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Original Article

ROLE OF PHARMACIST IN COUNSELING ASTHMA TO IMPROVE PATIENT ADHERENCE IN YOGYAKARTA

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ABSTRACT

Objective: To identify the effect of pharmacist-provided counselling on patient adherence and to examine the correlation between adherence level and asthma therapy outcome.

Methods: Quasi-experimental through control-group design with pretest-posttest. The study was conducted during February–June 2013 (N=120). Only the intervention group received pharmacist counselling. All participants completed MMAS and ACT questionnaires before and after counselling. They were 18–60 y old and having<8 MMAS pretest score with moderate-severe persistent asthma.

Results: The intervention was pharmacist counselling for 56 patients, and the control group had 50 patients. After counselling, 3.92% severe persistent asthma patients showed low-medium adherence, and 62.64% moderate persistent asthma patients had medium-high adherence. The change of MMAS score in the intervention group was 3.71 and 2, and 1.23 and 1.64 in the control group. Wilcoxon and Mann Whitney test indicated a significant difference in patient adherence before and after counselling ($p<0.001$; $r=0.583$).

Conclusion: Pharmacist counselling affects asthma patient adherence. There is a significant correlation between adherence and therapy outcome.

Keywords: Asthma, Counseling, Adherence, Therapy outcome

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INTRODUCTION

Asthma is a chronic inflammatory disorder of the airways involving various cell types and associated with airflow obstruction that is spontaneously reversible or reversible under-treatment [1]. Treatments for asthma patients do not necessarily recover the condition due to low adherence, health service quality, medical staff's attitude and skills, as well as patients' attitude and lifestyle that can trigger uncontrolled asthma [2]

Studies of compliance with chronic illness therapy revealed that 70 % patients did not take medications as prescribed, showing low adherence [3]. According to WHO report for 2003, the average adherence to long-term therapy among patients with chronic illness in advanced countries was only 50%, while in developing the world this fig. was even lower [4]. Low adherence to asthma therapy has the potential to hinder the effort to obtain controlled asthma.

A study of medication adherence among asthma patients is important to assess the effectiveness of therapy for obtaining controlled asthma. One of the methods to measure adherence to medication is the Morisky Medication Adherence Scale (MMAS) questionnaire that consists of 8 question items [5].

Controlled asthma signified by reduced frequency of asthma attacks is one of the indicators or parameters of therapy success. It can be measured using the Asthma Control Test (ACT) questionnaire [6]. Therefore, counselling should be of the center of attention among health professionals since it can function as a reference of medication adherence and therapy success [7].

This study aimed to examine the effect of pharmacist counselling on adherence level as well as to identify the correlation between adherence and therapy outcome among asthma outpatients in Respiratory Hospital Yogyakarta.

MATERIALS AND METHODS

This study was a quasi-experimental control-group design with pretest-posttest conducted on asthma patients who were present at Respiratory Hospital in Yogyakarta, Indonesia. The Ethics Committee of the Medical Faculty of Gadjah Mada University Yogyakarta, through the letter numbered KE/FK/191/EC, has approved the study. Data were collected from 120 consecutive asthma patients who visited the hospital between 1 February and 30 June 2013. The inclusion criterion included the willingness to participate in the study proven by signing the informed consent. Meanwhile, the exclusion criteria were pregnant and lactating women, having other respiratory complications, and patients with heart failure or renal failure. Morisky Medication Adherence Scale (MMAS) and Asthma Control Test (ACT) were used as a combined questionnaire to assess the patient adherence and asthma control level. Each patient was interviewed, and the questionnaire was completed during a routine visit. Assessment of the adherence was done before and after the patients received an intervention in the form of pharmacist counselling. No therapeutic interventions were performed until the completion of the study protocol. As an intervention, the pharmacist counselling was provided in the 2nd and 4th week of the hospital visit. The asthma severity levels and prescribed anti-asthma medication data were compiled by the researcher. Patients were divided into 2 groups (control and intervention) based on the order of visit and asthma severity levels. There were 50 patients in the control group and 56 patients in the intervention group. The baseline of patient adherence was assessed in the first visit. Next, the patients received education about

medication adherence through counseling and information leaflet. During the first and second follow-up, the adherence was assessed using MMAS questionnaire. Scores were given based on the number of correctly answered questions. If patients answered, "No", 1 score was given, and a "Yes" carried 0 score. Meanwhile, the ACT consisted of 5 questions each with 5 answer options. Each answer was assigned a score ranging from 1 to 5, with the total questionnaire score between 5 and 25. A maximum score of 25 means good asthma control, 24-20 points signifies fair control, 19-15 points indicates partial control, and a score lower than 15 shows poor control.

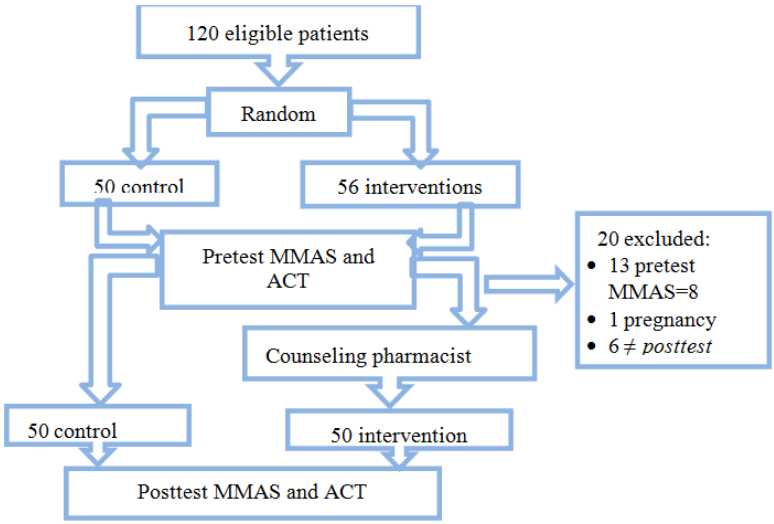

Fig. 1: Flow of participation throughout the study

Statistical analysis

The statistical analysis was performed in three stages. For the first stage, the reliability of MMAS and ACT was validated. The second stage used descriptive statistics to describe the study population. IN the third stage, the Mann Whitney test was utilised to identify the difference in the adherence after pharmacist counselling was provided. The Wilcoxon analysis was used to find the difference of results between the control and intervention group. The final model used the variables that were statistically significant at the level of $p<0.01$.

RESULTS

Among 120 eligible asthma patients, 100 of them completed the participation, 47% males and 53% females. The questionnaire validity test on 30 patients resulted in $r>0.361$.

Table 1: Patients' demography

Characteristics		Group				p Value
		Control (n= 50)		Counseling (n= 50)		
		n	%	n	%	
Gender	Male	22	44	25	50	0.254
	Female	28	56	25	50	
Age	18-24 y	2	4	2	4	0.349
	25-44 y	22	43	23	46	
	45-65 y	26	53	25	50	
Education	≤ high school/on a par	21	42	25	50	0.259
	>high school/on a par	26	58	25	50	
Asthma period	<5 y	8	15	14	28	0.303
	5-10 y	20	40	21	42	
	>10 y	22	45	15	30	

The given therapy was a combination of oral and inhaled β2-adrenergic agonist (short acting), methylxanthines, and corticosteroid.

Table 2: Asthma therapy

Medication	Counseling group		Control group		*p-value*
	n	%	n	%	
Methylxantine+oral short β2-adrenergic	8	16	5	10	0.233
Corticosteroid+oral short β2-adrenergic	3	6	5	10	
Methylxantine+oral short β2-adrenergic+corticosteroid	16	32	17	34	
Methylxantine	3	6	8	16	
Methylxantine+inhaled short β2-adrenergic+corticosteroid	2	4	1	2	
Total	50	100	50	100	

The interview data and medical record in the hospital revealed that some additional medicine was used to resolve complaints commonly accompanying patients' visits (a cough, nasal congestion, itching, and dizziness).

Table 3: Types of additional medicine for patients

Medication	Counseling group		Control group		*p-value*
	n medicine	%	n medicine	%	
Mucolytic-expectorant	35	55.56	40	64.52	0.023
Antitussive	3	4.76	2	3.22	
Anti-allergy	22	34.92	20	32.26	
Paracetamol	3	4.76	0	0	
Antibiotic	1	1.59	0	0	
Total	63	100	62	100	

Patient adherence can affect the success of medication. Assessing the level of medication adherence becomes one of the methods to evaluate and monitor the effects of therapy on patients

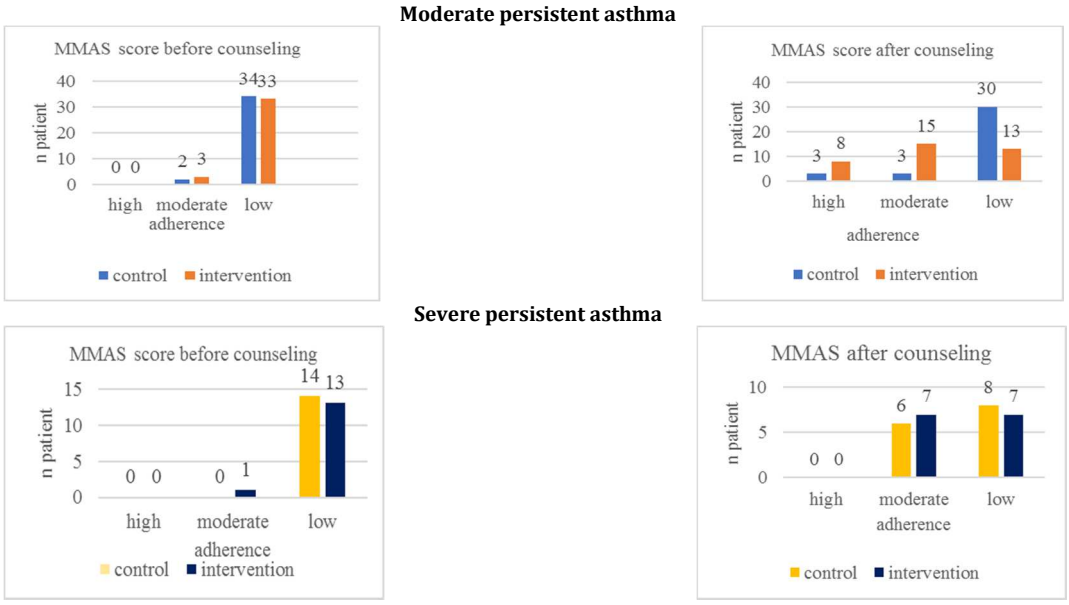

Fig. 2: Distribution of adherence levels

The results in fig. 4 showed that patients with moderate and severe persistent asthma had low adherence prior to counselling. After pharmacist counselling, patients with moderate persistent asthma had 62.64% detectable change at the high-medium level, while those with severe persistent asthma had 3.92% detectable change at low-medium level.

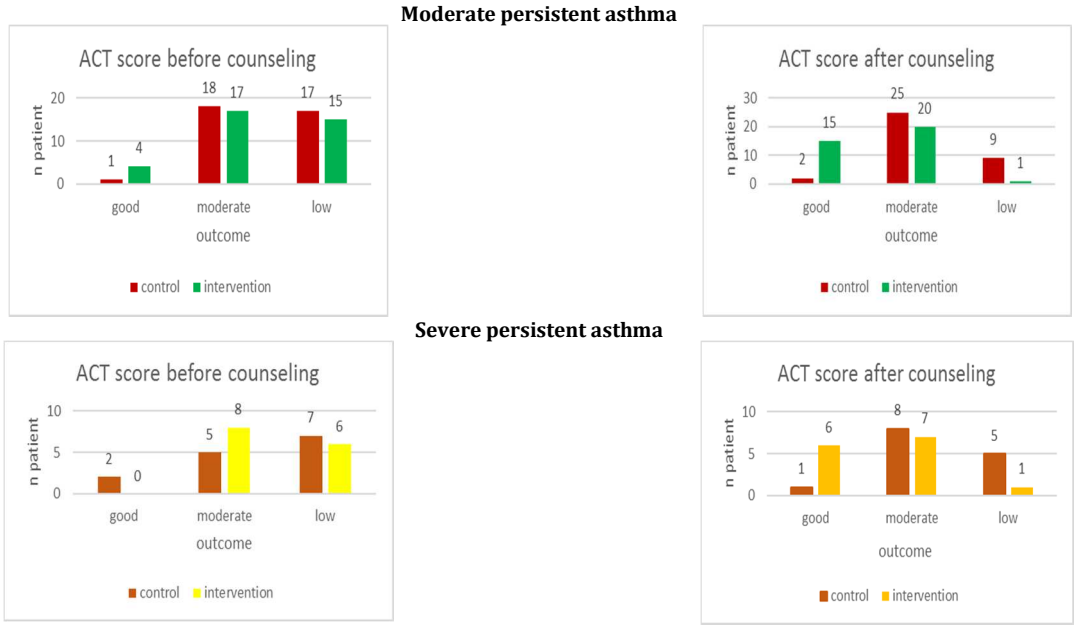

Fig. 5: Distribution of therapy outcome

After receiving counselling, 35 patients with moderate persistent asthma had average-good therapy outcome. In addition, 13 of those with severe persistent asthma also indicated an increase to an average-good level in therapy outcome.

Table 4: Minimal detectable change of MMAS score

		Average minimal detectable change of MMAS score		Average Δ Change	P Value[1]	P Value[2]
		Before counseling	After counseling			
Moderate persistent	Control	3.88	5.11	1.23	0.000	0.000
	Intervention	3.97	7.68	3.71	0.000	
Severe persistent	Control	3.64	5.28	1.64	0.000	0.000
	Intervention	3.92	5.92	2	0.000	

The Wilcoxon and Mann Whitney test results for both intervention and control groups indicated a change ($p<0.001$) [$\alpha<0.05$]. Patients with moderate persistent asthma had almost high adherence after counselling (MMAS 7.68). Meanwhile, severe persistent asthma patients had medium adherence level (MMAS 5.92). The minimal detectable change of MMAS score in the intervention group was 3.71 and 2, while that of the control group reached 1.23 and 1.64.

Table 5: Minimal detectable change of ACT score

		Average minimal detectable change of ACT score		Average Δ change	P Value[1]	P Value[2]
		Before counseling	After counseling			
Moderate persistent	Control	14.67	16.02	1.56	0.000	0.000
	Intervention	14.44	19.97	5.53	0.000	
Severe persistent	Control	13.64	15.28	1.64	0.000	0.000
	Intervention	14.78	20.14	5.36	0.000	

Note: [1]: Wilcoxon test, [2]: Mann Whitney test, The Wilcoxon and Mann Whitney test indicated a significant difference in both control and intervention groups ($p<0.01$ [$\alpha<0.05$]. There was a significant difference between the ACT of control group and that of the intervention group.

Table 6: Correlation among counselling, adherence, and therapy outcome

	Adherence		Conclusion
	p value	r value	
Counseling	.000	.590*	Significant correlation between adherence and therapy outcome, weak correlation, positive correlation
Therapy Outcome	.000	.583*	

Note*: Spearman test, This study is statistically significant since the correlation coefficient reached 0.590, which indicated that counselling affected adherence by 34.81%, and other variables affected the remaining. In addition, it also showed that adherence affected therapy outcome by 33.98%, and the remaining was affected by other variables.

DISCUSSION

The findings indicated that the counselling by clinical pharmacist produced a statistically significant improvement in patient adherence to prescribed medication. A similar study carried out by Mehuys E. *et al.* [6] found that pharmacist intervention substantially improved both the inhalation technique and medication adherence. Hinchageri S. *et al.* [9] also concluded that pharmacist-provided counselling significantly influenced the improvement of patient adherence to prescribed therapy and helped to improve the inhalation techniques and the understanding of their treatment. In addition, Levy *et al.* [10] reported that an intervention involving asthma education from a hospital-based asthma-specialist nurse improved adherence and clinical outcome of asthma patients.

This study did not assess the correlation between counselling and drug therapy. Most of the therapy provided by the hospital is oral prescription, and only a few patients receive inhalation medication or MDI due to the limited availability of inhaler including corticosteroid and β2-adrenergic agonist in the hospital. Only patients with severe asthma will receive inhalation therapy. Most of the drugs are available in oral form and come from government subsidy given therefore free of charge to asthma patients.

Patients with severe persistent asthma seemed to have low adherence, and even after counselling, the patients in this group showed only medium adherence. There was a decrease by almost 50% among patients with low adherence both before and after counselling. Theoretically, patients with severe persistent asthma will have better adherence compared to those at a moderate level. The discrepancy found in this study was likely caused by uncontrolled confounding variables, including patients' knowledge level of asthma, attitude and openness during the research, as well as the perception of medication that might influence adherence [11].

Medical staff can educate patients with low adherence and those who stop taking drugs when feeling better or worse about asthma and the importance of taking drugs as prescribed. On the other hand, if patients have high adherence but with frequent recurrence of asthma, it is worthwhile to consider increasing the dosage or prescribing additional asthma drugs to the patients. Then, patients can be provided with an understanding that they will constantly need the drugs to control the recurrence of asthma attacks and that the success of asthma therapy is highly dependent on patient adherence to medication. Patients with high medication adherence are expected to have controlled asthma and successful therapy outcome [12].

Counselling is one of the efforts to improve patient adherence to their therapy so as to control asthma attacks. However, medication adherence is a multidimensional phenomenon involving such factors as a patient, therapy, health system, environment, as well as socio-economic. In addition, a strong commitment and good coordination among all parties, including patients and medical professionals, are required to overcome patient noncompliance with treatment so as to achieve optimum therapy outcome [13].

This study obviously has a limitation due to the absence of pulmonary function test data that includes FEV (Forced Expiratory Volume) or PFR (Peak Volume Rate) values. The researcher grouped the severity levels based on common symptoms and night symptoms obtained from interviews with asthma patients; therefore, the severity data were likely to be subjective. In addition, the researcher did not control confounding variables, including the level of knowledge, attitude and perception of medication that affect

adherence, and other education (from the neighbourhood/ workplace, the internet, advertisement, books, or expert opinions) apart from the counselling provided by the researcher, which are difficult to control. Also, access to drugs is limited to oral anti-asthma. The counselling for the intervention group provided twice in the second and fourth week is deemed insufficient to change patients' attitude; therefore, it is recommended to provide regular sustainable counselling.

CONCLUSION

Pharmacist-provided counselling affects adherence improvement. There is a significant correlation between adherence and therapy outcome since the higher the patient adherence, the better the therapy outcome for asthma patients.

CONFLICTS OF INTERESTS

All authors have none to declare

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