

# The Relationship between Multimorbidity and Quality of Life on Acute Myocardial Infarction Patients Undergoing Percutaneous Coronary Intervention in Haji Adam Malik Hospital Medan

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**Abstract:- Introduction:** Acute Myocardial Infarction (AMI) is one of the spectrums of Acute Coronary Syndrome (ACS) with a high mortality rate. Patients with AMI are often accompanied with comorbid factors that worsen the risk and affect the prognosis so that requires post intervention evaluation. Heart related quality of life proved to be useful in evaluating post intervention and comorbidities management strategies. The Quality of life can be measured using a EuroQoL questionnaire based on the EQ-5D score. This study will determine the relationship between multicorbidities and Quality of Life.

**Method:** This is a cohort retrospective study of AMI patients who underwent Percutaneous Coronary Intervention (PCI) at the HAM Hospital. Data was collected from April 2022 until the sample was fulfilled. Measurements of comorbid were made based on single comorbid and multicorbid . The quality of life was determined based on the EQ-5D index score. Bivariate analysis was conducted to assess the correlation between the two variables. Then, a multivariate analysis was performed to assess comorbidities as a predictor of quality of life.

**Result:** Total subjects were 80 AMI patients consist of 30 (37.5%) patients with Good Quality of Life (EQ-5D index score = 1) and 50 (62.5%) patients with Poor Quality of Life (EQ-5D index score < 1 ). There are 41 (51.3%) single morbid patients and 39 (48.8%) multi comorbid patients, and Hypertension was the most comorbid in this study (62 (77.5%) patients). Based on multivariate analysis, it was found that the strongest relationship to quality of life was comorbidities ( OR = 19.338).

**Conclusion:** Comorbidities have relationship with quality of life where multicorbid can predict impaired quality of life in AMI patients after percutaneous coronary intervention.

**Keywords:-** Acute Myocardial Infarction , Quality of Life, EuroQol Questionnaire, Comorbidity.

## I. INTRODUCTION

In Indonesia, heart disease is still one of the highest causes of death, so that all people need to take a role in preventing the high morbidity and mortality due to this disease. Data from Basic Health Research (RIKESDAS) 2018 shows the prevalence of cardiovascular disease in Indonesia, especially coronary heart disease, tends to stay at 1.5% (2013-2018) (RIKESDAS 2018). According to data for 2013 - 2018, the prevalence of CHD is around 1.5% where the highest incidence is found in women (1.6%) and men (1.3%), at the age of 65-74 years (3.6%) followed by the aged over 75 years (3.2%). In North Sumatra, based on the doctor's diagnosis, CHD was found in 44,698 people (0.5%) while based on clinical and symptoms around 99,336 people (1.1%) (RISKESDAS, 2013).

*Institute for Health Metrics and Evaluation (IHME)* reports that 14.4% of the causes of death in Indonesia are coronary heart disease (CHD), it is reported that 50% of CHD sufferers have the potential to experience sudden cardiac arrest (IHME 2019). Acute Coronary Syndrome (ACS) is a serious cardiovascular problem because it causes high rates of hospitalization and death. Most ACS are acute manifestations of torn or ruptured coronary artery atheromatous plaques. This is related to changes in plaque composition and thinning of the fibrous layer covering the plaque. This event will be followed by the process of platelet aggregation and activation of the coagulation pathway to form a platelet-rich thrombus (white thrombus). This thrombus will clog the coronary arteries, either totally or partially or become microemboli that clog the more distal coronary vessels. In addition, there is a release of vasoactive substances that cause vasoconstriction, thereby exacerbating the disruption of coronary blood flow. Reduced coronary blood flow causes myocardial ischemia . The oxygen supply that stops for about 20 minutes causes the myocardium to experience necrosis (myocardial infarction). Acute Coronary Syndrome is divided into myocardial infarction with ST segment elevation (STEMI), Myocardial Infarction myocardium with non ST segment elevation (NSTEMI-ACS), and unstable angina pectoris (UAP) ( Rhee et al , 2011; PERKI, 2018).

Multimorbidity is the condition of having two or more long-term illnesses in an individual, which is one of the main challenges in public health. About 70% of patients with cardiovascular disease have at least one condition that affects their long-term health. Co-morbidities or co-morbidities are often found in hospitalized patients, especially infarct patients myocardial where this condition is significantly associated with quality of life and even death at follow-up up long-term. Post- infarction patient myocardial infarction is often reported with quality of life (*Heart-Related Quality of life - HRQoL*) is poor and independently associated with a higher mortality rate at 1-year post-infarction (Munyyombwe et al , 2021).

Several previous studies have described long-term health conditions and their impact on quality of life in individuals after acute myocardial infarction . Poor HRQoL is more frequently reported in women, older, non-white races and in individuals who develop bleeding complications on dual antiplatelet administration. Post-infarction in patient Acute myocardial infarction with chronic health conditions such as hypertension, diabetes, angina, depression, and chronic obstructive pulmonary disease (COPD) are reported to have a poor HRQoL . In addition, certain combinations of diseases may have a greater effect on functional status, physical and mental status, quality of life and even death ( Lewis et al , 2014).

To assess the outcome of medical interventions on adjusted quality of life in long-term life years, a quality of life instrument that describes the patient's health status using community preferences is needed. One of the instruments that can be used is the *EuroQualityofLife -5 Dimension (EQ - 5D) instrument* (Mandy et al al , 2021).

*EuroQoL - 5 Dimension ( EQ - 5D )* is one of the instruments that is often used to assess the quality of life in patients with cardiovascular disease. This instrument collects descriptively quality of life data and also known as *heart-related quality of life ( HRQoL )* in five dimensions followed by a self-assessment covering overall health status in the form of a visual analogue scale (EQ-VAS). This instrument is easy to use so that it can be applied to post-infarction patients acute myocardial infarction to assess short- and long-term quality of life ( Fredrick et al , 2017).

## II. METHODS

### A. STUDY DESIGN

This research is an analytic descriptive with cohort retrospective design to evaluate connection among multimorbidity and quality of life in acute myocardial infarction patients. Multimorbidity is calculated based on the number of co-morbidities an individual has, while quality of life is assessed from score Euro QoL (EQ-5D) after the patient undergoing Percutaneous Coronary Intervention (PCI). Acute myocardial infarction patients (AMI) who were treated and underwent Percutaneous Coronary Intervention (PCI) at Haji Adam Malik General Hospital Medan as of 6 months since the intervention. The time of the research was carried out from April 2022 until the sample was filled.

### B. STUDY POPULATION

Population target on this study is patient with AMI which under go Percutaneous Coronary Intervention. Temporary population affordable is patient with IMA undergoing Percutaneous Coronary Intervention at H. Adam Malik Hospital Medan. Sample is affordable population that meets the criteria inclusion. Sample on study this collected with use consecutive sampling technique.

### C. INCLUSION CRITERIA

Acute Myocardial Infarction patients who have complete Percutaneous Coronary Intervention revascularization during treatment at Haji Adam Malik Hospital or revascularization of culprit lesions (non-complete revascularization) in multivessel with non-culprit lesions  $\leq 70\%$  and patients who are willing to complete the EuroQoL questionnaire (EQ - 5D & EQ - VAS)

### D. EXCLUSION CRITERIA

Patient with congenital heart disease, patient with heart valve disease, Patient with cardiomyopathy, Patient with atrioventricular conduction disease, patients with history disease cerebrovascular with impaired mobility, patient with terminal disease (*terminal stage of any illness*), patient with record data medical that is not complete , patient who h are not willing to participate in the study.

### E. ETHICS IN RESEARCH

This research will apply for approval from the Health Ethics Committee from the Faculty of Medicine, University of North Sumatra and a research permit from Haji Adam Malik Hospital in Medan.

### F. MULTIMORBIDITAS AND QUALITY OF LIFE

Every individual which becomes sample in this study must made *informed consent* letter that is required signed by the participants and researcher. Upon admission to the emergency room (IGD), an ECG assessment was performed using the Bionet Cardiotouch 3000 tool at a rate of 25 mm/s and an amplitude scale of 10 mV/mm. AMI was diagnosed base on wave on ECG and the elevation of cardiac troponin.

All patient will grouped based on number of co-morbidities and will classified based on 7 diseases chronic disease used in the *Myocardial Ischaemia National Audit Project (MINAP) registry* that is Hypertension , Diabetes Mellitus , Asthma / COPD , Chronic Heart failure, Chronic Kidney Failure, Cerebrovascular Disease, and Priphealvascular disease. On this research we excluded patient with disease cerebrovascular because this condition could cause bias especially on the components questionnaire EuroQoL (EQ-5D).

Evaluation quality of live (*Heart - Related Quality of Life*) with instrument calculation score EuroQoL (EQ-5D) with fill in questionnaire. Data collected through questionnaire which is condition 6 month patient after discharge from hospital. This instrument consists of the 2 subscales that is descriptive system (EQ-5D-3L) with range score - 0.5 to 1 and visual analog scale (EQ-VAS) with range score 0 to 100.

### III. STATISTICAL ANALYSIS

Processing and analysis data statistics using the SPSS application. Categorical variables are presented in frequency (n) and percentage (%). Numeric variables served in average score (means) and standard deviation (SD) for data which normally distributed. Meanwhile, for data that is not normally distributed, the Numerical variable values are presented with the median and interquartile ranges. Normality test of numerical variables on all research subjects using the Kolmogorov-Smirnov test with  $n > 50$  or Shapiro Wilk test if  $n < 50$ .

Bivariate analysis using Chi - square test for categorical data or Fisher 's test if the Chi - square test conditions not fulfilled. Bivariate analysis for data numeric with test T -independent if data normally distributed and Mann Whitney test for data which not normally distributed. The value  $< 0.05$  was said to be statistically significant.

Multivariate analysis was performed on variables that had a p value  $< 0.25$  or variables which by theoretical important and will be carried out using logistic regression.

### IV. RESULT

#### A. CHARACTERISTICS STUDY

This research was conducted at the Department of Cardiology and Vascular Medicine, Haji Adam Malik Hospital from April 2022 to July 2022 by collecting samples through direct interviews and via telephone to complete the questionnaire and also by looking at the medical records of AMI patients who underwent percutaneous coronary intervention. The study involved 80 AMI patients who meet the inclusion criteria and exclusion criteria of the included study.

From the total number of samples involved in the study, data was collected from the clinical condition of the patients at admission, laboratory findings, electrocardiography and coronary angiography.

#### B. BASELINE CHARACTERISTICS

The number of subjects in this study were 80 people, consisting of 63 men (78.8%) and 17 women (21.3%) with an average age of  $56.10 \pm 9.96$  years. Data that is normally distributed is presented in the form of an average with a standard deviation, while data that is not normally distributed is presented in the form of a median with a minimum and maximum value.

Based on the history of disease (comorbidity) owned by the study subjects, history of hypertension was the most common risk factor 62 ( 77.5 %) subjects, followed by chronic heart failure 32 (40.0%) subjects and lastly was a history of diabetes mellitus and obesity respectively 23 (28.8%) subjects each, with multiple comorbid 39 (48.8%) subjects and single comorbid 41 (51.3%) subjects. Based on the body mass index (BMI) parameters of the study subjects, the median BMI was 25.39 (19.10 – 44.92) kg/m. History of smoking was found in 62 (77.5%) subjects (Table 1).

Characteristics	Score
Sex	
Male	63 (78.8%)
Female	17 (21.3%)
Age (years)	56.10 ±9.96
Body mass index	25.39 (19.10 – 44.92)
History of Smoking/Smoking	62 (77.5%)
Electrocardiographic Parameters	
STEMI	54 (67.5%)
NSTEMI	26 (32.5%)
Echocardiographic Parameters	
LV EF (%)	48 (20 – 64)
LAVi (ml/m <sup>2</sup> )	25.0 (12.0 – 57.7)
TAPSE(mm)	19 (10 – 25)
Disease History	
Hypertension	62 (77.5%)
Diabetes mellitus	23 (28.8%)
Peripheral Vascular Disease	1 (1.3%)
Chronic Heart Failure	32 (40.0%)
Chronic Renal Failure	8 (10.0%)
COPD/ Asthma	2 (2.5%)
Obesity	23 (28.8%)
Coronary Angiography	
Single vessel	58 (72.5%)
Multi vessel	22 (27.5%)
Drugs	
Aspirin	80 (100%)
Clopidogrel / Ticagrelor	80 (100%)
ACE-I/ ARB	70 (87.5%)
Beta Blockers	65 (81.3%)
Statins	80 (100%)
Comorbidity	
Single Comorbid	41 (51.3%)
Multiple Comorbid	39 (48.8%)
<i>EuroQualityQuestionnaire of Life (EQ-5D)</i>	
Mobility	61 (76.3%)
Self Care	65 (81.3%)
Daily activities	43 (53.8%)
Pain / Discomfort	24 (30.0%)
Anxiety/Depression	26 (32.5%)
EQ-5D score index	0.848 (0.000 – 1.000)
VAS scores	90 (50 – 100)
<i>Heart Related Quality of Life</i>	
Good Quality of Life	30 (37.5%)
Poor Quality of Life	50 (62.5%)

Table 1: Basic Characteristics of Research Subjects

Electrocardiographic parameters at the time of admission showed STEMI as many as 54 people (67.5%) while NSTEMI 26 people (32.5%). In Echocardiographic parameters the median left ventricular ejection fraction was 48 (20 – 64) %, the median left atrial volume index was 25.0 (12.0 – 57.7) ml/m, and the median right ventricular TAPSE was 19 (10 – 25) mm. From the results of coronary angiography, there were 58 (72.5%) subjects with single coronary lesions and the remaining 22 (27.5%) subjects with multiple coronary lesions (Table 2).

Assessment results quality of life in Table 1 show each section from component quality life that is mobility, self care, daily activity, pain/ discomfort, and anxiety/depression. The most problems found that is ability for to do activity everyday, then followed with disturbance ability walking, selfcare, anxiety, and pain/discomfort. Average index score from fifth component the is 0.848 with a median VAS score of 90 (50-100). Questionnaire in Indonesian is used for collection of assessment data quality life has been tested with results reliable and valid against Indonesian residents. Estimation duration questionnaire data collection on each respondent is 10-15 minutes.

**V. BIVARIATE ANALYSIS OF SUBJECT CHARACTERISTIC ON QUALITY LIFE (HEART RELATED QUALITY OF LIFE)**

Analysis bivariate by T-Independent Test, Mann-Whitney Test, Chi-Square Test, and Fisher's Test conducted for knowing is there is connection or meaningful difference among characteristics subject study based on Quality of Life (HRQoL). Poor Quality of Life found as many as 50

(62.5%) subjects and Good Quality of Life in 30 (37.5%) subjects (Table 2).

In Bivariate analysis, it was found that there were statistically significant differences in characteristics (  $p < 0.05$ ) in several parameters such as left ventricular ejection fraction, hypertension, DM, CHF, vessels disease, and comorbidities (Table 2).

Characteristics	good Quality of Life N = 30 (37.5%)	Poor Quality of Life N = 50 (62.5%)	<i>p -value</i>
Sex			
Male	26 (41.3%)	37 (58.7%)	0.290 <sup>1</sup>
Female	4 (23.5%)	13 (76.5%)	
Age (years)	49.57 ±9.37	59.78 ±9.36	0.236 <sup>3</sup>
Body mass index	24.90 (19.10 – 29.76)	26.59 (20.20 – 44.92)	0.239 <sup>4</sup>
Smoking/Smoking History	26 (41.9%)	36 (58.1%)	0.213 <sup>1</sup>
ECG parameters			
IMA EST	21 (38.9%)	33 (61.1%)	0.902 <sup>1</sup>
IMA NEST	9 (34.6%)	17 (65.4%)	
ECHO parameters			
LV EF (%)	51.67 ±5.76	44.56 ±8.78	< 0.001 <sup>3</sup>
LAVi (ml/m <sup>2</sup> )	24.05 (12.2 – 36.3)	28.1 (12.0 – 57.7)	0.128 <sup>4</sup>
TAPSE(mm)	19 (17 – 25)	18 (10 – 24)	0.976 <sup>4</sup>
Disease History			
Hypertension	19 (30.6%)	43 (69.4%)	0.038 <sup>1</sup>
Diabetes mellitus	2 (8.7%)	21 (91.3%)	0.002 <sup>1</sup>
Peripheral VD	0 (0.0%)	1 (100%)	> 0.999 <sup>1</sup>
Chronic Heart Failure	4 (12.5%)	28 (87.5%)	< 0.001 <sup>1</sup>
Chronic Renal Failure	1 (12.5%)	7 (87.5%)	0.250 <sup>2</sup>
COPD/ Asthma	0 (0.0%)	2 (100%)	0.525 <sup>1</sup>
Obesity	7 (30.4%)	16 (69.6%)	0.566 <sup>1</sup>
Coronary Angiography			
Single vessel	26 (44.8%)	32 (55.2%)	0.052 <sup>1</sup>
Multi vessel	4 (18.2%)	18 (81.8%)	
Drugs			
ACE-I/ARB	24 (34.3%)	46 (65.7%)	0.164 <sup>2</sup>
Beta Blockers	24 (36.9%)	41 (63.1%)	> 0.999 <sup>1</sup>
Comorbidities			
Single morbid	29 (70.7%)	12 (29.3%)	< 0.001 <sup>1</sup>
Multimorbid	1 (2.6%)	38 (97.4%)	

Table 2: Bivariate Analysis of Subject Characteristics on Quality of Life

<sup>1</sup> Chi-Square    <sup>2</sup> Fisher Exact    <sup>3</sup> T-independents    <sup>4</sup> Mann-Whitney

**VI. MULTIVARIATE ANALYSIS OF LOGISTICS REGRESSION SUBJECT CHARACTERISTICS ON QUALITY OF LIFE**

Furthermore, multivariate analysis was performed using logistic regression analysis with variables categorical dichotomous with a predictive concept framework to assess the strength of the relationship of the variables that influence the quality of life. Variables included in the logistic regression analysis were variables that in the bivariate analysis had a  $p$  value  $< 0.25$ . The variables are smoking/smoking history, vessel disease, history of hypertension, history of diabetes mellitus, history of CHF, comorbidities, left ventricular ejection fraction, and left atrial volume index. The strength of the relationship can be

seen from the value of OR ( ExpB ). From the analysis, it was obtained that the greatest correlation strength was Comorbidity (OR = 19.338) and the smallest association strength was smoking (OR = 0.669) (Table 3).



	Coefficient	SE	Wald	df	Score	OR	95% CI	
							Min	Max
<b>Smoking / History Smoke</b>	-0.402	1.006	0.160	1	0.689	0.669	0.093	4,801
<b>Vessel Disease</b>	0.720	0.919	0.614	1	0.433	2055	0.339	12,447
<b>HT history</b>	1,212	1036	1,370	1	0.242	3,361	0.442	25,578
<b>DM history</b>	1.118	1,535	0.530	1	0.467	3,058	0.151	61,921
<b>CHF history</b>	2024	1013	3,994	1	0.046	7,570	1040	55,116
<b>Comorbidity</b>	<b>2,965</b>	<b>1,496</b>	<b>3,925</b>	<b>1</b>	<b>0.048</b>	<b>19,388</b>	<b>1,032</b>	<b>364,184</b>
<b>EF group</b>	-0.132	1615	0.007	1	0.935	0.877	0.037	20,766
<b>Group LAVi</b>	2,259	1,670	1829	1	0.176	9,574	0.362	252,921
<b>Constant</b>	-2.108	1,405	2,253	1	0.133	0.121		

Table 3: Multivariate Analysis of Logistic Regression Characteristics of Research Subjects on Quality of Life

**VII. IMPACT OF COMORBIDITY WITH EACH OF THE EQ-5D 'S COMPONENTS**

For evaluate impact of morbiditywith each component evaluation quality of life that consists from mobility, self care, daily activity, pain , and anxiet /depression (Table 4 to Table 8). From the results analysis obtained p value < 0.05 of fifth component that's what it means found difference significant among subject with single comorbidity and subject with multiple comorbidity.

Comorbidity	<u>Mobility</u>		P-value	RR with 95% CI
	Disturbed Frequency %	Capable Frequency %		
Multicomorbid	17 43.6	22 56.4	< 0.001	17.87(2.49-127.96)
Single comorbid	1 2.4	40 97.6		0.57 (0.43 – 0.76)

Table 4: Impact of comorbidity in Mobility

Comorbidity	<u>Self care</u>		P-value	RR with 95% CI
	Disturbed Frequency %	Capable Frequency %		
Multicomorbid	13 33.3	26 66.7	0.003	6.83(1.64 – 28.34)
Single comorbid	2 4.9	39 95.1		0.70 (0.55 – 0.88)

Table 5: Impact of comorbidity in Self Care

Comorbidity	<u>Daily Activities</u>		P-value	RR with 95% CI
	Disturbed Frequency %	Capable Frequency %		
Multicomorbid	30 76.9	9 23.1	< 0.001	4.50 (2.24 – 2.49)
Single comorbid	7 17.1	34 82.9		0.27 (0.15 – 0.50)

Table 6: Impact of comorbidity in Daily Activity

Comorbidity	<u>Chest pain (Pain)</u>		P-value	RR with 95% CI
	Disturbed Frequency %	Capable Frequency %		
Multicomorbid	22 56.4	17 43.6	< 0.001	11.56(2.91 – 45.94)
Single comorbid	2 4.9	39 95.1		0.45 (0.31 – 0.65)

Table 7: Impact of comorbidity in Pain

Comorbidity	<u>Anxiety / Depression</u>		P-value	RR with 95% CI
	Disturbed Frequency %	Capable Frequency %		
Multicomorbid	20 51.3	19 48.7	0.001	3.50 (1.57 – 7.80)
Single comorbid	6 14.6	35 85.4		0.57 (0.40 – 0.80)

Table 8: Impact of comorbidity in Anxiety/ Depression

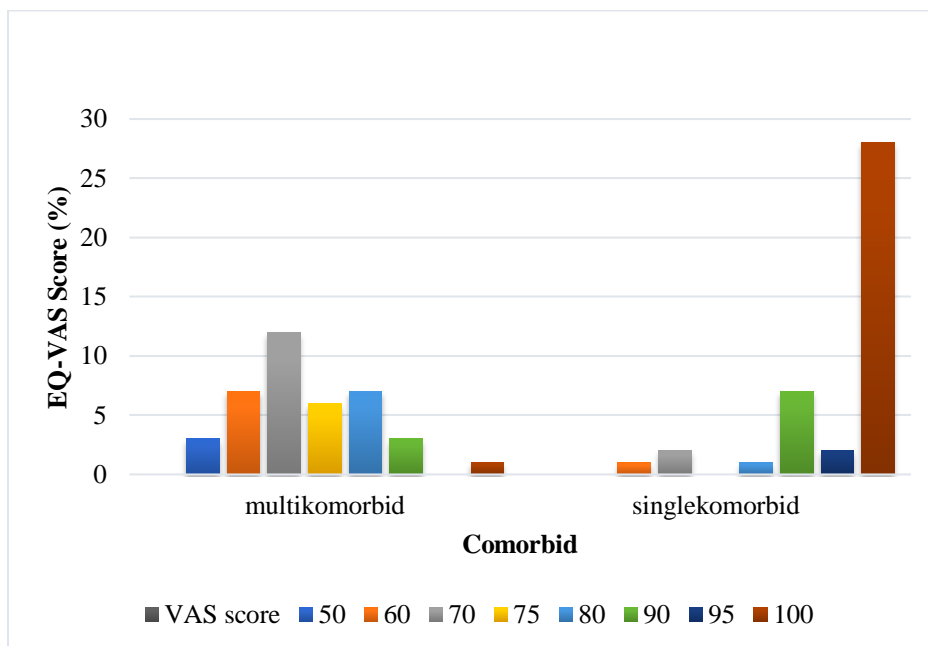


Fig. 1: GraphicImpact of Morbidity with the EQ-VAS score.

Based on analysis, it is known that the patient with multiple comorbid have probability 17.87 times experiencing disturbance in *mobility* compared with patient with single comorbid with RR 17.87 (95% CI 2.49 – 127.96). Likewise with *self care* with RR 6.83 (95% CI 1.64 – 28.34), daily activity impaired with RR 4.50 (95% CI 2.24 – 2.49) , pain with RR 11.56 (95% CI 2.91 – 45.94), anxiety / depression with RR 3.50 (95% CI 1.57 – 7.80). Relationship chart comorbid with EQ-VAS scores show that subject with multi comorbid tend to have lower score compared with single comorbid ( Table 4 to Table 8).

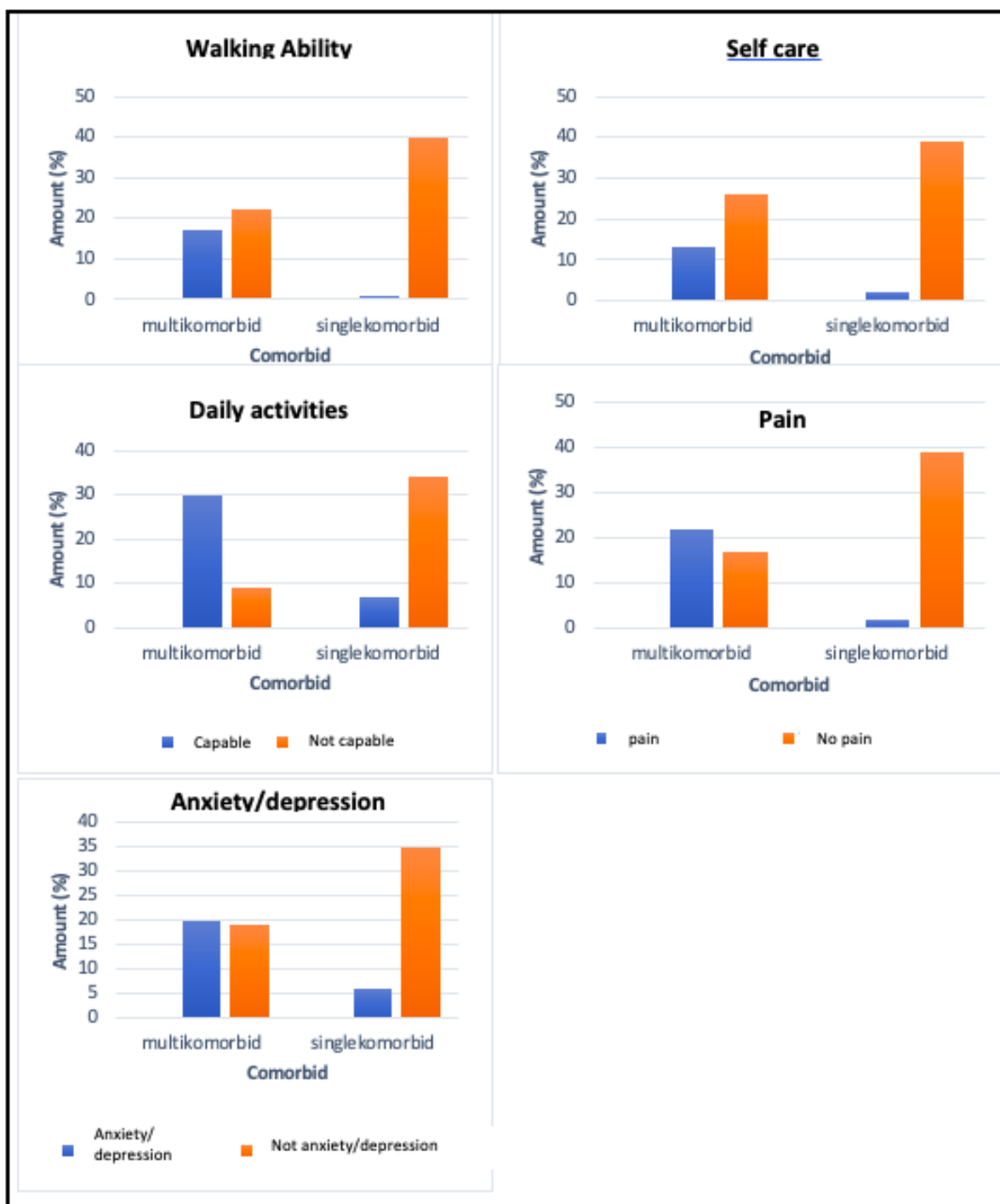


Fig. 2: Total patient based on level quality of life(component EQ – 5D : mobility, self care, daily activity, pain, and anxiety/depression) in single comorbid and multikomorbid population.

**VIII. DISCUSSION**

This study is a cohort retrospective study of patients with AMI at the Haji Adam Malik General Hospital Medan which was conducted from April 2022 to July 2022. This study aims to determine the relationship between comorbidities and quality of life ( *Heart Related Quality of Life* ) AMI patients who underwent percutaneous coronary intervention. Quality of life/ HRQoL is measured based on the EuroQoL score obtained from a questionnaire so that the relationship between comorbidities and quality of life in these patients can be identified.

On research this obtained information that there is connection among multimorbidity with quality life AMI patients who have conducted percutaneous coronary intervention. On multivariate analysis obtained comorbidity factor have the greatest strength relationship in predict poor quality of life compared other factors (OR 19.338 95% CI: 1.032 – 364.184). this is in line with previously study by Munyombwe (2021) obtained same result where severe multimorbidity tend cause decline quality of life in AMI patients (OR 3.43 95% CI: 2.11 – 4.75). Endalewstudy (2021) shows that multimorbidity relate with pain level in the patients Coronary heart disease . With thereby based on



study and is supported by research before, comorbidity factor significantly influence quality of life in AMI patients .

AMI patient that has undergo revascularization need evaluated condition in short term period and long term, especially in patients with comorbidity. Assessment of quality of life post intervention was important to evaluate the success of interventions and drugs medication. Questionnaire is one enough instrument that easy applied and proven could evaluate quality life post AMI patients post intervention in various study in short-term and long-term period research. Information about quality life have role important in management clinical patient cardiovascular especially with multiple comorbidities, where this population often experience burden related disease and need management more complex disease ( Endalew H *et al* , 2021).

Based on characteristics subject research, mean age subject study is 56 years . this is different with average age studies previously conducted by Munyombwe (2021) , namely 64 years and research by Pocock *et al* (2020) with average 65 years old. For cardiovascular risk factor comorbidity, disease history of Hypertension is the most risk factor 77.5%, followed by Chronic Heart Failure 40.0% and last is history of Diabetes Mellitus and Obesity each 28.8%, with history smoke as much as 77.5%. this is tend higher from studies previously by Munyombwe (2021) where as hypertension 42.6%, diabetes mellitus 17.9%, and 65.3% smokers . On this research, amount of multicorbid 48.8% and single comorbid 51.3%. Based on the subject 's body mass index (BMI) parameter study , the median BMI was 25.39 (19.10 – 44.92) kg/m while in previously research the average BMI was 28.7 kg/m<sup>2</sup> . With thus, seen that Indonesian patients have more average age young from European patients and have more life expectancy than Caucasians race in England. This can be associated with amount risk factor of coronary haeartare more common in Asian race compared to race Caucasian .

Gender type in this research dominated by male sex with proportion 78.8%. Other studies also show that male more suffer from AMI compared to female ( Munyombwe *et al* , 2021). this is show that man have a higher risk factor for occurrence of AMI.

The Questionnaire EuroQoL ( EuroQuality of Life) EQ-5D Score Index obtained in research show more median low in multimorbidity group 0.717 (0.030 – 1000) compared with single morbidity group (1,000). The difference obtained by statistics ( $p < 0.001$ ). this is in line with previously study by Munyombwe (2021) where average index score patient with severe multimorbid lower ( $0.6 \pm 0.3$ ) compared to with single comorbid ( $0.82 \pm 0.24$ ) and support this study that multimorbidity will influence quality of life AMI patients even though there is difference intervention in election revascularization in the study this compared with study before. On this research obtained difference meaningful VAS (visual analog scale) values in patients multicorbid with a median score of 73.90 (50-95), where this score was lower than single comorbid population with a median score of 99.49 (95-100) with  $p$  value  $< 0.001$ . this is in line with

previously study by Endalew *et al* (2021) where multi comorbid population have average VAS scores was poor ( $59.92 \pm 20.79$ ) compared with single comorbid population ( $76.39 \pm 17.22$ ).

This research also carried out to each component of the EQ – 5D in questionnaire EuroQoL that is mobility , self care , daily activity , pain , and anxiety / depression. In multimorbidity groups found probability mobility disturbance increase of 17.87 times compared with single comorbid group (RR 17.87 95% CI;  $p$  value  $< 0.001$ ), as well as ability selfcare disturbed (RR 6.83 CI 95%;  $p$  value 0.003), daily activity disturbed (RR 4.50 CI 95%;  $p$  value 0.001), pain (RR 11.56 CI 05%;  $p$  value  $< 0.001$ ), and anxiety / depression (RR 3.50 CI 95%;  $p$  value 0.001). The same thing was also obtained in previously study by Munyombwe (2021) who stated that group severe multimorbidity tend have disturbance ability walk compared with the mild multimorbidity group (OR 9.62 95% CI: 6.44 – 14.36), ability nurse self (OR 7.87 Ci 95%: 4.78 – 12.97), daily activities (OR 2.41 95% CI: 1.79 – 3.26), pain (OR 2.04 95% CI; 1.50 – 2.77), anxiety / depression (OR 1.97 95% CI: 1.42 – 2.74).

Based on previously analysis bivariate is known that factor risk smoking, coronary lesion (vessel disease), hypertension , DM, CHF, comorbid classification , fraction ejection ventricle left , and left atrial volume index influence quality life AMI patients ( $p$  value  $< 0.05$ ).

## IX. CONCLUSION

This study include 80 survivor of hospitalised MI found that comorbidity has a relationship with quality of life based on the number of comorbidities in which populations with multimorbidity are likely to result poor quality of life. Comorbidity factors significantly affect each component of the EQ-5D (ability to walk, ability to care for oneself, daily activities, pain, anxiety/depression). Amount of subjects in research consisting of 63 men (78.8%) and 17 women (21.3%) with an average age of  $56.10 \pm 9.96$  years, with the classification of comorbidities in this study namely multicorbid 48.8% and single comorbid 51.3%. The comorbidities found in this study included a history of hypertension as the most common comorbid factor ( 77.5 %) followed by chronic heart failure (40.0%) and a history of diabetes mellitus and obesity respectively (28.8%) each. The median EQ-5D Score Index of the EuroQoL questionnaire in this study was 0.848 (0.0 – 1.0), the median VAS score was 90 (50 – 100), with a final assessment of good quality of life of 37.5% and quality life disturbed 62.5%. Smoking, coronary lesions, history of hypertension, history of diabetes mellitus, history of CHF, and left ventricular ejection fraction significantly affect quality of life.

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