Medication-related burden of chronic renal failure patients at regional general hospital Sleman Yogyakarta

Woro Supadmi[*], Elinda Fitriana, Muhammad Muhlis
Faculty of Pharmacy, Universitas Ahmad Dahlan
Jl. Prof. Dr. Soepomo, S.H, Warungboto, Umbulharjo, Yogyakarta, Indonesia

ABSTRACT

Patients with chronic renal failure must undergo lifelong treatment. The condition raises treatment-related responsibilities and may affect their treatment adhesion. The aim of this study was to determine the correlation between the burden of medication and the level of medication adherence among chronic kidney failure patients at Sleman Regional Hospital in Yogyakarta. This study took the form of observational study with a cross-sectional design. Data were collected using LMQ (Living with Medicine Questionnaire) and Visual Analog Sacle (VAS) overall burden to determine the burden and MARS (Medication Adherence Rating Scale) to determine medication adherence level. The samples in this study were 60 patients from all patients undergoing hemodialysis who met the inclusion criteria. Sampling was taken using a consecutive sampling technique with inclusion criteria of patients willing to complete the questionnaire and patients diagnosed with chronic renal failure aged ≥18 years. To determine the relationship between medication burden and medication adherence, data was examined using the Spearman test. The results of this study showed that 40 patients (66.7%) had moderate medication burden and 50 patients (83%) had moderate medication adherence. There was a significant correlation between the LMQ score and MARS (correlation-coefficient = 0.581, p=0.000) and a significant correlation between the VAS score and MARS (correlation-coefficient= 0.651, p=0.000). Thus, it can be concluded that there is a positive relationship between treatment burden and the level of treatment compliance, where the higher the burden, the higher the level of compliance in chronic kidney failure patients.

Keywords: adherence, chronic renal failure, medication-related burden

*****Corresponding author:**
Woro Supadmi
Faculty of Pharmacy, Universitas Ahmad Dahlan
Jl. Prof. Dr. Soepomo, S.H, Warungboto, Umbulharjo, Yogyakarta, Indonesia
Email: woro.supadmi@pharm.uad.ac.id

INTRODUCTION

Chronic kidney disease also known as chronic kidney failure is caused by a glomerular filtration rate (GFR) of less than 60 mL/minute/1.73 m^2, and albuminuria does not exceed 30 mg per 24 hours, or signs of kidney damage appear (eg hematuria or structural abnormalities such as kidney polycystic or dysplastic) that lasts more than 3 months. Chronic renal disease is divided into 6 stage based on the Glomerular Filtration Rate (GFR), the last stage of which is considered renal failure. This stage is characterized by GFR <15 mL/minute/1.73 m^2 (NKF KDIGO, 2013). GFR below 15 mL/minute/1.73 m^2 can cause more serious symptoms and complications. In this condition, patients require renal replacement therapy such as dialysis or renal transplantation (Inker et al., 2014). Patients with chronic renal failure must undergo lifelong medication treatment and renal replacement therapy such as dialysis (Sarastika et al., 2019; Wiliyanarti & Muhith, 2019). During treatment, patients can have both good and bad experiences. A good treatment experience includes increased patient control over symptoms or disease conditions and clinical symptoms while a bad experience can be in the form of side effects, poor control of the disease, and discomfort due to side effects. Patients' daily life during medication therapy can be influenced by how the patient responds to the burden experienced (Gallacher et al., 2013).

Medication-related burden can be measured using the Living with Medicine Questionnaire (LMQ) instrument. LMQ covers several domains including relationships with other health workers, technical difficulties, high cost burden, perceived efficacy and side effects, attitudes, impact on daily life, and patient control over the treatment they experience (Krska et al., 2014). Research shows a significant relationship between medication burden and the level of medication adherence in disease treatment (Mohammed et al., 2016; Tesfaye et al., 2020; Tran et al., 2012).

Adherence is defined as a person's behavior in disease treatment (taking medication, following a diet, recommended lifestyle changes) in accordance with the health provider (WHO, 2003). Previous research found that the characteristics of respondents do not influence the level of medication adherence (Naafi et al., 2016). Instead, medication adherence is influenced by several external factors such as the patient's environment and family support (Hannan, 2013). Patient adherence can be measured using the Medication Adherence Rating Scale (MARS) questionnaire. MARS includes several questions related to a person's behavior towards treatment (Fialko et al., 2008). This study aims to determine medication-related burden, medication adherence, and the relationship between medication burden and medication adherence of chronic renal failure patients. The results of this study are expected to be used to solve problems if known factors that affect the burden of medication

METHOD

Methods

This research took the form of observational research and was carried out using a cross-sectional descriptive approach. This research involves observing and measuring variables simultaneously. Data was collected by survey using a questionnaire as a research instrument. The sample for this study was adult chronic kidney failure patients undergoing hemodialysis at Sleman Yogyakarta Regional Hospital who met the inclusion criteria. The inclusion criteria for this study are: (1) Patients who are willing to become research participants; (2) Patients diagnosed with chronic renal failure aged ≥18 years; (3) Patients who routinely undergo hemodialysis. Meanwhile, the exclusion criteria in this study were patients who had limitations in reading and communicating.

The research instrument used in this study consisted of (1) Living with Medicines Questionnaire (LMQ) which consists of 41 items in the form of a Likert scale and open-ended question. Participants were given choices between "strongly agree", "agree", "neutral", "disagree", "strongly disagree". Open-ended question enabled participants to answer freely without any restrictions. This instrument covered 8 domains which include relationship or communication with health workers, technical difficulties, burden related to costs, side effects, medicine effectiveness, concerns about the impact or interference of medicine use in daily life, and control of medicine use. The LMQ score was summed

from the 41 questions to describe the overall score ranged from 41-205. The higher the score, the greater the burden. The scores can be categorized into no-burden = 41-73; low burden = 74-106; medium burden = 107-139; high-burden = 140-172; very-high burden = 173-205 (Katusiime et al., 2018). This questionnaire also contains a Visual Analog Scale (VAS) to determine the overall assessment of the burden experienced by respondents on a scale of 0-10, the higher the VAS score, the greater the burden (Katusiime, 2017; Zidan et al., 2016). (2) Medication Adherence Rating Scale (MARS) questionnaire was also used to assess patient medication adherence. This questionnaire consists of 5 questions with answers in the form of an ordinal scale. Respondents were given choices between "always", "often", "sometimes", "rarely", and "never". The MARS score was obtained from the sum of the 5 questions with the final score ranging from 5-25. The adherence score was categorized into three: high adherence = 25; moderate adherence = 6-24; and low adherence = 5 (Naafi et al., 2016). The questionnaire used has been validated in previous research entitled "Medication-Related Burden in Thalassemia Patients in the Hospital Dr. Hasan Sadikin Bandung" with a p value = <0.05 so that the questionnaire is valid to be used (Kudri, 2019). Ethics approval was obtained from the Regional General Hospital Sleman Yogyakarta Indonesia (No.180/2909: 05 September 2020).

Data Analysis

Descriptive analysis technique was used to obtain the percentage of each variable, namely characteristics, burden, and adherence. We use testing method by Mann Whitney and the method by Kruskall Wallis to determine the connection between respondent characteristics and burden. To determine the relationship between treatment burden and treatment adherence with numerical data analyzed with the Spearman test

RESULT AND DISCUSSION
Patient characteristics

There were 60 respondents who participated in this research. Data on the demographic of participants and medication characteristics is presented in Table 1.

Table 1 shows that the participants in this study consisted of 22 male patients (36.7%) and 38 female patients (63.3%). Similar research also reported that the number of chronic renal failure patients at Dr. Mohammad Hoesin Palembang was dominated by female at 169 (56.3%) compared to male at 131 people (43.7%) (Hervinda et al., 2014). Although there were more female patients involved in this study, gender is not a major risk factor for chronic renal failure since it can occur in both men and women. In terms of age, the respondents were divided into 6 categories. 18 patients chronic renal failure patients (30.0%) in this study were 46-55 years. Clinically, patients aged >60 years are at greater risk of chronic renal failure compared to patients aged <60 years. This is because the renal function decreases as the body gets older (Pranandari & Supadmi, 2015). The participants' employment status was divided into 3 categories: employed, unemployed, and students. A total of 49 chronic renal failure patients (81.7%) were unemployed. This shows that the physical condition of chronic kidney failure patients causes patients to reduce their activity so that it becomes an obstacle in work. The respondents' education level was divided into 2 categories: l ≤12 years of education and >12 years of education. A total of 54 chronic renal failure patients (90.0%) had ≤ 12 years of education which shows that a significant number of respondents have basic education level.

Based on the number of medicines consumed, 56 chronic renal failure patients (93.3%) consumed more than 1 type of medicine. These medicines consist of folic acid supplements, calcium, and other medicines such as antihypertensives. Research showed that the greater the number of medicines consumed, the more the patient's treatment burden increases (Krska et al., 2018). Thus, taking a large number of medications can disrupt patients' daily life. In terms of hemodialysis frequency, 56 chronic renal failure patients (93.3%) had undergone hemodialysis therapy for >6 months and all chronic renal failure patients (100.0%) underwent hemodialysis therapy twice a week. 60 chronic renal failure patients (100.0%) involved in the study were not charged for their treatment because they were National Health Insurance users. A total of 29 chronic renal failure patients (48.3%) needed

companion taking medication in the family for help or supervision in taking medication. The assistance provided is in the form of preparing medication and reminding of the medication schedule.

Table 1. Characteristics of chronic renal failure patients at Sleman regional general hospital, Yogyakarta

	Variable	Frequencies (n = 60)(%)
Gender	Female	22 (36,7)
	Male	38 (63,3)
Age	18 - 25 years	3 (5,0)
	26 - 35 years	9(15,0)
	36 - 45 years	12(20,0)
	46 - 55 years	18(30,0)
	56 - 65 years	15(25,0)
	> 65 years	3(5,0)
Employment Status	Employed	10(16,7)
	Unemployed	50(83,3)
Education Level	Education ≤12 years	54(90,0)
	Education >12 years	6(10,0)
The number of drugs one daily	1 drug (Single therapy)	4(6,7)
	>1 drugs (Combination therapy)	56(93,3)
Dosage Forms	Tablet/Capsule	60(100,0)
frequency of taking the drug in one daily	1 x day	13(21,7)
	2 x day	23(38,3)
	3 x day	24(40,0)
National Health Insurance Participation	Yes	60(100,0)
Companion Taking Medication	Yes	29(48,3)
	No	31(51,7)

Medication-related burden

The analysis results are presented in Table 2. The results of the medication-related burden analysis obtained based on the Living with Medicines Questionnaire (LMQ) scores in chronic renal failure patients revealed that there were more participants with moderate burden (66.70%) than participants with low burden of 20 people (33, 3%). There were no patients with high, very high, and no burden. The lowest LMQ questionnaire score in this study was 87 while the highest LMQ questionnaire score in this study was 135.

Table 2. Medication-related burden of chronic renal failure patients at Sleman regional general hospital, Yogyakarta

Variable	Range	Average	Frequencies (n = 60)(%)
Overall LMQ Score			
No burden	41-73	109.51	0 (0.0)
Low burden	74-106		20 (33,3)
Moderate burden	107-139		40 (66.7)
High burden	140-172		0 (0.0)
Very high burden	173-205		0 (0.0)
VAS: overall burden	0-10	4.14	

Patient adherence

The results by MARS questionnaire, a score was obtained which was used to categorize the level of adherence of chronic renal failure patients as shown in Table 3.

Table 3. The medication adherence of chronic renal failure patients at Sleman regional general hospital, Yogyakarta

Variable	Range	Average	Frequencies (n = 60)(%)
Overall MARS score			
High adherence	25		10 (16.7)
Moderate adherence	6-24	21.78	50 (83.3)
Low adherence	1-5		0 (0.0)

Based on the data in Table 3, it shows that chronic kidney failure patients in this study had an average score of 83.3%. In a previous study of 150 patients, 22% of patients had high adherence to medication use, 55% had low adherence and 23% had moderate adherence (Ahlawat & Tiwari, 2016). Previous research showed that only 61.3% of the study population adhered to their treatment regimen. Forgetfulness in 79.8% was the main reason for non-adherence to treatment (Kefale et al., 2018). Most patients lacking medication adherence forgot to take their medication or took their medication less than the recommended dosage. Based on the results of questionnaire there were patients who stopped taking medication temporarily because they felt bored with the medication routine. Some patients also felt that there was no significant change in their health condition after regularly taking medication so they decided to take less medication than the prescribed dose.

The correlation between the burden of medication and patient adherence

The Spearman rho correlation analysis was performed to analyze the relationship between medication-related burden and the level of adherence in chronic renal failure patients. This analysis was carried out to determine the relationship between the results of the LMQ instrument analysis, LMQ domains, VAS scores, and MARS instruments. Data obtained from this analysis are presented in Table 4.

Based on the results of the analysis, it was found that almost all domains of the LMQ and VAS received a significance value of <0.05, which means there is a relationship between medication-related burden and the level of compliance with taking medication.There were three domains that have a significance value of >0.05, namely domains 1, 3, and 7, so it can be concluded that domains 1, 3, and 7 do not have a significant relationship with MARS (Medication Adherence Rating Scale).

Based on the correlation results of LMQ and VAS scores with MARS, the correlation coefficients were positif 0.581 and 0.651 respectively with a significance of 0.000, indicating that there is a positive correlation between LMQ scores and VAS scores with MARS scores. The higher the burden, the higher the level of adherence in chronic renal failure patients. This is in accordance with research conducted by (Zidan et al., 2016) which showed that the higher the burden felt by the patient during medication treatment, the higher the level of patient adherence (LMQ-MARS correlation coefficient= 0.317; VAS-MARS correlation coefficient= 0.325; p< 0.05). Several factors that influence this include family support and attention to the lives of chronic renal failure patients, the family's understanding of chronic renal failure, as well as the attitude and quality of family relationship towards chronic renal failure patients (Saraswati et al., 2019).

Table 4. The relationship between medication-related burden and patient adherence of chronic renal failure patients at Sleman regional general hospital, Yogyakarta

M*edication related burden* (LMQ Domains)	Adherence	*Coefficient correlation*	*p* value
Domain 1 (Relationship/Communication with Health Professionals Regarding Medicines)		0.212	0.104
Domain 2 (Technical Difficulty)		0.269	0.038*
Domain 3 (Cost-Related Burden)		0.225	0.084
Domain 4 (Side-Effects)	MARS Score	0.463	0.000*
Domain 5 (Medicine Effectiveness)		0.291	0.024*
Domain 6 (Attitudes/Concerns Regarding Medicine Use)		0.347	0.007*
Domain 7 (Impact or Interference on Daily Life_		-0.009	0.994
Domain 8 (Control/Autonomy in Varying Medicine Regimen)		0.385	0.002*
LMQ Score		0.581	0.000*
VAS Score		0.651	0.000*

Note:
*There is a significant relationship < 0.05

CONCLUSION

The results of the LMQ questionnaire showed that 20 patients (33.3%) experienced low burden and 40 patients (66.7%) experienced moderate burden. From the level of compliance, 50 patients (83.3%) had a moderate level of compliance and 10 patients (16.7%) had a high level of compliance. These findings indicate that there is a positive correlation between treatment-related burden (LMQ score and VAS score) and the level of treatment adherence (MARS score) with correlation coefficients of 0.581 and 0.651 respectively, p=0.000 (p<0.05). Thus, it can be concluded that treatment-related burden is positively correlated with treatment adherence.

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