IMPACT OF PHARMACIST COUNSELING AND BOOKLET INTERVENTION ON PATIENT'S ADHERENCE AND SYSTOLIC BLOOD PRESSURE OF AMBULATORY HYPERTENSION PATIENTS IN INTERNAL DISEASE POLYCLINIC PKU MUHAMMADIYAH BANTUL, HOSPITAL, INDONESIA

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Abstract

Background. *Prevalence of hypertension increased in line with changes of life style as smoking, obesity, non physical activity, psycho-social stress in many countries. Comprehensive and intensive antihypertension intervention could be more control of the blood pressure of patient. Counseling and provision of appropriate information by pharmacists is expected to improve adherence of patient on drug therapy in decreasing the blood pressure.*

Objective. *The aim of this study is to investigate the influence of pharmacist counseling and booklet on the adherence and decrease systolic blood pressure of ambulatory hypertension patients at internal disease polyclinic PKU Muhammadiyah Bantul Hospital, Indonesia.*

Methods. *This study was conducted with quasi-experimental design. The ambulatory hypertension patients data were collected prospectivelly during the period of January until April 2013. Sixty patients were divided into 2 groups, 30 (50%) patients receive a pharmacist counseling and booklet (intervention group) and 30 (50%) without a pharmacist counseling and booklet (control group). Exclusion criteria was pregnancy, deaf and illiterate. Data collection were conducted by interview and completion Morisky Medication Adherence Scale (MMAS) adherence questionnaire, while values of blood pressure were taken from medical records.*

Outcome Measured. *Adherence and systolic blood pressure of ambulatory hypertension patients.*

Results. *The results showed that pharmacist counseling and booklet could increased the patients adherence in the intervention group (66.7%) in comparison to the control group (20%) (p=0.001). Accordingly, pharmacist counseling and booklet intervention could decreased the systolic blood pressure in the intervention group of (15.2 mmHg, p=0.000). There was no decreasing the systolic blood pressure (1.27 mmHg, p=0.730) in the control group. There were positive correlation in patients adherence and systolic blood pressure value (p=0.024, r=0.410).*

Conclusion. *In Summary, the pharmacist counseling and booklet intervension can increase the patients adherence on antyihypertension management. Moreover, it can decrease systolic blood pressure patients (p<0.05).*

Keywords : *hypertension, pharmacist counseling, adherence, systolic blood pressure, booklet.*

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INTRODUCTION

Hypertension is one of the main factors triggering *coronary heart disease* and stroke. WHO has estimated about 62% of *cerebrovascular disease* and 49% of *ischemic heart disease* in the world can be caused by blood pressure levels. High blood pressure is estimated to cause 7.1 million deaths per year (WHO and IPF, 2006).

In many countries, the prevalence of hypertension increases with lifestyle changes such as smoking, obesity, physical inactivity, and psychosocial stress. In Indonesia, there are no complete national data concerning the prevalence of hypertension. The National Household Health Survey (*Survei kesehatan Rumah Tangga* (SKRT)) in 1995 found that the prevalence in Indonesia was 83%. The prevalence of hypertension in the ages of more than 50 years ranged between 15% - 20% (The Department of Health, 2007).

Hypertension attacks human body very slowly. Patients with hypertension may have no symptoms for years. This latency period covers the development of the disease until significant organ damage occurs. If any symptoms are indicated, those signs are usually non-specific ones such as headaches or dizziness. If hypertension remains unknown and untreated, this results in death due to heart failure, myocardial infarction, stroke, or kidney failure. However, early detection and effective intervention of hypertension can reduce the amount of morbidity and mortality. Thus, regular blood pressure checks have significance in the intervention of hypertension (Brown, 2006).

Healthy People 2010 for Hypertension suggest a more comprehensive approach and intensive in order to achieve optimal blood pressure control. So to achieve that goal, it needs the active participation of pharmacist in implementing the practice of his profession at every place of health care. Pharmacist can work with doctors in providing education to patients about hypertension, monitoring the response of patients, adherence to drug therapy and non-drug, detect and identity side effect early reaction, and prevent and or solve problems associated with providing drugs (The Department of Health, 2007).

One of the possible interventions by pharmacists for the hypertension patients' handling is counselling. Counseling intended to improve therapy result by maximizing the appropriate medications (Rantucci, 1997). One of the benefits of counseling is to improve the patients' adherence of drugs usage. Therefore, mortality rate and losses (both cost and productivity) can be abated (Palaian *et al*, 2006). Not only held verbally, counseling can also accompanied by written matter that serves to increase knowledge and strengthen what is delivered by farmasis when counseling (The Department of Health, 2007).

Based on the findings of the research by (Palanisamy and Sumathi in 2009), it is explained that the intervention by providing education and counseling to patients can improve adherence to intervention. The interventions of pharmacists improve blood pressure control of the patients with hypertension who have uncontrolled blood pressure (Mehos *et al,* 2000).

The findings of the research carried out by (Mansoor *et al.* 2008) suggested that written materials accompanied by verbal consultation can have a positive impact in improving adherence. The research by Mulyasih, (2011) showed that the provision of verbal counseling and leaflets can affect adherence and lower systolic and diastolic blood pressure until it reaches the target. Based on the research by Rostikarina, (2011), the provision of *Home Pharmacy Care (Booklet)* contributed significantly to increase knowledge about the use of oral antihypertensives in patients with hypertension.

Self-report scale to assess adherence with the use of antihypertensive drugs have been developed by Morisky *et al*, (2008). Reseach to test the psychometric and predictive validity of the structure of self-report medication adherence

in hypertensive patients tested in 2007 and published in January 2008. Adherence with the use of drugs was measured with the new 8-item self-report Morisky Medication Adherence Scale (MMAS).

Based on the information above, it is necessary to study to see the effect of the provision of pharmacist counseling and booklets on the adherence and the therapy result (systolic blood pressure) of hypertension intervention in internal disease polyclinic PKU Muhammadiyah Bantul Hospital, Yogyakarta.

OBJECTIVE

1. To investigate the influence of pharmacist's counseling and *booklet* on the adherence and therapy result (systolic blood pressure) in hypertensive patients in internal disease polyclinic in PKU Muhammadiyah Bantul Hospital, Yogyakarta

2. To investigate the relation of adherence with the terapy result in hypertensive patients in internal disease polyclinic in PKU Muhammadiyah Bantul Hospital, Yogyakarta.

METHODOLOGY

The research belongs to a quasi-experimental research. Subjects were all hypertension patients in internal disease polyclinic in PKU Muhammadiyah Bantul Hospital, Yogyakarta period January to April 2013. They were divided in to two groups as intervention group and control group. The intervention group is the group of patients who received a pharmacist counseling and *booklet* and control group patients is the group of patients who did not recieve a pharmacist counseling and *booklet*. Data were collected prospectively and research result was presented descriptively. All patients received information regarding the objectives of the study and gave their written informed consent.

Data collection were conducted by interview and completion *Morisky Medication*

Adherence Scale (MMAS) adherence questionnaire, while values of blood pressure were taken from medical records. The inclusion criteria were adults patients, both men and women with age 18-65 years old, who conducted control in PKU Muhammadiyah Bantul Hospital, Yogyakarta, they were diagnosed by a doctor to have suffered levels I and II hypertension with or without dyslipidemia and diabetic mellitus (DM), they got more antihypertensive drugs more than or equal to 1 antihypertensive drug, not illiterate and gave their written informed consent. The exclusion criteria were patients with pregnancy, deaf, and illiterate. After all required data is obtained, which is from medical record data, health assessment, MMAS questionnaire, blood pressure, do data processing with statistical methods using SPSS version 16. Statistical analysis used normality test, if P>0.05 normally distributed, independent t-test and paired t-test, whereas if p <0.05 distribution is not normal, Mann Whitney and Wilcoxon test is used. p <0.05 significance indicates significant different result between groups.

RESULT AND DISCUSSION

The research was conducted during January to April 2013 in internal disease polyclinic in PKU Muhammadiyah Bantul Hospital, Yogyakarta. The research was conducted prospectively toward hypertension outpatients. Sampling was done by cosecutive sampling method, whereas all subjects came sequentially and met the selection criteria were included in the research until the number of the subjects required fulfilled. The subjects selection for each group was done randomly, whereas all subjects who met the research criteria were divided into two groups by putting the odd-numbered subjects into the control group, while even-numbered subjects were included into the intervention group.

The subjects who joined the research from the beginning to the end of the research were 60 patients, consisting of 30 patients who received a pharmacist counseling and *booklet* from the

researcher (intervention) and 30 patients who did not receive a pharmacist counseling and *booklet* (control).

1. The Patients' Demography

The distribution of the variety subjects characters of the intervention group to the control group was shown on table I.

In this research, the relationship of the various subjects characteristics in the intervention and the control groups obtains a non-significant relationship (P>0.05) among the characteristics of gender, age, education, employment, payment, history of hypertension, smoking habits, and degree of hypertension..

In this research, based on the data characteristics of the patients, it can be seen that the majority of the research subjects; both control and intervention groups are women, each amounted to 21 (70.0%) in the control group and 19 (63.3%) in the intervention group, with the

Table I. Distribution of subjects characters in intervention group to control group

Subjects characters	Intervention Group		Control Group	
	(N=30)	%	(N=30)	%
Gender				
Man	11	36.7	9	30
Women	19	63.3	21	70
Age (years old)				
18-29	1	3.3	0	0
30-39	3	10	0	0
40-49	8	26.7	5	16.7
50-59	10	33.3	16	53.3
60-65	8	26.7	9	30
Education				
0-9 years	18	60	20	66.7
10-12 years	7	23.3	6	20
>12 years	5	16.7	4	13.3
Employment				
Civil Servants	3	10	7	23.3
Entrepreneur	18	60	16	53.3
Labor	8	26.7	5	16.7
Not Work	1	3.3	2	6.7
Payment				
General	7	23.3	12	40
Askes	8	26.7	9	30
Jamkesmas	13	43.3	8	26.7
Other Insurance	2	6.7	1	3.3
History of Hypertension				
Yes	17	56.7	9	30
No	13	43.3	21	70
Smoking Habit				
Smoking	5	16.7	3	10
No smoking	25	83.3	27	90
Degree of Hypertension				
Level I	11	36.7	19	63.3
Level II	19	63.3	11	36.7

most dominating age is in the range of 50-59 year-old; i.e. 16 (53.3%) in the control group and 10 (33.3%) in the intervention group. The patients' education level dominates on educational age of 0-9 years, 20 (66.7%) in the control group and 18 (60%) in the intervention group.

This research also conducted assessment whether there was or there was not an existence of cardiovascular risk factors, namely smoking habits and hypertension history. The majority of the patients did not have smoking habits both in control and intervention groups (90%, 83.3%), while for hypertension history in the intervention group shows higher number; i.e. 56.7% compared to the control group which dominates the patients with no hypertension history previously, which is 30%. In the control group shows to have patients with hypertension degree I 19 (63.3%) and patients with hypertension degree II 19 (63.3%) in the intervention group.

2. Adherence Assessment

The patients' adherence affects on to the success of a intervention. The therapy result will not reach the optimal level without the awareness of the patients themselves, in fact, it may lead into a intervention failure, and it may also cause highly harmful complication and eventually becomes fatal (Hussar, 1995). Thus, it requires outpatients' non adherence identification to determine the effectiveness of the hypertension control level improvement.

In this research, the patients' adherence parameter was measured using the MMAS both on the control group and the intervention group. MMAS score assessment result is shown in Table II.

The MMAS questionnaire had a total score of 8, with the category of high adherence (MMAS value=8), moderate adherence (MMAS score=6 <8) and low adherence (MMAS value=<6). The assessment of adherence using the MMAS was done until the second visit both to the control group or the intervention group. The results presented in Table II explain that the high adherence category (MMAS score=8) is greater in the intervention group that the one in the control group (66.7% or 20 patients>20% or 6 patients). This suggests that counseling from pharmacists and booklets contribute positively to the adherence of the patients in the intervention group.

Statistical comparison between MMAS value ??in the control group and the intervention group is done by testing the normality. The results of *Kolmogorov Smirnov* normality test showed that the data of both the control group and the intervention group were not normally distributed therefore a non-parametric test using the Mann-Whitney test was conducted. Based on the test results, the significance value of 0.001 ($p < 0.05$) was obtained. Therefore, it can be

Table II. MMASScores on HypertensionPatients in Intervention and Control Group after Get Counseling in the Final Research.

Group	MMAS Scores					
	High Adherence		Moderate Adherence		Low Adherence	
	Σ	%	Σ	%	Σ	%
Control (n=30)	6	20	16	53.3	8	26.7
Intervention (n=30)	20	66.7	10	33.3	0	0
P value	0.001*					

Description :

MMAS : Morisky Medication Adherence Scale

Table III. The Reasons for non-adherence of patients based on a questionnaire MMAS.

No	Reasons for non-adherence	Group		Total (%)
		Intervention	Control	
1	Forgot	0	8	13.3
2	Deliberately not taking medication	1	4	8.3
3	Being distracted by having to take medication	3	8	18.3

concluded that there are significant differences between the MMAS scores of the control group and the MMAS scores of the intervention group.

Approach to assess intervention adherence may use *self-report*, *pill counts*, pharmacy records, drug levels. Measurement uses patient *self-report* is more concise, quicker and easier to use, but the drawback is more subjective (Cook *et al,* 2005; Garber *et al.*, 2004). Currently, a more effective way in more effective measurement has been developed to evaluate the adherence, namely the new 8-item self-report Morisky Medication Adherence Scale (MMAS) (Morisky, *et al.*, 2008; Garber, *et al*, 2004).

Many factors have been reported can affect lower adherence in the patients, for example the factors of negligence, depression, the lack of the patients knowledge about hypertension and its intervention, clinical condition (TD) which is already improved makes the patients decide stopping their intervention, the drugs' side effect, economic factor, as well as excessive prescribing which makes the patients feel tired to take their medication and the patients' life quality themselves.

MMAS provides information on the habits associated with low adherence that may be caused by the coincidence (e.g. negligence), accidentally (not taking medication when feel it getting worse or improved). Table III shows some patients not adherent to therapy caused patients often forget to take the medication and understanding patients are wrong about their disease so that they deliberately not to take their medicine. Patients who do not comply assume that after a patient taking the drug antihipertensi

and there has been a decrease in blood pressure, patients feel the ailment had healed and do not need to take drugs again. Then patients will take drugs again when the symptoms of elevated blood pressure, for example pain in the back of the head or feel dizzy. Non-adherence in taking the drug also caused due to a lack of understanding about the risks that will happen if blood pressure patients aren't reach the target set.

The low adherence becomes a challenge for pharmacists and clinicians in the future to determine effective interventions. If pharmacists s is to identify patients who have adherence low, so pharmacists can intervene in an imprecise manner and appropriate. With a counseling pharmacists, the patient is given the understanding that the disease hypertension incurable and when his blood pressure not reach the target applied will damage occurs on vital organs other bodies.

3. Blood Pressure Assessment

Hypertension level was assessed at the beginning when the patients entering the research, which was measured by systolic blood pressure at the first control or disease intervention in PKU Muhammadiyah Bantul Hospital, Yogyakarta.

The results of the normality test using the *Kolmogorov Smirnov* concerning systolic blood pressure showed that both the control group and the intervention group at the beginning and in the end of the study were normally distributed (p>0.05). Thus, to examine the differences between the initial condition and the final condition of the study in both the intervention group and the control group, a parametric
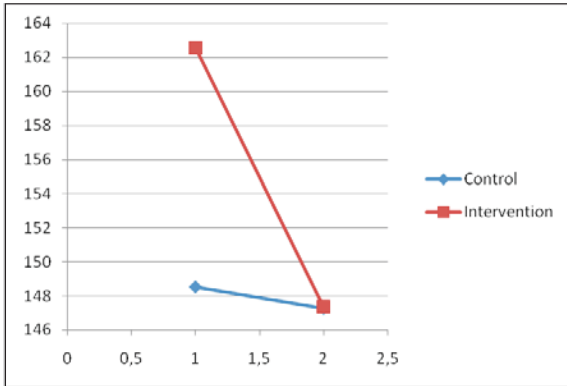
Piture 1. The mean of Systolic Blood Pressure at the Beginning and in the End of the Research of both the Control Group and the Intervention Group

Group	The Beginning	The End	P Value
Control	148.53	147.27	0.730
Intervention	162.57	147.37	0.000*

Description :

* : *Using Paired Samples t-Test*

statistical test with *Paired Samples t-Test* was administered. In accordance with the results of the test conducted in the intervention group, the p value of 0.000 (p<0.05) was obtained, meaning that there are significant differences in systolic blood pressure measurements at the beginning and in the end of the study. Whereas in the control group, the p value of 0.730 (p>0.05) was obtained, meaning that there is no significant difference in systolic blood pressure measurements during and in the end of the study.

The normality test on the mean of the SPB changes using the *Kolmogorov Smirnov* for systolic blood pressure showed that the data of both the control group and the intervention group were normally distributed (p>0.05), so as to know the difference between the control group and the intervention group, the parametric statistical test of *the Independent Samples t-Test* was conducted. The test results generated the p value of 0.008 (p<0.05). Therefore, it can be concluded that the patients with hypertension in
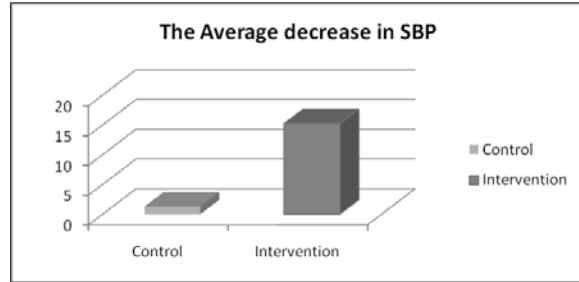

Picture 2. The average decrease in (Ä) Systolic Blood Pressure of the Patients with Hypertension of both the Control Group and the Intervention Group at the Beginning and in the End of the Research

Group	The average decrease in (Δ) SBP (mmHg)	P Value
Control	1.27	0.008*
Intervention	15.2	

SBP : Systolic Blood Pressure

* Using *Independent Sampels t-Test*

the intervention group (that were facilitated with pharmacist counseling and booklets) encountered more significant systolic blood pressure decreases than the control group.

4. Assessment Correlation the result of terapy with Adherence

The correlation test in to analyze the correlation between the result of the terapy with adherences. The result of therapy which is correlated with adherence is reduction of blood pressure systolic with MMAS category. Statistical correlation test was Spearman test. This test was chosen because the variables are tested in the form of rasio with ordinal variables and were not normally distributed.

The results of this test showed significant correlation between decreasing systolic blood pressure with MMAS score of pharmacist patient with hypertension who become research in internal disease polyclinic in PKU Muhammadiyah Bantul Hospital, Indonesia. This is an accordance with the condition expected, namely a significant relationship

Tabel IV. The Corelation of changes of SBP with a MMAS category of patient hypertension in PKU Muhammadiyah Bantul Hospital.

Blood pressure	MMAS score		Conclussion
	Value P	Value P	
Changes of Systolic blood pressure	0.024	0.410	There is strong significant correlation, the power of correlation weak, the direction of the positive correlation

between reduction results therapy with MMAS score, although the correlation coefficient showed a weak relationship. This matter could probably cause counseling pharmacist is not dominant as a factor of decreasing systolic blood pressure. The direction of correlation is positive, which means the greather the difference in a person's blood pressure will be higher his MMAS score.

CONCLUSION

1. Pharmacist counseling and booklets had a positive and significant effect (p=0.001) on adherence of ambulatory hypertension patients in internal disease polyclinic in PKU Muhammadiyah Bantul Hospital, Indonesia

2. Compliance has a positive and significant (p=0.024, r=0.410) for systolic blood pressure reduction so that the higher the level of patient compliance, the greater the decrease in blood pressure.

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