Factors Associated Quality of Life of Patients with Heart Stents in Dr Sardjito General Hospital Yogyakarta

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Abstrak

Penyakit jantung koroner merupakan penyebab kematian pertama di dunia dan merupakan 31% penyebab kematian diseluruh dunia. Pemasangan stent menyebabkan angka mortalitas akibat PJK turun dan terbukti meningkatkan kualitas hidup serta menurunkan frekuensi angina. Di sisi lain pasien dengan penyakit jantung koroner yang terpasang stent jantung mempunyai resiko kesehatan yang bermacam-macam terkait komplikasi dan faktor kesehatan lainya sehingga akan mempengaruhi kualitas hidupnya. Penelitian ini bertujuan untuk mengetahui faktor-faktor yang berhubungan dengan kualitas hidup pasien dengan stent jantung di Poli Jantung RSUP Dr Sardjito Yogyakarta. Penelitian ini merupakan penelitian crossectional dengan melibatkan 94 sampel pasien jantung koroner yang terpasang stent jantung yang melakukan kontrol di poli Jantung di RSUP Dr Sardjito Yogyakarta. Kualitas hidup diukur menggunakan seattle angina questionaire dan depresi diukur menggunakan skala BDI II (beck depression inventory). Analisa data menggunakan analisa multivariat menggunakan regresi linier. Faktor usia merupakan satu-satunfaktor yang signifikan berhubungan dengan kualitas hidup pasien dengan stent jantung dengan p=0,001 (p<0,05) dengan nilai R:-0,366. Usia merupakan faktor yang berhubungan dengan kualitas hidup pasien dengan stent jantung.

Kata Kunci: *kualitas hidup; stent jantung; penyakit jantung koroner*

Abstract

Coronary heart disease is the highest cause of death in the world and constitutes 31% of causes of death worldwide. Installation of the stent causes mortality rate due to CHD to decline and has proven to improve the quality of life and reduce the frequency of angina. On the other hand, patients with coronary heart disease with heart stents have various health risks related to complications and other health factors that will affect their quality of life. This study aims to determine the factors associated with the quality of life of patients with heart stents in the Cardiovascular Polyclinic of Dr. Sardjito General Hospital Yogyakarta. This study is a cross-sectional study involving 94 samples of coronary heart patients with heart stents having a checkup on the Cardiovascular Polyclinic at Dr. Sardjito General Hospital, Yogyakarta. Quality of life was measured using Seattle Angina Questionaire and depression was measured using the BDI II scale (beck depression inventory). Data were analyzed using multivariate analysis with linear regression. The age factor is a significant factor related to the quality of life of patients with heart stents with p = 0.001 (p <0.05) with R: -0,366. Age is a factor associated with the quality of life of patients with heart stents.

Keywords: *quality of life; heart stents; coronary heart disease*

INTRODUCTION

Coronary heart disease is a disease due to the narrowing of the coronary arteries or the occurrence of *atherosclerosis* in the coronary arteries that causes *endothelial* damage and causes a series of acute coronary syndromes (1). Coronary heart disease is the leading cause of death in the world. WHO classifies coronary heart disease into the category of *cardiovascular disease* (CVD) wherein 2015 17.7 million people or around 31% was the cause of death worldwide (2). Advances in cardiology technology in the management of coronary heart disease are developing rapidly. Death due to heart disease in the past decade reported to have decreased from 400 deaths to half in every 100,000 people due to interventional cardiology such as myocardial revascularization (3). Revascularization is an action to restore the function of coronary arteries due to a blockage with the PCI method (*percutaneous coronary intervention*) or a surgical method called CABG (*coronary angiography bypass grafting*). Heart stent is a small tube-shaped prosthesis device inserted on the coronary arteries to keep the lumen and maintain the blood supply that is inserted through the process of *balloon angioplasty*(4). Cardiac stents are attached to a cardiology intervention called PCI (*percutaneous coronary intervention*) using a contrast agent called coronary angiography. The stent is inserted through the femoral artery into the coronary arteries with a heart catheter.

Currently, in Indonesia, 2 types of stents are commonly used, namely DES (*drug-eluting stents*) and BMS (*bare-metal stents*). BMS (*bare metal stent*) is a stent without a polymer layer while DES (*drug-eluting stent*) is a development of BMS which is a stent coated with a polymer and certain drugs to reduce the incidence of *in-stent restenosis* or repeated constriction due to stenting. Installation of stents in the coronary arteries is currently the most widely performed medical procedure. Installation of stents in the coronary arteries was done in 84.2% of the PCI procedures (5). In the USA more than 70% of PCI interventions are carried out by placing one or more stents in the coronary arteries (6). In Indonesia, the installation of stents in the coronary arteries is common in hospitals that have cath-lab facilities. In Dr. Sardjito General Hospital, the number of interventional cardiology treatments is stated to have increased from 2008-2012 and the most performed one is the PCI procedure (7). Official documents about the use of stents in Indonesia are still rarely found(8). The impact of coronary heart disease on patients' quality of life is disrupted quality of life and shortening one's life expectancy (9). That is because coronary heart disease hurts the physical and psychosocial functions of the patient. Stenting is a recommended interventional cardiology for patients with coronary heart disease, but patients still face the risk of complications such as an inflammatory response from stenting in blood vessels such as narrowing blood vessels (*in-stent restenosis)*, thrombosis and the body's natural response itself (4). After the PCI procedure, the patient receives *double antiplatelet therapy* which is a therapy to prevent the occurrence of "*in-stent restenosis*" for one year which is at risk of bleeding and decreased quality of life of the patient (10). Therefore the quality of life of patients with heart stents needs to be re-evaluated.

Quality of life is influenced by many factors. Factors that affect the quality of life include; biological function, *symptoms*, functional status,

general health perception, environmental characteristics and individual characteristics of (11). Another opinion is that factors that affect the quality of life-related to health include multidimensional factors such as physical, social and psychological related to illness and therapy (12). While the factors that affect the quality of life in coronary heart patients include age, anxiety, depression and coping mechanisms and the factors most related to the quality of life are age, income, and depression (13) . While clinical factors that affect the quality of life of patients with heart stents include the *length of stay* (LOS), type of stent, number of mental stents, symptoms of anxiety and depression that persist so that it affects the quality of life of patients and disease prognosis (13). The patient's quality of life is a variable to evaluate the success of a therapy and measure the patient's health status. Measuring health-related quality of life has been recommended by America's largest heart disease organization or the *American Heart Association* (AHA) (14). Quality of life is the main goal of treatment given to patients with coronary heart disease (15).

Stenting is proven to improve the quality of life of patients with coronary heart disease. In Cockburn's study (2013) (16)in general, PCI procedures in the elderly provide improved quality of life and reduce the frequency of angina. Some studies on the effects of *coronary intervention* on quality of life claim that *coronary intervention* (PCI and CABG) is associated with improving quality of life moderately but is significantly better than usual treatment (17). The purpose of this study is to determine the factors associated with the quality of life of patients with cardiac stents at Cardiovascular Polyclinic in Dr. Sardjito General Hospital Yogyakarta.

MATERIALS AND METHODS

This study is a *cross-sectional* study with multivariate linear regression analysis with a sample of 94 patients with heart stents in Cardiovascular Polyclinic at Dr. Sardjito General Hospital, Yogyakarta. This research took place on December 20, 2018 until February 5, 2019 at the Cardiology Center of Dr. Sardjito General Hospital, Yogyakarta. The sample in this study amounted to 94 patients with heart stents and was having a checkup at the Cardiovascular Polyclinic of Dr. Sardjito General Hospital Yogyakarta with the criteria for having a heart stent, able to read and write, age> 18 years old and had signed *informed consent*. Samples were excluded when they could not continue the research process because of their health conditions. Data were taken using a disease-specific instrument for assessing the health status of patients with coronary artery disease, namely SAQ (*Seattle Angina Questionnaire*). This instrument is an instrument with 5 measurement domains which are physical limitations, angina stability, angina frequency, treatment satisfaction, and disease perception. This questionnaire is an English-language questionnaire and has been translated into Indonesian, modified and tested for validity and reliability and its valid and reliable to be used (18). The validity of the p-value of all sub-variables < 0.05 and could be concluded that this questionnaire is valid to be used.

The second instrument is a BDI instrument used to determine depression factors. The BDI questionnaire is a questionnaire to measure depression variables. The questionnaire used in this study is the Indonesian version of BDI II questionnaire which has been tested for validity and reliability by Ginting (2013) and has been used in Saputra's research (2017) with *Cronbach alpha* 0.80–0.90. The Indonesian version of the BDI II Questionnaire consists of 21 questions in which patients are asked to choose 1 out of 4 statements about their most suitable feeling condition. Statistical analysis uses multivariate analysis with linear regression to determine factors related to the quality of life of patients with cardiac

stents. The data in this study have a non-normal distribution data so the statistical analysis used is non-parametric, namely the *Spearman* test for factors with a numerical scale. As for factors with a nominal scale of analysis used are *mann-Whitney* and *Kruskal Wallis.* This research has received ethical approval from *The Medical and Health Research Ethics Committee (MIREC)* Faculty of Medicine, Public Health and Nursing UGM No. KE/FK/1110/EC/2018, Dr. Sardjito General Hospital Yogyakarta (LB.02.01 / X1.2.2 / 26851/2018).

RESULTS AND DISCUSSION
Result
Description of respondent characteristics

This study used 94 samples, with the largest was from 56-64 years age group with 43 correspondents (45, 7%), males 79 correspondents (8,2%), married correspondents with a higher education level 41 people (743.2%) and private employees 59 people (62.76%). Most respondents had several clogged heart arteries as much as 1 VD (*vessel disease*) who had 1 stent and DES type. A comorbid disease that mostly appeared was 1 with hypertension as the most common disease.

Quality of life of patients with cardiac stents.

Quality of life of patients with cardiac stents at the Cardiovascular Polyclinic of Dr. Sardjito Hospital Yogyakarta. Quality of life of patients with cardiac stents in Cardiovascular Polyclinic of Dr. Sardjito General Hospital based on SAQ questionnaire (*Seattle angina questionnaire*) is in the good category with 78,7% or 74 patients.

Factors Related To The Quality Of Life Of Patients With Heart Stents

Factors included in the linear regression analysis are factors that have significance <

Table 1. Overview of the Medical Characteristics of Patients with Heart Stents in Cardiovascular Polyclinic Dr. Sardjito General Hospital Yogyakarta in 2019. (n = 94)

Medical characteristic variable	N	(%)
Clogged vessels		
1 VD	32	34
2 VD	31	33
3 VD	31	33
Number of Stents		
Single stent (1)	63	67
Double stents (2)	23	24.5
Multi stents (> 2)	8	8.5
Stent type		
DES	82	87.2
BMS	12	12.8
Number of Comorbid Diseases		
0	4	4.3
1	46	48.8
2	40	42.6
3	4	4.3
List of Comorbid Diseases		
None	4	4.2
DM	1	1.1
CHF, HT	4	4.2
DM, HT	33	35.1
DM, HT, CRF	4	4.2
Gout, HT	1	1.1
HT	45	47.9
HT, COPD	1	1.1
RA, HT	1	1.1
Depression		
Normal	71	75.4
Mild mood disorder	6	6.4
Borderline	1	1.1
Mild depression	15	16
Severe depression	1	1.1

Source: Primary Data 2019

0,25 so that the factors that meet the requirements are age, marital status, number of blocked vessels, number of comorbidities followed by linear regression analysis and the following is the result of linear regression analysis:

From the results of the regression analysis, it was found that age is the only factor that has a significance of $p < 0.05$ so that it can be interpreted that age is a factor that is significantly related to the quality of life of patients with heart stents at Dr. Sardjito General Hospital Yogyakarta. From the analysis results, R^2 *adjusted* was also obtained, i.e. the correlation coefficient between

Table 2. Overview of the Quality of Life Patient with Cardiac Stent in Cardiovascular Polyclinic in RSUP Dr. Sardjito Yogyakarta in 2019 (n: 94)

Domain SAQ		f (%)
Physical limitation Angina stability	Minimal	50(53,2%)
	Mild	44(46,8%)
	Moderate	0
	Severe	0
	Much Better	44(46,8%)
	Slightly better	31(33%)
	Unchanged	19(20,2%)
	Slightly worse	0
	Much worse	0
Angina frecuency	Minimal	50(53,2%)
	Mild	11(11,7%)
	Moderate	33(35,1%)
	Severe	0
Treatment satisfaction	Completely satisfied	73(77,7%)
	Mostly satisfied	21(22,3%)
	Not satisfied	0
Disease Perception	Excellent	69(73,4%)
	Good	20(21,3%)
	Fair	59(5,3%)
	Poor	0
Kualitas Hidup Total	Excellent	74(78,7%)
	Good	20(21,3%)
	Fair	0
	Poor	0

Source: Primary Data 2019

the data generated by the regression model obtaining a value of 0.134 or 13.4% with weak relationship strength and test of *ANOVA* showed sig <0.05 in all four models that researchers use, so the regression equation model is feasible to use. Value *adjusted* R by 13, 4 % would mean that in this model to explain the variable quality of life (Y) of 13.4% which 76,6% related to the variable quality of life outside of this equation.

The results of the regression coefficient found that age has a value of -0.386 which can be interpreted that each increase of 1 in the x variable (Age) will contribute to the Y variable (quality of life) of 0.366 in the opposite direction. The lower the ag, the better the quality of life of patients with heart stents. From the results of regression analysis, the constant value in the equation is 97.89 and the age variable regression coefficient is -0.386 so that if a formula is used to determine prediction using the formula $Y = a + bx$ then the resulting regression equation is $Y = 97.89 + 0.366$ (Age). This equation is used to forecast the quality of life of patients with cardiac stents.

Discussion

The quality of life of patients with cardiac stents in the Cardiovascular Polyclinic is in the very good category. This is consistent with research conducted by (15) that patients with coronary heart disease have the advantage of a PCI procedure (*stenting*) that is the faster recovery time and improved quality of life at 1 month after the intervention. In Fen's study (2018) it is also explained that the quality of life score in the PCI group (*stenting*) is greater than that of drug treatment in the dimensions of *angina stability* and *angina frequency* at measurements 6 months after the intervention. Cardiac revascularization of PCI is also said to have a positive impact on the quality of life of patients with coronary heart disease compared with drug therapy although it is not significantly different compared to CABG(17).

Table 3. Factors related to the quality of life of patients with heart stents in Cardiovascular Polyclinic Dr. Sardjito Hospital Yogyakarta (n = 94).

Variable	Unstandardized B	Standardized B	t	Value of p	95% CI Lower	95% CI Upper
(Constant)	97,959					
Age	-0,307	-0,366	- 3.77	.001	-469	-146
Adjusted R.	0.125					
R (correlation coefficient)	.366					
R²(coefficientofdetermination)	.134					

Source: Primary Data 2019

Good conditions are also shown from the results of the categories in each domain of SAQ quality of life. It can be seen that in each domain the quality of life of patients is not in the heavy category and the majority is in the best category. This is consistent with the results of the study that the stenting procedure is statistically proven to be effective in improving the quality of life of coronary heart patients with stable angina at measurements of 6 to 12 months, quality of life improved from 5% before stenting to 68% at one-year evaluation (19). After the coronary intervention, physical function is a strong factor for the quality of life 1 year after PCI(9). Another opinion was also expressed by Bliley & Ferrans (1993) that the perception of the quality of life of patients is in line with satisfaction with function and health status, especially in aspects of symptoms such as reduced frequency of chest pain, increased tolerance for physical activity.

In this study, from the 9 factors measured, it was found that age is the only significant factor related to the quality of life of patients with cardiac stents at the Cardiovascular Polyclinic of Dr. Sardjito General Hospital Yogyakarta. The same results were obtained in the study of Darvishpour (2017) that after going through multivariate analysis, the age variable is one of the important variables related to the quality of life of patients in addition to the number of comorbidities and the number of vessel diseases, after going through *angioplasty* or PCI procedures. Similar research results were also stated by (20) that after going through multivariate analysis it was stated that age is the strongest sign that is a factor influencing subjective health status (quality of life) at 10 years after performing PCI procedures.

Characteristics of respondents it is known that most of the samples in this study were patients with an age range of 56-64 years old. The age group is the target of the procedure for intervention in the PCI procedure which is at the age of 50-65 years old because many assumptions are stating bad results for patients >65(21). Classification at the age of ≥65 years claims that patients > 65 years have mortality rate, bleeding, and recurring strokes after undergoing PCI procedures but with stenting, the clinical outcome in patients increases (22).

Age is also a considered factor in determining the consideration of interventions in the process of interventional cardiology, this is because age can affect the physiology of the stent. The big difference is in the prognosis in the age group > 65 years old compared to younger < 65 years old. Patients > 65 years old who have heart stents attached also have a higher health risk compared to the <65 years old age group in the form of acute coronary syndromes and bleeding which occur more often than the < 65 years old group associated with anti-thrombus therapy (Kaehler, 2006). However, many studies state that stent placement at age > 65 years old is an effective intervention, because the condition of blood vessels in elderly patients is not in prime conditions compared to that in the age group of < 65 years old so > 65 years old patients have more cardiovascular complaints that this intervention is considered to be very effective in groups of > 65 years old (21).

In elderly patients > 65 years old the occurrence of In-hospital mortality is also higher compared to younger age groups of < 65 years old, in some studies > 65 years of age is associated with short-term prognosis and high rates of complications, elderly patients are also weaker and the level of cardiac disease is more complex, there are also multiple comorbid and coronary calcifications which increase morbidity and mortality rates after performing PCI and stenting procedures (23).

In elderly patients> 65 years old, age makes a difference in the clinical outcome but this is not the only factor to determine clinical decisions, management of various coronary syndromes that arise after performing PCI procedures

including weaknesses, the accuracy of treatment, awareness, drug interactions, complications, and revascularization easiness. PCI procedures do have risks in elderly patients but competence and modern techniques of coronary revascularization can provide the expected clinical *outcome* (16).

Besides, the elderly patients were shown to have decreased physical limitations compared with younger post PCI patients with a value of p=0,0016 (24). Elderly patients who have undergone PCI procedures have increased physical function at 6 and 8 months compared to conservative treatment (drugs) which are only seen in the elderly group and do not occur in younger age groups that are influenced by independent factors namely the age variable and previous historical revascularization variables(25). In Yeng's study (2016), it is argued that age is an important factor for determining relationships in other aspects such as healing after stenting procedures (PCI).

The results of this study state that age is the most dominant factor affecting the quality of life of patients with cardiac stents and the majority of elderly patients are the most vulnerable and benefited populations in this procedure. This study implies that the most dominant factor influencing the quality of life of patients with heart stents in Cardiovascular Polyclinic in Dr. Sardjito General Hospital Yogyakarta is the age in which this factor is a variable that cannot be controlled through medical intervention, so it is necessary to note to health workers that evaluating the quality of life of patients with heart stents needs to be done periodically at a health facility to measure the success of a stenting therapy and also assess the development of individual health status in more depth.

CONCLUSION AND RECOMMENDATION

The conclusion of this study is the quality of life of patients with heart stents at the Cardiovascular Polyclinic Dr. Sardjito Yogyakarta Hospital is in the very good category and age is a factor related to the quality of life of patients with heart stents and that patients with a younger age will have a better quality of life.

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