

# Quality of Life in Hemodialysis Patients with Diabetes Mellitus

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**Abstract**— *Background: Hemodialysis is renal replacement therapy most preferred by patients with ESRD. In addition to the most preferred, hemodialysis is a therapy that most influences on quality of life. One thing that influences quality of life in hemodialysis patients is comorbidity. Diabetes mellitus is one comorbid with high prevalence in hemodialysis patients. Objectives: The objective of this research is to determine correlation between comorbidity of diabetes mellitus and quality of life in hemodialysis patients. Methods: Prospective cohort research with samples as many as 79 patients in Hemodialysis Unit of PKU Muhammadiyah Yogyakarta Hospital from March to May 2016. Quality of life in hemodialysis patients were assessed using questionnaire of WHOQoL-BREF. Results: The results showed that the comorbid of diabetes mellitus influenced towards quality of life in hemodialysis patients, patients without comorbid of diabetes mellitus had good quality of life 4.2 times than patients with comorbid of diabetes mellitus. Conclusions: Comorbidity of diabetes mellitus influences quality of life in hemodialysis patients.*

**Keywords**— Enter key words or phrases in alphabetical order, separated by colon.

## I. INTRODUCTION

Chronic Kidney Disease (CKD) is progressive impairment of renal function, irreversible and it causes metabolic imbalances and fluid and electrolytes in the body, which causes uremia [1]. CKD consists of several stages, where the final stage of CKD is called End Stage Renal Disease (ESRD). ESRD is known that kidneys are not able to maintain body homeostasis [2] with the value of the glomerular filtration rate less than 15 mL/minute/1.73 m<sup>2</sup> [3]

Patients with ESRD should immediately get renal replacement therapy to survive [4]. Renal replacement therapy can be either transplantation or dialysis, which consists of peritoneal dialysis and hemodialysis. More patients with ESRD choose hemodialysis therapy currently and the numbers keep increasing from year to year. Data from United States Renal Data System (USRDS) mentions that in United States more than 65% of patients with ESRD run hemodialysis therapy [1] In Indonesia in 2009, there were 5.450 patients with kidney failure who run hemodialysis. These conditions keep increasing and it happens in 2010, the number of patients with kidney failure who run hemodialysis as many as 8.034 patients and in 2011 as many as 12.084 patients [5].

Hemodialysis is renal replacement therapy done 2-3 times a week with duration of 4-5 hours, which aims to remove residual of protein metabolism and correcting fluid and electrolyte balance disorder [6,2]. Despite running hemodialysis but not all uremic toxins can be removed from

the body. This condition can worse influence on the body and bring wide range of comorbid. Comorbidity is defined as the occurrence of conditions/diseases other than ESRD [7].

Comorbidity is a factor that affects quality of life in hemodialysis patients [8]. World Health Organization (WHO) defines quality of life is individual's perception of their position in life in the context of culture and values in their neighborhood and in relation to goals, expectations, standards and concerns. WHO has WHOQoL-BREF instrument to measure quality of life. This instrument has four domains about quality of life, including physical, psychological, social, and environmental [9].

The prevalence of comorbid is high to patients who carry out hemodialysis, among others Atherosclerosis Cardiovascular Disease (ACVD), Congestive Heart Failure (CHF), hypertension, diabetes mellitus (DM), and cognitive disorders, which comorbid is one risk factor for mortality [10]. A research is conducted by Pakpour, A., et al., [11] shows that 66% of 250 hemodialysis patients have comorbid. The wide variety of comorbid would add to symptoms experienced by patients, and will have an impact on hospital visits, Length of Stay (LOS), the cost of hospitalization, and mortality [12].

Complications of DM will make the patient's condition is getting worse and will influence quality of life to patients [13]. Sorensen, et al., [14] stated that quality of life in hemodialysis patients with DM get worse when compared with patients who carry out hemodialysis without DM. A research, conducted in Poland, it shows that physical health scores on quality of life in hemodialysis patients with DM is lower when compared with hemodialysis patients without DM [15]. The objective of this research is to determine correlation between comorbidity of diabetes mellitus and quality of life in hemodialysis patients in Hemodialysis Unit of PKU Muhammadiyah Yogyakarta Hospital.

## II. METHOD

This research method is prospective cohort design. The risk factors studied were comorbidity of hemodialysis patients. Quality of life was measured after 2 months later. This research was conducted in Hemodialysis Unit of PKU Muhammadiyah Yogyakarta Hospital

### A. Subject

The population was all patients who carry out hemodialysis in Hemodialysis Unit of PKU Muhammadiyah Yogyakarta Hospital. The inclusion criteria were age over 18 years; hemodialysis patients who have routinely last 3 months;

patients who have comorbid; patients were able to communicate with Indonesian; patients were willing to become respondents. Exclusion criteria consisted of patients who have surgery three months earlier; patients with psychiatric disorders; patients with loss of consciousness; hearing disorders; patients who have malignant disease, tumor. The samples were 79 patients using consecutive sampling method.

**B. Material and Procedure**

Data were collected using questionnaire which consisted of respondent characteristics, and quality of life. Quality of life questionnaire used WHOQoL-BREF which consists of 26 questions. The questionnaire of WHOQOL-BREF has been tested validity and reliability previously by Nurcahayarti (2011) with results of validity (0.798) and reliability (0.941). Data of comorbidity were collected by looking at the patient's medical record [16].

**C. Ethicall Consideration**

The researcher has obtained research ethics statements from the research ethics committee of the Faculty of Medicine and Health Sciences of Muhammadiyah University, Yogyakarta.

**D. Statistical Analysis**

Univarian analysis was performed on each variable of research, this analysis described frequency distribution and percentage on each variable of research. Determining correlation between independent and dependent variables used Chi-square test, using 95% of confidence level. If the value of  $p < 0.05$ , results of statistical calculation was significant, then calculated with odds ratio (OR), OR value is estimated risk of influencing outcome as independent variables.

**III. RESULT**

TABLE I. Distribution of Respondent Characteristics in Hemodialysis Unit

Variable	Category	N	%
Age (years)	< 40 years	22	27.8
	≥ 40 years	57	72.2
Gender	Male	49	62
	Female	30	38
Education	Low	21	26.6
	High	58	73.4
Occupation Status	Not work	49	62
	Work	30	38
Marital status	Not married	12	15.2
	Married	67	84.8
Dialysis Duration	New	32	40.5
	Old	47	59.5

Patients aged ≥ 40 years as many as 57 respondents (72.2%). Males were 49 respondents (62%) and female were 30 respondents (38%). Most education level of respondents was higher education as many as 58 respondents (73.4%). 49 respondents (62%) did not work. Majority of respondents were married as many as 67 respondents (84.8%). Majority of respondents had old run hemodialysis as many as 47 respondents (59.5%).

TABLE II. Correlation between comorbid of DM and Quality of Life to Hemodialysis Patients in Hemodialysis Unit

Variable	Category	Quality of Life		p*	OR (95% C.I)
		Good	Bad		
Comorbid DM	No	13	7	0.006	4.230 (1.447-12.370)
	Yes	18	41		

The results showed that there was correlation between comorbid of DM and quality of life. Patients without comorbid of DM had good quality of life for more than patients with comorbid of DM. Patients without comorbid of DM is likely to have good quality of life 4.230 times than patients with comorbid of DM.

**IV. DISCUSSION**

DM is a cause of ESRD and comorbid patients with ESRD. Approximately 20-30% of patients with DM type 1 will occur microalbuminuria after diabetic over 15 years and less than most will experience nephropathy. After experiencing nephropathy, 4-17% after 20 years and about 16% after 30 years there will be diagnosed with ESRD DM [17]. In a matter of years, the condition development of microalbuminuria, from macroalbuminuria becoming microalbuminuria, and from macroalbuminuria increasing the concentration of creatinine plasma or renal replacement therapy.

This condition causes getting worse to hemodialysis patients because the patients will have complications of DM and influences patient's quality of life of [13]. Research conducted in Poland showed that physical health score on quality of life in hemodialysis patients with DM is lower than hemodialysis patients without DM [15]. Sorensen, et al., stated that quality of life in hemodialysis patients with DM run worse when compared with hemodialysis patients without DM [14].

DM influences various organs of the body, impaired visual function, heart disease, kidney damage, cerebrovascular disease and peripheral vascular disease, amputations and physical health problems. This condition causes limitations in performing daily activities and ability to work [18]. In addition, insulin or oral anti-diabetic medications, monitoring blood sugar continuously and dietary restrictions influence patient's quality of life [19].

ESRD patient's Quality of life with comorbid of DM is also associated with patient characteristics. Age ≥ 35 years have a increased risk to patients with DM and at that age begin to decline in GFR [20]. These conditions will influencent quality of life in hemodialysis patients. Male has higher risk of suffering from DM and ESRD [21]. However, male has better quality of life than female. This is because male has social relations and better support than female [22]. It is caused also because female feels that the disease is a burden for the family and worry about the body image and appearance. Females are not satisfied with themselves and they have negative feelings such as anxiety, melancholy, depression, and loneliness (Sathvik, B., et al., 2010).

Quality of life in hemodialysis patients with comorbid of DM are influenced by DM and its complications as well as the

management of DM. Patients who developed microalbuminuria necessary preventive measures before CKD. Enhancing the quality of life needs to be done to prevent complications of DM, as well as social and psychological support.

#### V. CONCLUSION

Results showed that hemodialysis patients have more comorbid of DM who have poor quality of life. Patients without comorbid of DM is likely to have good quality of life 4.2 times compared with patients with comorbid of DM. Comorbid of DM have correlation towards quality of life in hemodialysis patients. For further research should be able to use a longer time. In addition, this research is quantitative method. It would be better if this research is combined of quantitative and qualitative methods, or phenomenological research to deepen the research.

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