



The Effect of Self-reminder Card to the Level of Adherence of Hypertension Patients in Community Health Center in Surabaya

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Abstract

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BACKGROUND: Hypertension was an increase of blood pressure which caused damages on the target organs. Treatment therapy of hypertension patients was very complex and required a long period of time. Target of hypertension therapy was to keep the patient's blood pressure controlled. Achieved therapeutic target was increasing adherence of patient medication. The success of treatment was not only influenced by the quality of health care but also influenced by the patient's adherence to the treatment. Self-reminder card was a tool helping patients to avoid forget taking medicine.

AIM: The aim of this research was to determine the effect of self-reminder card on the level of adherence to treatment in hypertension patients in 10 community health centers (Puskesmas) in Surabaya.

METHODS: This research used QUASI experimental two groups pre-post prospective. Adherence measurement used Morisky, Green, Levine Adherence Scale questionnaire. The results of the questionnaire were analyzed statistically. Research was conducted in May 2020 at the community health center in Surabaya. Research criteria are patients with hypertension diagnosis without comorbid disease who get antihypertensive therapy.

RESULTS: The results of the study obtained 115 patients (55 control group patients and 60 intervention group patients). Statistical analysis using Mann-Whitney, there was a difference between the level of adherence to treatment in the control and intervention group with the value of $p < 0.001$. A test analysis using Wilcoxon signed-rank, there was a difference between the level of adherence to treatment before and after the intervention group with the value $p < 0.001$.

CONCLUSIONS: Self-reminder card was effective in increasing the level of adherence to the treatment of hypertension patients.

Introduction

Hypertension was a state of blood pressure increased which gave further symptoms of damages on a target organ such as stroke (occurred in the brain and caused high mortality), coronary heart disease (damages on the heart's blood vessels), narrowing left/left ventricle (occurred in the heart muscle), kidney failure (end-stage renal disease), diabetes mellitus, and others [1]. High blood pressure (hypertension) was major problems not only in Western countries but also in Indonesia. In Indonesia, hypertension patients estimated 15 million people, but only 4% was controlled hypertension. The prevalence of 6–15% in adults, 50% of them were unaware that they got hypertension because they did not recognize the symptoms and risk factors, so it was avoidable and became severe hypertension, and 90% were essential hypertension [2]. Clinical manifestations of the hypertensive disease were organ damages that caused heart and kidney disorders, stroke, and various other complications [3]. Therefore, one of the targets of hypertensive therapy was to keep the patient's blood pressure controlled to suppress the morbidity and

mortality rates. Various efforts were able to be made so that the therapeutic target of hypertensive patients was achieved, one of them through the pharmacy activities by pharmacist [4]. The pharmacy activities were aimed to increase the adherence of patients in taking the medication so that the therapeutic target was achieved.

It took considerable effort to increase patient's adherence to treatment to achieve the targeted blood pressure. A study stated that patients who discontinued their anti-hypertension therapy were possibly five times bigger getting stroke [5]. According to the World Health Organization report, the average patient's adherence of long-term therapy of chronic diseases in the developed countries was 50%, and in developing countries was estimated lower [6]. The success of treatment was not only influenced by the quality of health care, attitudes and skills of health workers, attitudes, and lifestyles of patients and their families but also influenced by the patient's adherence to treatment [7].

Non-compliance with treatment therapy is a factor that can affect the effectiveness of therapy, namely blocking blood pressure control, especially in hypertensive patients, thus it required intervention to improve

therapeutic adherence [8]. One of the interventions given by pharmacist that was able to improve patient's adherence was using self-reminder card. Self-reminder card was a tool helping patients to avoid forget taking the medicine by marking the column available on the medication reminder chart after taking medicine [9]. Self-reminder card was the development of a self-service reminder card of taking medication on guidelines of pharmacy services counseling in health facilities (Pharmaceutical Services Counseling Guidelines in Health Facilities) issued by the Indonesian Ministry of Health in 2017 and other similar researches. Development of self-reminder card in this research equipped with tools in the form of the picture of rules for taking medicine which was expected to improve the patient's understanding of the schedule of drug taking. Self-reminder card was designed by researchers as the identity of patient treatment that was easy to be carried out when traveling because it contained a history of the patient's treatment, so it helped the doctor in prescribing treatment for the patient [10].

The measurement of adherence to the treatment using questionnaires had advantages, namely practical, cheap, and efficient [11]. The adherence measurement in this research used Morisky, Green, and Levine Adherence Scale (MGLS) questionnaire which had previously been translated into Indonesian language and had been tested for validation and reliability [12]. MGLS questionnaire was a questionnaire used to measure adherence using four questions. These questions described level of patient's adherence which was categorized into three, namely high adherence, moderate adherence, and low adherence that had previously been translated into Indonesian language version and had been tested and validated for validation and reliability.

Puskesmas (community health center) was a first-level health facility, so it was a key promotion and preventive program in supporting the successful of patients' therapeutic treatment. Surabaya had 61 community health centers spread in several regions so that the community health center in Surabaya also played an important role. Therefore, it was necessary to conduct a research to know whether self-reminder card given affected the level of adherence in taking medication in hypertension patients in community health centers of Surabaya or not. The results of this research hoped could be a reference to support the pharmacy services conducted in Community Health Center (Puskesmas) and also the development of science in the pharmacy field, especially to improve the adherence of taking medication of hypertension patient.

Methods

Study design

Subjects used in this study were all patients diagnosed hypertension and got antihypertensive drug

therapy which was in accordance with the research criteria.

Inclusion criteria

The following criteria were included in the study:

1. Patients (aged 20–80 years) diagnosed hypertension without comorbidity which got anti-hypertensive drug therapy
2. Patients which had complete data (medical record and prescription medications)
3. Patients visited community health center at least 2 visits
4. Patients who were willing to be contacted through WA (what application social media).

Exclusion criteria

The following criteria were excluded from the study:

1. Children
2. Incomplete patient medical record data
3. Pregnant patients.

Drop out criteria

1. Patients who had included into inclusion criteria but dropped out at a predetermined time
2. Patients who had included into inclusion criteria that changed the drug therapy regimen.

Data Sources and Measurement

Primary data obtained by completing the MGLS pre-post questionnaire through a Google form link that had been tested for validation and reliability with the value of p was lower 0.05 and KR-20 was equal to 0.6612. It was accompanied with a reminder call in the control group and the intervention.

There are two groups in this study:

1. Self-reminder card group
2. Control group.

Research treatment: Subjects are given a pre-questionnaire through Google form then explained how to use "Self Reminder Card" to the subject then 1 month later conducted a questionnaire interview post-research through Google form.

MGLS questionnaires consisted of four questions which described patients adherence into three categories, namely high adherence (score 0), moderate adherence (score 1–2), and low adherence (score 3–4).

Statistical methods

To find out the effects of self-reminder card on the level of patient adherence and the success of anti-hypertensive drugs therapy, it was conducted in pairs analysis if the data result was not distributed normally using paired t-test sample (Wilcoxon). Statistical analysis in this study was conducted using SPSS Software 23.

Ethical considerations

Before the commencement of the study, approval of Health Research Ethics Commission was obtained from the University Airlangga, Faculty of Public Health with No. 94/EA/KEPK/2020 and approval from the patient using the consent form.

Results

Sample

The sample data on this study were 115 patients by considering inclusion and exclusion research criteria, which were divided into 2, namely, control groups (55 patients) and interventions (60 patients) given self-reminder card. The data presented in Table 1.

The percentage of each sociodemographic factor (baseline characteristics) to the level of adherence to medication was shown in Table 2.

The descriptive result of level and median value of adherence to medication in hypertensive patients was measured using MGLS shown in Tables 3 and 4.

Statistical analysis to determine the effect of self-reminder cards on the level of adherence to the treatment of hypertensive patients in the control group and the intervention group shown in Table 5.

Discussion

Adherence defined as a behavior of a person who got treatment, did diet and had a healthy lifestyle as recommended by health-care provider [13]. Clinical manifestations of hypertensive disease were organ damages that caused heart and kidney disorders, stroke, and various other complications [3]. Treatment of degenerative diseases such as hypertension required routine therapeutic treatment [14], [15]. Long-term use of drugs made patients experiencing psychological problems, namely boredom. It triggered disobedience in taking medication. Patient adherence was necessary to achieve successful therapy, especially noncontagious therapy such as hypertension [16], [17]. The success of treatment in hypertensive patients was influenced by several factors, one of them was adherence in taking medicine so that hypertensive patients were able to control blood pressure within normal limits [18].

Table 1: Demographics sample research

Baseline characteristic	Baseline Control (n total = 55)			Before Intervention (n total = 60)			After Intervention (n total = 60)		
	High level of adherence (Score 0) n (%)	Moderate adherence level (Score 1-2) n (%)	Low adherence level (Score 3-4) n (%)	High level of adherence (Score 0) n (%)	Moderate adherence level (Score 1-2) n (%)	Low adherence level (Score 3-4) n (%)	High level of adherence (Score 0) n (%)	Moderate adherence level (Score 1-2) n (%)	Low adherence level (Score 3-4) n (%)
Gender									
Woman	1 (2)	9 (16)	33 (60)	4 (7)	29 (48)	16 (27)	37 (62)	11 (18)	1 (2)
Man	2 (4)	1 (2)	9 (16)	1 (2)	6 (10)	4 (7)	10 (17)	1 (2)	0
Age (years)									
30-39	0	0	2 (4)	1 (2)	1 (2)	1 (2)	3 (5)	0	0
40-49	0	2 (4)	12 (22)	1 (2)	4 (7)	2 (3)	6 (10)	2 (3)	0
50-59	1 (2)	3 (5)	11 (20)	7 (12)	15 (25)	3 (5)	20 (33)	5 (8)	0
60-69	2 (4)	5 (9)	11 (20)	2 (3)	7 (12)	5 (8)	11 (18)	3 (5)	0
>70	0	0	6 (11)		4 (7)	5 (8)	7 (12)	3 (5)	0
Education									
No School	0	0	0	0	0	1 (2)	0	1 (2)	0
Elementary School	1 (2)	1 (2)	9 (16)	1 (2)	23 (38)	7 (12)	30 (50)	1 (2)	0
Junior high school	0	1 (2)	13 (24)	1 (2)	10 (17)	5 (8)	6 (10)	10 (17)	0
Senior High School	0	7 (13)	4 (7)	3 (5)	6 (10)	2 (3)	10 (17)	1 (2)	0
Bachelor	3 (5)	1 (2)	3 (5)	1 (2)	0	0	1 (2)	0	0
Occupations									
Not working	1 (2)	1 (2)	1 (2)	0	4 (7)	2 (3)	5 (8)	1 (2)	0
Housewives	2 (4)	7 (13)	27 (49)	7 (12)	19 (32)	3 (5)	27 (45)	2 (3)	0
Employees	0	0	7 (13)	0	5 (8)	5 (8)	8 (13)	2 (3)	0
Labor	0	0	2 (4)	0	0	1 (2)	0	1 (2)	0
Farmers	0	0	0	0	4 (7)	0	4 (7)	0	0
Teacher	1 (2)	1 (2)	0	0	0	0	0	0	0
Traders	0	0	3 (5)	0	7 (12)	5 (8)	9 (15)	1 (2)	0
Retired	0	0	2 (4)	0	0	0	0	0	0
Length of diagnosed hypertension (years)									
<1	1 (2)	1 (2)	3 (5)	0	10 (17)	1	10 (17)	0	0
1-5	7 (13)	2 (4)	26 (47)	7 (12)	29 (48)	4 (7)	36 (60)	4 (7)	0
6-10	0	0	9 (16)	2 (3)	3 (5)	2 (3)	6 (10)	1 (2)	0
11-20	0	0	3 (5)	0	1 (2)	0	0	0	1 (2)
>20	0	0	1 (2)	1 (10)	1 (2)	0	1 (2)	1 (2)	0
Types of treatment									
Monotherapy	4 (7)	5 (9)	36 (66)	12 (20)	38 (63)	7 (12)	47 (78)	10 (17)	0
Combination therapy	1 (2)	3 (5)	6 (11)	1 (2)	0	2 (3)	1 (2)	2 (3)	0

Table 2: The level of adherence to the medication of hypertensive patients seen from the factors of the patient's characteristics

Patient characteristics	Group			
	Control (n = 55)		Intervention (n = 60)	
	n	%	n	%
Gender				
Women	43	78	49	82
Man	12	22	11	18
Age (years)				
30–39	2	3.64	3	5
40–49	14	25.45	8	13.30
50–59	15	27.27	25	41.70
60–69	18	32.73	14	23.30
>70	6	10.91	10	16.70
Education				
No school	0	0	1	2
Elementary school	11	20	31	51
Junior high school	14	25.45	16	27
Senior high school	22	40	11	18
Diploma	1	1.82	0	0
Bachelor	7	12.73	1	2
Occupations				
Not working	3	5.45	6	10
Housewife	36	65.45	29	48
Employees	7	12.73	10	17
Labor	2	3.64	1	2
Farmers	0	0	4	7
Teacher	2	3.64	0	0
Traders	3	5.45	10	17
Retired	2	3.64	0	0
Length of diagnosed hypertension (years)				
<1	5	9.09	10	16
1–5	35	63.64	40	67
6–10	11	20	7	12
11–20	3	5.45	1	2
>20	1	1.82	2	3
Types of treatment				
Monotherapy	45	82	57	95
Combination therapy	10	18	3	5

Patient adherence to medication measured using various methods; one of the methods was a questionnaire. Measuring the level of adherence to medication using a questionnaire had advantages, namely practical, inexpensive, and efficient [11], [12].

Table 3: Level of adherence to medication of hypertension patient

Group	Adherence level category	Number of patients	
		Pre n (%)	Post n (%)
Control	High	3 (5)	5 (9)
	Middle	20 (35)	9 (16)
	Low	34 (60)	43 (75)
Intervention	High	9 (16)	43 (77)
	Middle	33 (59)	13 (23)
	Low	14 (25)	0 (0)

The adherence measurement in this research used MGLS questionnaire. MGLS questionnaire was a questionnaire used to measure adherence using four questions.

Table 4: Median value of adherence to medication score of hypertension patient

Group	Median value
Pre-intervention group	1.5
Post-intervention group	0
Pre-control group	3
Post-control group	3

These questions described level of patient's adherence which was categorized into three, namely, high adherence, moderate adherence, and low adherence that had previously been translated into Indonesian language version and had been tested and validated for validation and reliability.

Table 5: The effect of self-reminder card on adherence to medication of hypertension patients

Analysis statistic	p-value
Pre-post intervention group (Wilcoxon signed-rank test)	<0.001
Control group versus intervention group (Mann-Whitney test)	<0.001

From these four questions, if the answer was "yes," the score was 1, while if the answer was "no," the score was 0. The level of patient adherence using the MGLS questionnaire was divided into three categories, including high adherence with total (score 0), moderate adherence (score 1–2), and low adherence (score 3–4) [19]. Before collecting the data, validation and reliability tests were performed on 30 patients with values $p < 0.05$ and KR-20 was equal to 0.6612.

Based on the result of the research, it obtained 115 research patients by considering the criteria for inclusion and exclusion of the research, which was divided into two control groups (55 patients) and interventions (60 patients) given self-reminder card (Table 1). The majority of patients from both the control group and intervention were women (control group was 78% and the intervention group was 82%) (Table 1). Gender was a factor that affected patient's adherence to medication since gender was associated with different life roles and behaviors between men and women in society. In terms of maintaining health, women usually pay more attention to their health than men. In the other hand, the difference in pain behavior patterns was also influenced by gender [20]. Patient adherence level based on gender factor, the majority of women in the control group with low adherence was 60% and intervention group was 48% (Table 2).

Based on the characteristics of the patient age, the age range was 50–59 years (control group was 27.27% and intervention group was 41.70%) and 60–69 years. The level of adherence based on characteristic factors in the control group, the majority ages of 40–69 years, was 62% which was low adherence. In the majority intervention group at the age range of 50–59 years was 25% which was moderate adherence (Table 2). Age factor was a determining factor of non-adherence in the treatment because those who were young or elder had a motivation to live healthy lifestyle and always pay attention to health [20].

Basic patient's characteristics based on education, junior high school was the majority (40%) for the control group, and elementary school was 51% for the intervention group (Table 1). The level of adherence was seen from the education factor of the control group with a low adherence rate of 24%, the intervention group with moderate adherence of 38% (Table 2). Higher educated respondents had a wider knowledge compared to respondents whose level of education was low so that it affected the behavior of healthy living and the adherence of educated respondents was higher [21]. Based on the research of Boima *et al.*, the study stated that higher education would be more obedient 85% compared with 15% disobedient [22].

Based on occupation characteristics, the majority of housewives, the control group was 65.45% and the intervention group was 48% (Table 1). The level of adherence of housewife was low (49%) for the control group and moderate (32%) for the intervention

group (Table 2). Occupation was something that took time to support life, so people had occupation tended to have limited time. Research by Cho and Kim stated that occupation had a significant connection with non-adherence with the use of antihypertensive ($p = 0.006$) because it was influenced by different types of occupation and duration of work hours [23].

The patient's characteristics based on the length diagnosed hypertension; the majority of both the control group and the intervention were 1–5 years (Table 1). Research other conducted showed that non-adherence affects an important proportion of patients in the treatment of arterial hypertension. Young age was a particularly important risk factor for non-adherence, and this patient population is, therefore, in need of special attention. Modifiable risk factors were identified that could help improving the treatment of arterial hypertension and potentially other chronic conditions [24]. This was comparable to this research result that the majority of low adherence levels (47%) in the control group and moderate adherence level (48%) in the intervention group (Table 2).

The type of majority treatment in the study was monotherapy, namely, the control group (82%) and intervention group (95%) (Table 1). This was not proportional to the results of this study that patients who got the type of monotherapy treatment in the control group had low levels of adherence (66%) and intervention groups with moderate adherence levels (63%) (Table 2). Use single antihypertensive (monotherapy) is known to be improved patient adherence in the use of the drug [25].

The level of adherence with hypertensive patients on the control and intervention group, based on descriptive analysis, stated that the control group was a low adherence level (60%) and pre-intervention group (before the self-reminder card treatment) was a moderate level of adherence (59%), then post (after being given a self-reminder card treatment) increased to a high level of adherence (77%) (Table 3). It showed descriptively that self-reminder card increased adherence of hypertension patient in taking medication. Median value of drug-taking compliance levels in hypertensive patients in the pre-intervention group with moderate compliance levels (score 1.5), post with high compliance rate (score 0). In pre-control groups with low compliance levels (score 3) and posts at low category fixed compliance levels (score 3) (Table 4).

Based on statistical analysis, it was known that the self-reminder card affected the level of adherence with hypertensive patients indicated from 2 control groups and interventions tested with Mann–Whitney test with the value of $p < 0.001$ test analysis of the Wilcoxon signed-rank of the pre-test data and post-test of the intervention group showed the value of $p < 0.001$ (Table 5). The results of the statistical analysis showed that a significant self-reminder card of intervention group was found to be a difference from

pre-test and post-test. The increasing of adherence in taking medicine supported the successful of therapy. A reminder card of medication was able to be used as an alternative intervention in the Ministry of Pharmacy so that the purpose of therapy for patients was able to be accomplished [26], [27], [28].

The weaknesses of this research were that there was no analysis of the factors affecting the low level of adherence to the medication of hypertensive patients such as dietary restrictions on the patient and the parameters in terms of blood pressure control. It was concluded that further research was able to be done by improving the adherence of taking medication toward the success of patient therapy in controlling blood pressure. The strength of this research is that this study provided self-reminder card intervention, this study has clear research inclusion criteria with patients diagnosed with hypertension without participation and pre-post measurements.

Conclusion

A self-reminder card was able to affect the level of adherence to the medication of hypertension patients, which was measured using MGLS questionnaire.

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