean of QoL score was 33.41 ( $\pm 7.88$ ). In accordance with the findings in previous studies, this study revealed correlation between the distance obtained in 6MWT and the QoL score in heart failure patient.

**Conclusions:** There is correlation between 6MWT and quality of life in outpatients with heart failure at Dr. Hasan Sadikin General Hospital. [AMJ.2015;2(4):469-73]

**Keywords:** Heart failure, quality of life, six-minutes' walk test

### Introduction

Heart failure incidence is reported to be increasing not only due to aging, but also due to successful current therapies of cardiac disorder patients with prolong survival.<sup>1,2</sup> Assessment of quality of life (QOL) in patients with heart failure is important to evaluate health influences in holistic aspects; including physical, emotional and social function. This can be made as consideration for doctor to give individual therapy.<sup>3</sup> Clinical symptoms in the patients, which limit their activities in daily living, impair their QOL.<sup>4</sup> QOL impairment in the patient may be due to psychological problems, adverse effect of treatment, social limitation, and socio-economic problems.<sup>3,5</sup> Considering those factors, QOL may be irrelevant with functional capacity. The clinical symptoms are also associated with their

functional capacity which can be assessed sub maximally through six-minutes' walk test (6MWT).<sup>5,6</sup>

Several studies have been conducted to investigate the correlation between 6MWT and QOL.<sup>7,8</sup> Previous studies demonstrate significant correlation between the two variables (6MWT and QOL).<sup>7,8</sup> In addition to that, this study is conducted to investigate the correlation between 6MWT and QOL in patients with heart failure in Dr. Hasan Sadikin General Hospital Bandung. This study might be the first study discussing this issue in Dr. Hasan Sadikin General Hospital. Nevertheless, the result of this study may be different compared with the previous studies since the quality of life is influenced by patient's expectation towards the treatment outcomes. In addition, differences in ethnicity is known to be associated with different QOL in distinct

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populations.<sup>9</sup>

## Methods

An analytical cross sectional study was conducted from September to October 2013 using primary data of the patients who were on planned visit at outpatient the clinic of Dr. Hasan Sadikin General Hospital. A total of 32 subjects were determined by calculating minimum sample size. Consecutive sampling technique was used as the sampling method. Inclusion criteria included patients with stable chronic HF with New York Heart Association (NYHA) functional class II and III, aged at least 18 years old, and were able to understand Indonesian language. Subjects were excluded if the patients were found to have unstable angina or myocardial infarction during last one month, pulse during rest higher than 120 bpm, systolic pressure higher than 180 mmHg, and diastolic pressure higher than 100 mmHg. Other than that, the excluded patients were also those with physical limitation due to other factors besides heart failure, e.g; musculoskeletal problems and pulmonary

disease, mental illness that may hinder patients from answering questionnaire, stroke in last two months, anemia, infection, and incomplete data of questionnaire. Prior to that, the subjects involved in this study were given information and signed consent approved by Ethical Committee of the institution.

The QOL was evaluated using specific instrument, namely modified Minnesota Living with Heart Failure Questionnaire (MLHFQ), which had been translated into Indonesian language. The MLHFQ has comprehensive questions that measures the most relevant domain of QOL related to heart failure, including physical and emotional domains.<sup>5,10</sup> However, question about sexual activity was investigated as not valid by Kaawoan.<sup>11</sup> The MLHFQ used in this study was considered as modified MLHFQ consisting of 20 questions with 1–4 scale. The total score would be in the range of 20–80, where 80 indicated the poorest QOL.

Functional capacity was evaluated by performing 6MWT which has been proved as valid, simple, safe and useful tool.<sup>12</sup> The 6MWT was conducted in 20 m indoor corridor by single

**Table 1 Characteristics of Subjects**

Characteristics	Number of subject (n = 32)	Statistical Analysis (X*)
Age (years)		55.31 (±9.36)
Gender		
Men	13	
Women	19	
Weight (kg)		57.48 (± 10.08)
Height (m)		1.55 (1.47-1.72)
BMI** (kg/m <sup>2</sup> )		23.07 (±4.14)
Occupation		
Housewife	17	
Entrepreneur	7	
Unemployed	5	
Civil servants and pensioner	3	
Functional classification of NYHA#		
II (%)	27	
III (%)	5	
Score of modified MLHFQ##		33.41 (±7.88)
6-minutes' walk distance (m)		277.96 (±42.17)

Note: \*X= all in mean, except for height, \*\*BMI=Body Mass Index, #NYHA= New York Heart Association, ##MLHFQ= Minnesota Living with Heart Failure Questionnaire

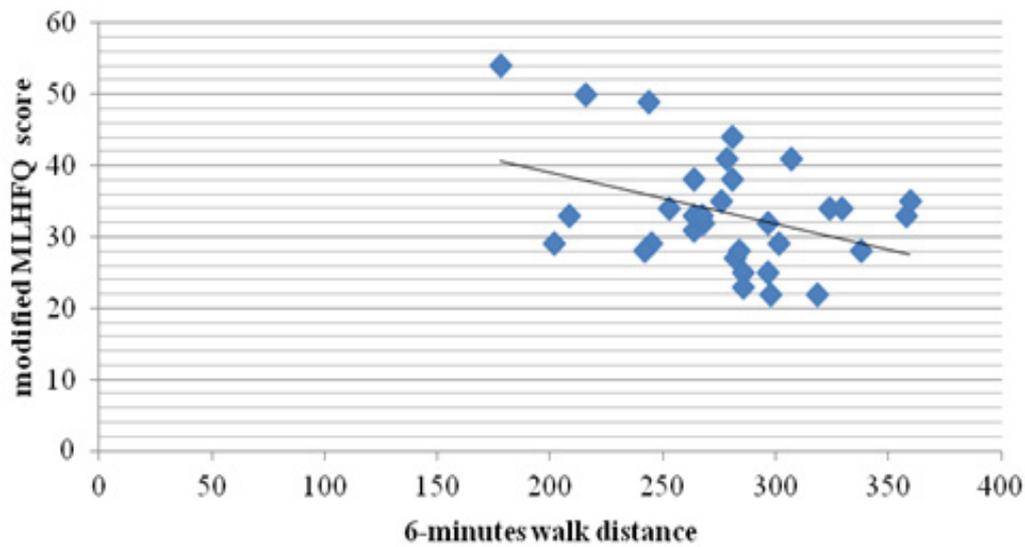


Figure 1 Correlation Between 6-Minutes' Walk Distance and Quality of Life

examiner under supervision. The procedure of the test was performed according to the protocol of American Thoracic Society (ATS). Patients were allowed to self-pace and rest as needed as they traversed back and forth along a marked walkaway. Standardized phrases were used while speaking to the subjects during the tests. At the end, the total distance achieved in six minutes was measured.

Statistical study was analyzed using Statistical Product and Service Solution version 13.0. Saphiro Wilk test was used for determining distribution of data in each variable. If the data were normally distributed, Pearson correlation test was performed to analyze the correlation between the distance of 6MWT and the QOL score. The score of  $P < 0.05$  meant that it was statistically significant.

## Results

The characteristics of subjects, six-minutes' walk distance and modified MLHFQ score, are summarized in Table 1. All subjects successfully accomplished 6MWT. Some subjects stopped for a while in the middle of the test due to mild dyspnea, then continued their walking. There were no severe complaints occurred during or after the tests.

Saphiro Wilk normality test showed that the data of modified MLHFQ score and 6MWT distance were normally distributed. Pearson

correlation test between distance obtained in 6MWT and score of modified MLHFQ revealed weak and significant negative correlation ( $r = -0,354$ ,  $p = 0,047$ ), which meant that 6-minutes' walk distance was inversely correlated to modified MLHFQ score (Figure 1).

## Discussion

Measurement of QOL is considered important to evaluate the influence of disease in patients' life and how the patients confront it.<sup>3</sup> The mean of modified MLHFQ score in this study ( $33.34 \pm 7.88$ ) was lower than the study in Brazil, which suggested better QOL.<sup>7,8</sup> Ethnicity is known to have association with different QOL in distinct populations.<sup>9</sup> Moreover, cross-cultural study between individualism and collectivism showed that country of residence has an overwhelming impact on QOL ( $F_{4,666} = 59.31$ ,  $p < 0.001$ ).<sup>13</sup> Other factors influencing QOL in heart failure patients are NYHA functional classification, personality motivation, gender, and age.<sup>4,14</sup>

The 6MWT is beneficial to observe functional status and predict mortality of the patients with heart failure.<sup>6,15</sup> In this study, the mean of six-minutes' walk distance (6MWD) was 277.96 meters (SD  $\pm 42.17$ ) which was lower than that of the studies in Brazil.<sup>7,8</sup> The difference may be due to several factors such as body height, body weight,

gender, motivation, and previous experience in performing the test.<sup>16</sup> Morbidity, NYHA functional classification, medication, and age also influence the distance in 6MWT.<sup>16</sup>

This study elucidates that there was significant negative correlation between the distance covered in 6MWT and the QOL in HF patient ( $r=-0.354$ ,  $p<0,05$ ). The longer the distance in 6MWT implicates lower modified MLHFQ score, which means better QOL. The correlation may occur since MLHFQ consists of questions measuring the physical ability in HF patient, such as walking and climbing stairs.<sup>10</sup> Declined physical ability lowers the QOL of heart failure patients.<sup>5</sup> In the other hand, 6MWT reflects individual's ability to perform daily activities.<sup>6</sup>

Similar to the previous study, the result of this study showed the correlation between six-minutes walk distance and QOL in heart failure patients.<sup>7,8</sup> Santos et al.<sup>7</sup> showed significant and strong correlation ( $r=-0.62$ ) between 6MWT and QOL measured by MLHFQ in Brazilian samples. However, the study involved man only.<sup>7</sup> Other study conducted by Nogueira et al.<sup>8</sup> in Brazil successfully showed the correlation between the two variables ( $r=-0.5$ ). However, the 6MWT was performed twice in every subject which was different in once in every subjects in this study.<sup>8</sup>

Different length of corridor for the 6MWT between ATS recommendation (30 meters) and this study (20 meters) might be a limitation for this study.<sup>12</sup> Shorter corridor will require patients to take more time to reverse their directions.<sup>12</sup> However, there are no significant effects for the length ranging from 15 to 49.2 meters.<sup>12</sup> Selection of 6MWT location according to ATS is necessary to improve validity.

In conclusion, the 6MWT correlates with quality of life measured by modified MLHFQ. Better exercise tolerance is associated with better QOL of the outpatients with heart failure at Dr. Hasan Sadikin General Hospital.

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