Prolanis Influence on Decreasing Blood Pressure of Hypertension Patients in *Puskesmas* Pandak II Bantul 2017

Florentina Sita Murti[1], Hari Kusnanto J[2], Wahyudi Istiono[2]

[1] *Puskesmas* Imogiri I Bantul; Yogyakarta; Indonesia
[2] Department of Family and Community Medicine; Faculty of Medicine, Public Health, and Nursing; Universitas Gadjah Mada; Indonesia

Corresponding Author:
Florentina Sita Murti: Puskesmas Imogiri I, Jl. Ngancar Karangtalun, Karangtalun, Barepan, Karangtalun, Kec. Imogiri, Kabupaten Bantul, Yogyakarta - 55782, Indonesia
Email: fsitamurti@gmail.com

ABSTRACT

Background: People with hypertension over age 25 years reached 40% in 2008 according to the World Health Organization and 75% occurred in developing countries. Hypertension management must be focused on first-rate health care which could reduce death-risk, disabilities, and the cost burden. *Badan Pengelola Jaminan Social* obliges every first-rate health care to have to apply *Program Pengelolaan Penyakit Kronis* (*Prolanis*). **Objective**: This study aims to determine the difference of decreased blood pressure in *Prolanis* and *Non-Prolanis* groups in *Puskesmas* Pandak II. **Methods**: This quantitative research with cohort retrospective design used secondary data of hypertension patients who are following *Prolanis* compared with those who are not in *Puskesmas* Pandak II. Data covered characteristics of patients, blood pressure, and Body-Mass Index over one year. The analysis used repeated measures of ANOVA. **Results**: The comparison with the treatment group showed significant differences in blood pressure variables, interaction and measureable differences during the study period in all three variables. There was an uptrend in the *Non-Prolanis* group and a downtrendin the *Prolanis* group. **Conclusions**: Decreased blood pressure of patients with hypertension is better in *Prolanis* than *Non-Prolanis* groups. Chronic disease prevention programs can benefit by appling *Prolanis* protocols to achieve greater public health outcomes.

Keywords: decreased blood pressure, hypertension, Prolanis

INTRODUCTION

According to the World Health Organization (WHO), the incidence of hypertension over age 25 in the world was 40% in 2008. Hypertension complication is about target organs which are the heart, stroke, kidney failure, and associated disabilities. The complication can increase morbidity and mortality of the patients. Deaths due to cardiovascular diseases reach more than 17 million every year in the world with 9.4 million because of hypertension complication[1]. The results of Basic Health Research/*Riset Kesehatan Dasar* (*Riskesdas*) 2013 show the prevalence of hypertension was 26.5%[2]. In *Puskesmas* which are in Bantul Regency including *Puskesmas* Pandak II, the hypertension visits increased threefold in the years 2010 - 2015[3].

75% of hypertension cases are happening in developing countries and most often found in first-rate health facilities. The hypertension complication involve target organs which are heart diseases, stroke, kidney failure, and disabilities, and cause increased morbidity and mortality patients of hypertension. The complication occurs due to to high blood pressure and the extended duration of uncontrolled blood pressure. Decreased systolic blood pressure can decrease fatal events because of ischemic heart diseases and stroke. An estimated 10% of health financing is dedicated for the treatment of hypertension and its complications[4,5].

Hypertension is included among non-communicable diseases which are often chronic and require continuous

and lifelong management. Indonesia needs to do a review to improve the national health system to be more effective and affordable to prevent and control non-communicable diseases including hypertension through cost-saving interventions and a more structured approach to providing primary care services for quality and equality. The management of hypertension needs to be focused on expensive tertiary-level health services to provide more effective primary health services to reduce the risk of death as well as disability from complications of hypertension[6]. Primary health facilities are expected to provide a package of programs that include hypertension prevention and control consisting of pharmacological and non-pharmacological therapies[7,8].

Indonesia applied National Health Insurance/Jaminan Kesehatan Nasional (JKN) system since from 2014[9]. Social Security Management Institution/*Badan Penyelenggara Jaminan Sosial* (*BPJS*) is an institution which is given authority from the government to organize health insurance program for all people. *Prolanis* is a program which is held by *BPJS*. The aim of *Prolanis* is to encourage the participation of chronic disease patients to reach the optimal of life quality with the indicator that 75% participants are registered persons visiting a first-rate health facility have "good" result on hypertension examination so it could prevent complications of diseases. *Prolanis* activities are expected to achieve optimal quality of life with the effective cost and efficient health. The activities that are held in *Prolanis* class include medical consultation with giving the medicine for 1 month, group education, a reminder through SMS gateway, home visit, club activity, and monitoring health status. The steps of *Prolanis* are: doing verification for suitability of the diagnostic data with the willingness format provided by the prospective *Prolanis* participants; distribute the health status monitoring books for the *Prolanis*; do data recapitulation and participant data entry; *BPJS* with the health facilities do data recapitulation on the health status of the participants; do the monitoring of *Prolanis* activities on each health facility, give list of drug providers (pharmacy) and joint efforts with *BPJS* on providing prescribed drug for *Prolanis* members[10].

Since 2014, *Puskesmas* Pandak II has conducted the activities for *Prolanis*. The hypertension class has 32 members. Routinely *Prolanis* implementation is held every month and reported to *BPJS*. Operational funding for *Prolanis* is from *BPJS* with a claim submission system. *Prolanis* implementation in *Puskesmas* Pandak II has not evaluated the result before including the success of the blood pressure management for hypertension patients.

Based on background description, this research aimed to answer the question: Is there any difference between *Prolanis* group and *Non-Prolanis* group in blood pressure decrease in patients with hypertensive in *Puskesmas* Pandak II.

To know the difference of decreasing blood pressure on hypertensive patients who are followed *Prolanis* for one year before the research time we compared medical records with hypertensive patients who have not followed the *Prolanis* activities in *Puskesmas* Pandak II.

RESEARCH METHODS

The research was a quantitative study that compared patients who had already followed *Prolanis* for 1 year before the time of the research with hypertensive patients who were not following *Prolanis* in *Puskesmas* Pandak II.

The population of this study includes hypertensive patients of *Prolanis* group and *Non-Prolanis* group patients who have visited *Puskesmas* Pandak II every month for 12 months in the year of 2016 until 2017.

The subjects of the research of *Prolanis* group consisted of 32 patients whowere enlisted with census method or total sampling. The *Non-Prolanis* group (control) included hypertensive patients who have visited *Puskesmas* Pandak II with similar characteristics or comparable with the hypertensive patients in the *Prolanis* group. After obtaining sufficient number, then simple random sampling was done to reach the control group with 32 people, which was half the number of the *Prolanis* group which included 64 patients[11,12].

This research used secondary data and the instruments used were recorded data which were derived from the patients' medical record. Medical record data collected included the characteristics of patients, blood pressure consisting of systolic and diastolic pressure and Body Mass Index (BMI).

Repeated measures ANOVA statistic tests were used to measure the difference in the decrease of blood pressure and BMI in the *Prolanis* and *Non-Prolanis* groups.

RESULTS

From 96 research subjects, the result of the univariate analysis showed that 11.46% are men and 88.54% women and average ages of *Prolanis* and *Non-Prolanis* groups are similar with 52.5 years old, with standard deviation ±7.31. This is supported by data obtained that *Puskesmas* Pandak II patient visitation is predominantly female with 61.55%[13]. *Riskesdas* results for 2013 showed that hypertension prevalence of females is higher than males. High risk of hypertension is caused by the changes in the structure of large blood vessels, so the lumen becomes narrower and the walls of blood vessels become more rigid which will increase systolic blood pressure[14]. The research of Tuminah and Rahajeng about hypertension prevalence and the determinants in Indonesia showed that the age factor is a risk to hypertension. With the increasing age of the respondents comes the higher risk of hypertension. In the age of 25-44 years old, the hypertension prevalence is 29%, in the age 45-64 years old is 51% and in the age >65 years old is 65%[15].

Mean value of systolic pressure in *Prolanis* group is 140.57 mmHg with standard deviation ±12.41. Meanwhile *Non-Prolanis* group has a mean value of systolic pressure that is about 148.56 mmHg with standard deviation ±14.28. The mean value of diastolic pressure for *Prolanis* group was 87.49 mmHg with standard deviation ±5.22, while *Non-Prolanis* group, the mean value for diastolic pressure was

91.16 mmHg with standard deviation ±14.28. Mean value of BMI in *Prolanis* group is 26.61 kg/m² with standard deviation is ±4.55. Meanwhile in *Non-Prolanis* group, mean value BMI was 27.51 kg/m² with standard deviation ±2.64.

Data analysis used *repeated measures* ANOVA to see the difference of decreased blood pressure among the group treatments (*Prolanis* and *Non-Prolanis*).

The comparison between the treatment groups showed a significant difference in the blood pressure variable with *p-value* <0.05 (table 1).

Table 1. Test differences between treatment groups in the study subjects

No	Variable	F count	F table	P-value
1	Systolic pressure	23.377	161	0.0001
2	Diastolic pressure	32.568	161	0.0001
3	Body mass index	0.917	161	0.341

Comparison between time measurements showed a significant difference in diastolic pressure and body mass index from the first month until the twelfth month. This is shown with the *p-value* <0.05 (table 2).

The difference interaction between treatment groups and time measurements has a significant difference in the three variables with a *p-value* <0,05 (table 3).

**Table 2. Test the difference between time measurements**

No	Variable	F count	F table	P-value
1	Systolic pressure	0.798	1.88	0.642
2	Diastolic pressure	2.127	1.88	0.027
3	Body mass index	6.961	1.88	0.0001

Table 3. Test interaction between time measurements and group treatments

No	Variable	F count	F table	P-value
1	Systolic pressure	1.985	1.88	0.040
2	Diastolic pressure	2.478	1.88	0.010
3	Body mass index	4.197	1.88	0.0001

From table 1,2 and 3 showed the uptrend in *Non-Prolanis* group and downtrend in *Prolanis* group.

Trend differences can be explained by the picture below:
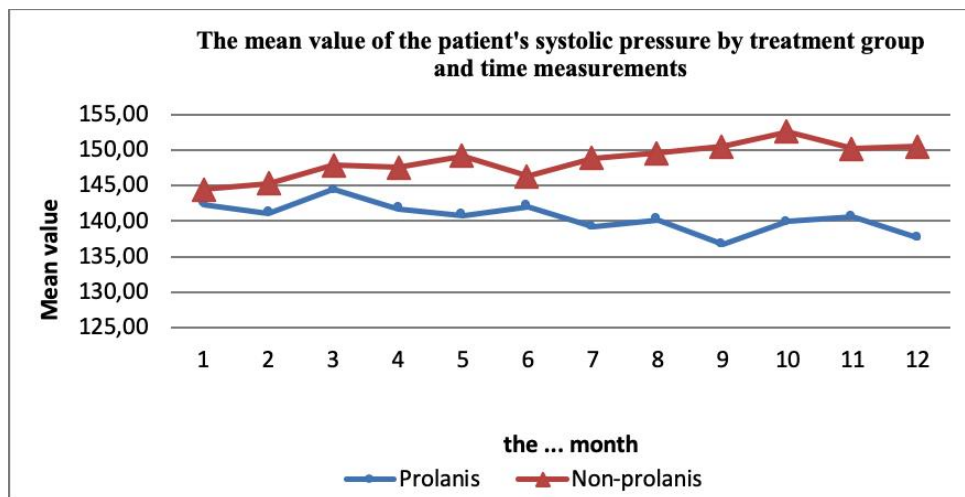
Figure 1. The mean value of the patient's systolic pressure based on treatment group and time measurements

Analysis result showed the uptrend of the blood pressure and body mass index in *Non-Prolanis* group and downtrend of blood pressure and BMI in *Prolanis* group. From the graph of patient data, the average value of patient's systolic pressure, diastolic pressure, and body mass index based on treatment group and time measurements appears that the blood pressure and body mass index from Non *Prolanis* group and *Prolanis* group is getting widely divergent.

Graph of *Non-Prolanis* group shows them moving away from therapeutic targets while data from *Prolanis* group is decreasing toward their therapeutic target. In the twelfth month, it appears that average blood pressure has been on the target. Research by Morisky D et al. who observed health education intervention for 5 years, visits to the patients' home, and medical consultation on hypertensive patients who received regular care in the first two years
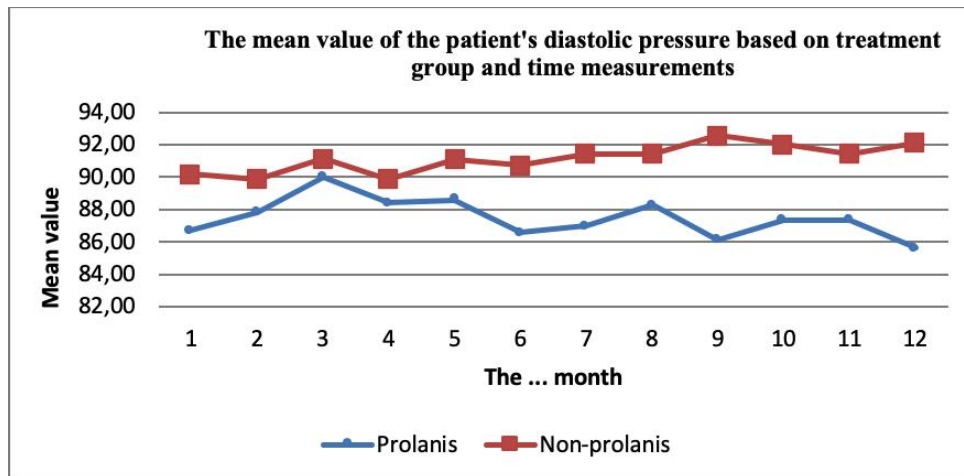
Figure 2. The mean value of the patient's diastolic pressure based on the treatment group and time measurements
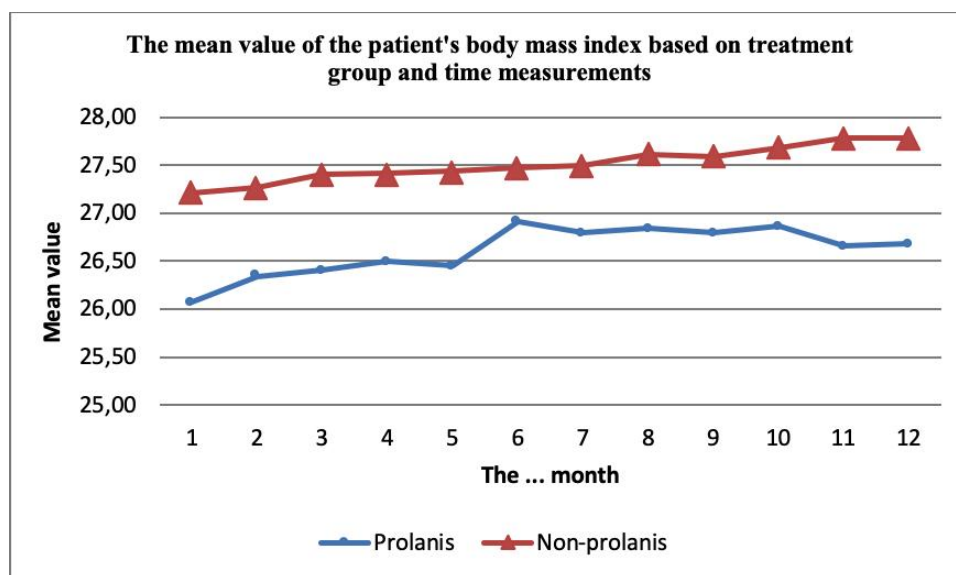

Figure 3. Mean value of the patient's body mass index based on the treatment group and time measurements

also showed positive effect from education programs on adherence to medical care and blood pressure control on hypertensive patients who received intervention. Analysis of five years showed a continuing positive effect on the regularity of the visits of medical care, weight control, and blood pressure control[16].

DISCUSSION

The research conducted by Shayesteh et al. showed the relationship between lifestyle and hypertensive. Lifestyle includes an education program in the field nutrition, physic activities, and stress management are crucial for the improvement of disease knowledge and behavior modification among hypertensive patients. For the mean value of body mass index, *Prolanis* group and *Non-Prolanis* group are still above the target 25 kg/m^2. BMI is significant and having positive correlative with systolic and diastolic blood pressures[17].

The healthy lifestyle has been shown to lower blood pressure and is beneficial in reducing the risk of cardiovascular problems. A healthy lifestyle which is recommended by

some *guidelines* includes weight loss, exercise, decreased salt intake, decreased alcohol consumption and smoking cessation[18].

The research which was conducted by Yan et al. about hypertensive management in rural primary care facilities at Zambia with system international *Better Health Outcomes through Mentoring and Assessment* (BHOMA) showed that 12.9% hypertensive patients with controlled blood pressure at 6 months after intervention, then it increased gradually about 25% in 48 months after intervention. But the rate of change does not increase. BHOMA system applies some of the programs that are also applied in *Prolanis*[19].

The advantages from this research are taking the subjects from all active *Prolanis* members for 12 months accompanied by complete monitoring data which included blood pressure and BMI measurement every month. Also, the control group was conveniently sampled, an i.e *Non-Prolanis* group that are similar in the characteristics with *Prolanis* group.

The disadvantages of this research are:

1. The number of research subjects for *Prolanis* group is under the number of subjects that should be used due to the limitations *of Prolanis* members which is only 32 members. So, in this study, the subjects of the control group amounted to double the number of *Prolanis* group walthough the characteristics in the two groups are similar.
2. Risk factors such as comorbidities which could be monitored in the occurrence of hypertension had no data because the medical records did not record it.
3. The researcher also could not monitor the quality of participation of the subject researchers in *Prolanis*
4. Finally, there were imitations on the validity of the measurement tools (cuffs, scales, calibration of blood pressure gauges.

CONCLUSIONS

Blood pressure control on hypertensive patients in *Prolanis* group is better than *Non-Prolanis* group. This is shown with the following findings: (1) There was a significant different in interaction within treatment group and time measurements in variable systolic and diastolic pressures; (2) There was a significant difference within the tendency of decreased systolic and diastolic pressure on *Prolanis* group compared with *Non-Prolanis* group; and (3) BMI variable also showed a significant difference in interaction and tendency of decreased BMI in the *Prolanis* group compared with the *Non-Prolanis* group.

Suggestions:

1. Target audience coverage of *Prolanis* members should be enhanced by an effective communication approach so hypertensive patients interested in joint with *Prolanis* group.
2. Information should be given about risk factors of non-communicable diseases including hypertensive patients in every medical record patient.
3. There is need for evaluation of the *Prolanis* implementation periodically.
4. *BPJS* should provide hypertensive medicines for JKN members who do not join *Prolanis* routine for 1 month similar to *Prolanis* group members.
5. *Prolanis* can become one form of community empowerment in the field of health which does not only depend on *Puskesmas* but alos other primary service facilities.
6. *Puskesmas* should have basic data of hypertensive patients in their area to be the object of monitoring and monitoring evaluation of management hypertension.
7. More stakeholders in the villages need to be involved in planning and budgeting hypertension management in their area.

Ethical Approval and Informed Consent

This research has been approved by The Medical and Health Research Ethics Committee (MHREC) from Faculty of Medicine, Universitas Gadjah Mada, Yogyakarta with reference number KE/FK/0721/EC/2017.

Availability of Data and Material

Data and material can be accessed via corresponding author.

Conflict of Interest

None.

REFERENCES

1. World Health Organization. How public health stakeholders can tackle hypertension. A Global Brief on Hypertension. Geneva: WHO. 2013.
2. Agency For Health Research And Development. Basic Health Research2013. National report. 2013:1-384.
3. Bantul Health Office. Bantul regency health profile in 2016. Bantul: Bantul Health Office. 2016.
4. Campbell NR, Khalsa T, World Hypertension League Executive: Lackland DT, Niebylski ML, Nilsson PM, Redburn KA, Orias M, Zhang XH, International Society of Hypertension Executive: Burrell L. High blood pressure 2016: why prevention and control are urgent and important. The World Hypertension League, International Society of Hypertension, World Stroke Organization, International Diabetes Foundation, International Council of Cardiovascular Prevention and Rehabilitation, International Society of Nephrology. The Journal of Clinical Hypertension. 2016 Aug; 18(8):714-7.
5. James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, et al. 2014 evidence-based guideline for the managementof high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). Jama. 2014 Feb 5;311(5):507-20.
6. Sanyoto DV, Syah NA. The Role of Primary Care Physicians (DLP) in community care. Review of Primary Care Practice and Education (Kajian Praktik dan Pendidikan Layanan Primer);1(1):3-5.
7. Schröders J, Wall S, Hakimi M, Dewi FS, Weinehall L, Nichter M, et al. How is Indonesia coping with its epidemic of chronic noncommunicable diseases? A systematic review with meta-analysis. PloS One. 2017 Jun 20; 12(6):e0179186.
8. Kosasih H. Clinical pathophysiology. Jakarta: Binarupa Aksara. 2013.
9. Ministry of Health Republic of Indonesia. Health insurance system. Available from: http://www.depkes.go.id/article/view/13060100016/sosialisasi-jaminan-kesehatan-nasional.html.2014
10. Health Social Guarantee Organizing Agency. *Prolanis* (chronic disease management program) practical guide. Jakarta: Health Social Guarantee Organizing Agency. 2014.
11. Lemeshow S, Hosmer DW, Klar J, Lwanga SK. Adequacy of sample size in health studies (trans vers). Yogyakarta: Gadjah Mada University Press. 1997.
12. Dahlan MS. Sample size and method of sampling 3rd ed. Jakarta: Salemba Medika. 2010:29-30.
13. *Puskesmas Pandak II* Bantul. *Puskesmas Pandak II* Profile 2016. Bantul. 2016.
14. Kaplan NM. Hypertension in the population at large. Kaplan's Clinical Hypertension. 2002:1-24.
15. Rahajeng E, Tuminah S. Prevalence of hypertension and determinants in indonesia. Indonesian medical magazine. 2009 Dec; 59(12):580-7.
16. Morisky DE, Levine DM, Green LW, Shapiro S, Russell RP, Smith CR. Five-year blood pressure control and mortality following health education for hypertensive patients. American Journal of Public Health. 1983 Feb;73(2):153-62.

17. Shayesteh H, Mirzaei A, Sayehmiri K, Qorbani M, Mansourian M. Effect of education intervention on lifestyle of patients with hypertension among the rural population of Lorestan Province. Journal of Lifestyle Medicine. 2016 Sep;6(2):58.

18. Indonesian Heart Association. Guidelines for managing hypertension in cardiovascular diseases. Jakarta: Indonesian Heart Association. 2015.

19. Yan LD, Chirwa C, Chi BH, Bosomprah S, Sindano N, Mwanza M, et al. Hypertension management in rural primary care facilities in Zambia: a mixed methods study. BMC Health Services Research. 2017 Dec;17(1):111.