Improving Outpatient's Quality of Life via Patient Adherence of Antihypertensive Therapy Using "Mobile Phone (SMS) and Brief Counseling-5A" in Polyclinic of Internal Medicine at PKU Muhammadiyah Bantul Hospital, Yogyakarta

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Abstract
The Health-Related Quality of Life (HRQoL) is one of the important psycho-social characteristics that can affect patient's ability to manage therapy. Poor of knowledge of hypertension and the changing lifestyle can affect the quality of life of patients. One of the pharmacist's interventions in hypertension management is to conduct counseling. Motivational counseling helps health service to assess patient's understanding and patient's readiness to change patient's behavior. Some motivational counseling methods still need to be developed. Therefore, this study aims to find the influence of the "brief counseling-5A" and "motivational SMS" by a pharmacist on the quality of life and blood pressure control in hypertension patients in the internal disease polyclinic, PKU Muhammadiyah Bantul Hospital, Yogyakarta. The study has been done by using the quasi-experimental method with prospective data collection during the period of January until April 2013. Sixty patients have met inclusion criteria and were divided into two groups. Thirty patients (50%) received "brief counseling-5A" and "motivational SMS" as intervention group and the other thirty patients (50%) received usual care as a control group. The data collection was done by interviewing patients. Medication adherence and QoL were assessed by using Morisky Medication Adherence Scale (MMAS) and SF-36. The values of blood pressure are taken from patient's medical records. Patient's quality of life showed a good improvement during post study. It is shown in 8 different domains including pain, fatigue, physical function, emotional function, social function, role physical, mental health, and general health. In intervention group, physical function, emotional function, and pain showed highly significant improvement ($p<0.05$). Systolic and diastolic blood pressure in the intervention group decreased significantly ($p<0.05$) (systolic $p=0.001$ and diastolic $p=0.018$) in the post study. From this study, it is concluded that the "brief counseling-5A by pharmacist" and "motivational SMS" had a positive impact on patient's QoL and patient's blood pressure, hence, the therapy outcome has been achieved.

Keywords: Adherence, blood pressure, brief counseling, hypertension, quality of life, SMS

Peningkatan Kualitas Hidup (QoL) Melalui Kepatuhan Terapi Antihipertensi dengan *Mobile Phone Text Messaging* (SMS) dan *Brief Counseling*-5A pada Pasien Rawat Jalan Poliklinik Penyakit Dalam Rumah Sakit PKU Muhammadiyah Bantul, Yogyakarta

Abstrak
Hubungan kesehatan dan kualitas hidup (*Health Related Quality of Life*) merupakan salah satu karakter psiko-sosial penting yang dapat memengaruhi kemampuan pasien dalam penatalaksanaan terapi. Kurangnya pengetahuan mengenai hipertensi dan perubahan gaya hidup dapat memengaruhi kualitas hidup pasien. Salah satu intervensi farmasis dalam penatalaksanaan hipertensi adalah konseling. Konseling motivasional membantu pelayanan kesehatan untuk menggali pemahaman pasien serta kesiapan pasien untuk berubah. Tujuan penelitian ini adalah untuk mengetahui pengaruh pemberian *brief counseling*-5A disertai SMS motivasional oleh farmasis terhadap kualitas hidup dan pengontrolan tekanan darah pasien hipertensi di poliklinik penyakit dalam RS PKU Muhammadiyah Bantul, Yogyakarta. Penelitian dilakukan secara quasi-eksperimental dengan pengambilan data secara prospektif selama periode Januari hingga April 2013. Sejumlah 60 subjek yang memenuhi kriteria inklusi dibagi menjadi dua kelompok yaitu 30 pasien (50%) mendapatkan "*brief counseling* 5A" serta SMS motivasional (kelompok perlakuan) dan 30 pasien (50%) mendapatkan pelayanan kefarmasian konvensional (*usual care*) sebagai kontrol. Pengumpulan data dilakukan dengan melakukan wawancara dan pengisian kuisioner kepatuhan *Morisky Medication Adherence Scale* (MMAS), dan kuisioner kualitas hidup SF-36. Nilai tekanan darah diambil dari catatan medis. Kualitas hidup pasien hipertensi menunjukkan peningkatan rerata pada kunjungan kedua (*post*) di semua domain baik nyeri, fatigue, Fungsi Fisik, Fungsi Emosi, Fungsi Sosial, Keadaan Fisik, Keadaan Emosi (Status Mental), dan Keadaan Umum (Kesehatan umum). Perubahan yang bermakna ($p<0,05$) terjadi pada domain fungsi fisik (PF), fungsi emosi (FE) dan nyeri. Terjadi penurunan tekanan darah sistolik ($p=0,001$) dan diastolik ($p=0,018$) pada kelompok perlakuan sementara pada kelompok kontrol tidak terjadi penurunan tekanan darah sistolik ($p=0,730$) dan diastolik ($p=0,786$). Berdasarkan hasil penelitian ini, dapat disimpulkan bahwa pemberian "*brief counseling* 5A" serta SMS motivasional oleh farmasis pada pasien hipertensi memberikan pengaruh positif terhadap kualitas hidup pasien dan tekanan darah sehingga tujuan terapi antihipertensi tercapai.

Kata kunci: *Brief counseling*, hipertensi, kepatuhan, kualitas hidup, SMS, tekanan darah

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Background

Hypertension contributes to the risk of other diseases, such as coronary heart and stroke that can resulted from damages of heart, brain, and kidneys. It also may lead to death.[1] In 2008, there were 40% of adults aged 25 and above diagnosed with hypertension. It rose from 600 million in 1980 to 1 billion people in 2008.[2] According to RISKESDAS in 2007, hypertension is the third rank of the death cause at all ages after stroke and tuberculosis as much as 6.8%.[1] The increasing prevalence of hypertension is attributed population growth, aging and behavioural risk factors, such as unhealthy diet, harmful use of alcohol, lack of physical activity, excess weight and exposure to persistent stress.[3] Healthy people in 2010 for hypertension advised the need for more comprehensive and intensive approach to achieve optimum blood pressure control. Pharmacist intervention can improve blood pressure control in a hypertension patient, in the form of counseling, either directly or indirectly.[4] Counseling aimed to improve therapy outcome to maximize the use of drugs proper.[5,18,19] Motivational counseling (the brief counseling) had been developed by William R. Miller, Ph.D, a method and clinical skills counselor who developed psychotherapy to help patients committed to change.[24]

According to WHO, a health is not only without disease and weakness but also health in physical health, mental and social welfare. Hence, health related quality of life (HRQoL) refers to the effects of disease and therapeutic in physical patients, psychological and social welfare as felt by the patient[17]. The quality of life (QoL) is a state of well-being that consists of two combination of components; the ability to take daily activity (that reflects physical, psychological, and social welfare) and satisfaction patients during the level of function and control of disease.[6] The measurement of QoL played such a big role in assessed the healing patients and can be used as valid indicator to see if therapy is profitable or is not seeing the success of its therapy.[7]

The poor compliance of antihypertensive therapy became one of the obstacles in achieving blood pressure control and quality of life. Socio-demographic, treatment therapy, clinical condition, habits and psycho-social behavior are several factors that affect the treatment adherence.[8] Although the patients received pharmacological antihypertensive therapy effectively, but they are not getting maximum benefit, it is shown by low goals of therapy and quality of life and increase in cost therapy.[9]

Measurement of relation between HRQoL and adherence therapy is still debatable.[8] Various methods and techniques of intervention have been developed to improve the treatment compliance and quality of life, but the method of counseling and motivational SMS is still questionable and have not been clear and rational.[20,21,22,23] Previous study has been done to see the impact of counseling in the behavior changes on the hypertensive patients.[2] Therefore, it needs an improvement to understand the impact of counseling in the quality of life and controlling blood pressure. Based on that reason, we need to investigate and identify the influence of pharmacist counseling with method "brief counseling-5A" and "motivational SMS" in quality of life and blood pressure hypertension patients.

Methods

This study uses a quasi-experimental design to provide the interventions in the form of "brief counseling-5A and motivational SMS". The protocol of this study has been reviewed by an expert in the academic seminar, and has been approved and permitted by Hospital of PKU Muhammadiyah Bantul Yogyakarta, by number is 1627/KET/B/12.[12].

Inclusion criteria in this study were patients

at age between 18–65 years old, both men and women under the diagnosis of hypertension stage 1 and 2 with or without dyslipidemia and diabetes mellitus (DM), get one or more of hypertension drugs, had a cell phone, not deaf and literate. Exclusion criteria were patients who had deafness, illiterate, and was pregnant. Subjects who participated in the study had been given informed consent from the researcher and had agreed to participate.

Subject who were eligible in inclusion criteria and who accepted informed consent, were divided into two groups. The intervention group received "brief counseling-5A" and "motivational SMS" and control group only received usual care. The intervention group received "brief counseling" with 5A method, consist of Assess, Advise, Agree, Assists, and Arrange. Each stage represented a step in the intervention of counseling. In addition, intervention group also received short message service (SMS) as a reminder and motivation every day at 7 A.M. for approximately 15–20 day or until the second visit. Patients were followed for approximately one month from pre-study to post-study. The content of the short message (SMS) motivational is based on reference from previous study of SMS reminder in HIV patients in Africa.[10] The content of the motivational short message (SMS) is as follows: "Assalamualikum, good morning Mr./Mrs., you are important for your family, have you prepared your drugs this morning? Thank you very much. -Putri UAD"

The brief counseling-5A and motivational SMS conducted by a pharmacist who has been standardized by counselors who were competent in assessment brief counseling 5A. In the Assess stage, the counselors assess the risk factors, the level of knowledge, beliefs and behaviors of patients related to the disease and treatment, and assess the patient's level of readiness to change. In the Advise stage, the counselors give explanation or suggestions about behavior change clearly and information about the advantages of changing behavior and disadvantages of unhealthy behavior. In the Agreement stage, the counselors and patients together collaborate for making decision strategy in order to improve adherence to achieve expected target behavioral changes based on patient's willingness. In the Assist stage, the counselors identify the barriers toward patients, or help to solve various problems patients has been facing by giving a summary of a planned treatment, training the skill of using tools to assist in the self-management, giving compliance in the form of SMS motivational and social support as a reminder in order to change the behavior. The last stage is Arrange that follow-up the progress and possible obstacles by the counselor to the patient, it is shown by the patient's response when getting daily motivational SMS and phone calls which was done to monitor the progress of patients.[11,12,16,24]

The data conducted by interviewing and filling in compliance questionnaire "Morisky Medication Adherence Scale (MMAS) and the quality of life (QoL) questionnaire of SF-36, whereas the blood pressure was taken from medical records. Statistical analysis used are Chi-Square and t-test for the value blood pressure and quality of life (QoL), the results of the displayed analysis showed in mean ± standard deviations (SD).

Results

The study conducted in January–April 2013 in the PKU Muhammadiyah Bantul Hospital, Yogyakarta. Eligible election patients were mixed randomly into intervention and control group. The subjects were divided into two groups based on the condition of odd order put into the control group while the even put into intervention group.

A total number of 330 patients who got hypertension treatment at PKU

Muhammadiyah Bantul Hospital in period of January–April 2013 were recruited. 264 patients excluded and 61 patients selected by the inclusion criteria. One patient dropout due to absence of patient until the end of the study, hence we obtained 60 patients. Patients who had followed the study from the pre-study until post-study were 60 patients. Each consists of 30 patients who got "brief counseling-5A" and "motivational SMS" (intervention group) and 30 patients who got usual care alone (control group). Monitoring adherence, quality of life (QoL) and blood pressure performed in the second visit. Characteristic of socio-demographic patients in both control and intervention group shown in Table 1, which the result is based on previous research by Ginanjar, *et al.*, (2016).[2,24] Characteristic of patients between control and intervention groups did not differ significantly ($p<0.05$) (see Table 1).

Based on the data characteristic of patients, it was found that the majority of the subjects both the control and the intervention

Table 1 Characteristics of Subjects in PKU Muhammadiyah Bantul Hospital, Yogyakarta

Characteristics of Subjects	Intervention Group		Control Group		p
	(n=30)	%	(n=30)	%	
Gender[2]					
Male	8	26.7	9	30.0	0.604
Female	22	73.3	21	70.0	
Ages[2]					
18–29					0.619
30–39	1	3.3			
40–49	9	30.0	5	16.7	
50–59	13	43.3	16	53.3	
60–65	7	23.3	9	30.0	
Education[2]					
0–9 years	14	46.7	20	66.7	0.423
10–12 years	8	26.7	6	20.0	
>12 years	8	26.7	4	13.3	
Job[2]					
Government employee	7	23.3	7	23.3	0.536
Private	21	70.0	16	53.3	
Laborer	2	6.7	5	16.7	
Does not work			2	6.7	
Health Costs					
Independent cost	10	33.3	12	40.0	0.833
Health insurance of ASKES	13	43.3	9	30.0	
JAMKESMAS	4	13.3	8	26.7	
Other insurance	3	10.0	1	3.3	
History of Hypertension[24]					
Exist	20	66.7	9	30.0	
Nothing	10	33.3	21	70.0	0.097
Stage of Hypertension[2]					
Stage 1	17	56.7	19	63.3	0.864
Stage 2	13	43.3	11	36.7	

Pearson correlation for parametric data, Spearman correlation for non-parametric data

[2]Ginanjar, *et al.* (2016)

[24]Ginanjar, *et al.* (2016)

Table 2 Initial Data Assessment (Baseline) Level of Compliance, Blood Pressure and Function of the Quality of Life of Patients Domain Hypertension Control and Treatment Groups

Variable	Control Group n=30		Intervention Group n=30		p
	∑	%	∑	%	
Level of Adherence					
High	5	16.7	12	40.0	0.072
Moderate	13	43.3	10	33.3	
Low	12	40.0	8	26.7	
	Mean	**SD**	**Mean**	**SD**	
Systolic blood pressure	148.53	20.83	153.53	19.67	0.343
Diastolic blood pressure	83.77	10.26	89.73	10.34	0.006*
Quality of Life Domains					
Physical function	71.16	24.48	81.39	19.69	0.093
Emotional function	85.27	12.93	93.77	8.89	0.003*
Social function	74.37	25.27	98.73	5.07	0.000*
Role physical	61.67	36.98	84.33	23.15	0.010*
Mental health	58.88	37.84	78.89	28.34	0.010*
Pain	62.17	21.20	73.00	28.51	0.100
Fatigue	65.5	13.73	82.94	9.78	0.000*
General health	73.99	11.57	80.00	9.69	0.033*

* = significantly different ($p<0.05$) between control group and intervention group
p = Different test of SF-36 domains and SBP/DBP between control and intervention group with independent sample t-test (normal distribution, $p>0.05$) and Mann-Whitney test (not normal distribution, $p<0.05$)

group were women, the mean age ranged from 50–59 years. The education level of the patients was mainly in the period of 0–9 years. Almost patients were worked at private sector. The majority of the cost of health care patients were independent payment in control group and insurance payment in the treatment group. The family history of hypertension in intervention group is greater than control group. Almost patients in control and intervention group were diagnosed hypertension grade I. Each patient characteristic showed p-value>0.05, which showed that both control and intervention groups were not significantly difference.

Initial data assessment (baseline) was performed in this study on measured variables; compliance rate, systolic and diastolic blood pressure and the function of the quality of life domains. It was aimed to see whether control group and intervention group had any similarities or differences before getting "brief counseling-5A" and "motivational SMS". Changes at the end of study resulted from pharmacist intervention. The baseline assessment of compliance levels,

Table 3 Effect of Brief Counseling 5A and Motivational SMS for Adherence Level of Hypertensive Patients during Second Visit

Group	Level of Adherence			N	p
	High	Moderate	Low		
	%	%	%		
Control	20.0	53.3	26.7	30	0.000*
Intervention	83.3	10.0	6.7	30	

* = significantly different ($p<0.05$) between control group and intervention group

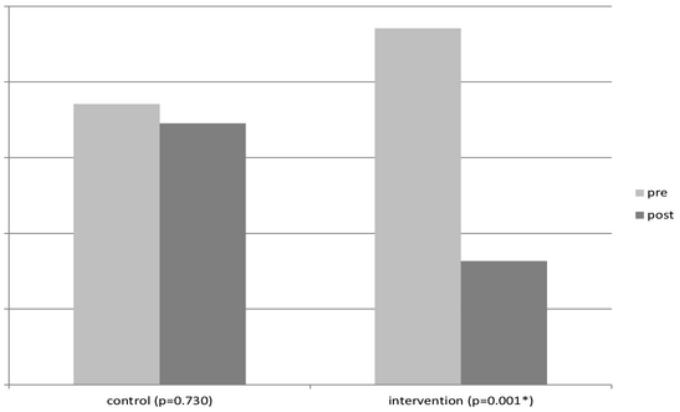

Figure 1 Mean Systolic Blood Pressure (TDS) at First Visit (Pre) and Second Visit (Post) in Control and Intervention Groups

blood pressure and function of the quality of life domain of patients hypertension control and intervention groups are presented in Table 2.[2]

MMAS questionnaires have a total score of 8, with a high compliance rate (MMAS value=8), moderate adherence (MMAS value 6–<8) and low adherence (MMAS value=<6). Results of assessments of compliance with hypertension intervention and control groups on the second visit (post) can be seen in Table 3.

Results of mean systolic blood pressure (SBP) first visit (pre) and the second visit (post) in the control and the intervention group can be seen in the figure below (Figure 1), and result of mean diastolic blood pressure (DBP) pre and post intervention can be seen in Figure 2.

Measurement of quality of life using instruments of questionnaire SF-36 consists of 8 domains. The domains consist of physical function, emotional function, social function, role physical, mental health, pain,

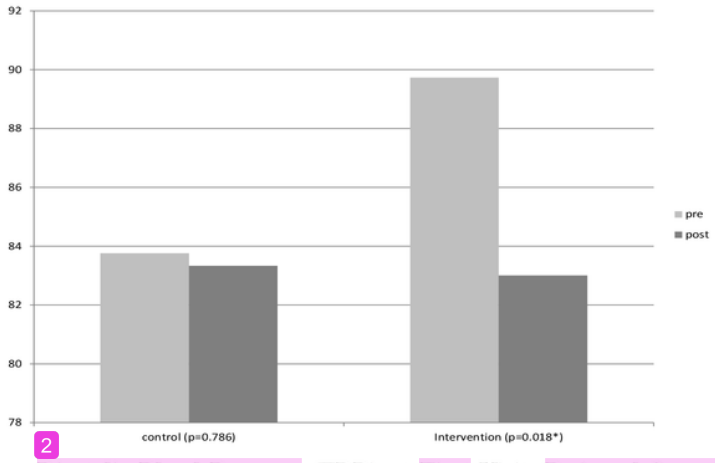

Figure 2 Mean Diastolic Blood Pressure (TDD) at First Visit (Pre) and Second Visit (Post) in Control and Intervention Groups

Table 4 Differences in Mean SF-36 Domains Between Control group and Treatment Group at Second Visit (Post)

Domain of SF-36	Control Group (n=30)	Intervention Group (n=30)	p
Physical function	72.67±23.84	87.17±12.15	0.008*
Emotional function	86.3±13.46	97.2±4.47	0.000*
Social function	81.47±20.94	96.67±14.28	0.000*
Role physical	59.17±38.55	85.0±24.21	0.005*
Mental health	55.54±38.49	83.33±25.89	0.001*
Pain	67.5±21.67	86.83±13.86	0.000*
Fatigue	69.08±13.20	84.13±10.55	0.000*
General health	75.27±12.61	80.92±9.36	0.027*

* = significantly different ($p<0.05$ between control group and intervention group)

p = different test of SF-36 domains and SBP/DBP between control and intervention group with independent sample t-test (normal distribution, $p>0.05$) and Mann-Whitney test (not normal distribution, $p<0.05$).

fatigue, and general health. Differences in mean SF-36 domains between the control and the intervention group at the first visit (pre) and second visit (post) can be seen in Table 3.

Discussion

This study has been carried out the initial assessment (baseline) to determine the level of compliance, the value of blood pressure (systolic and diastolic) and the quality of life of patients with hypertension.

Based on the results of the initial assessment, the compliance levels between intervention and control groups did not differ significantly ($p>0.05$). The value of systolic blood pressure (SBP) between the control and intervention group is not significantly different ($p>0.05$), but the value of diastolic blood pressure (DBP) shows a significant difference ($p<0.05$). Data of blood pressure in this study is not a blood pressure early on first diagnosed patients of hypertension, but it is a patient's blood pressure in this period in therapy hypertension.

The value of function of quality of life domains physical function (PF) and pain did not differ between control and intervention groups ($p>0.05$), but a function of emotion (FE), social function (SF), mental health (MH), role emotional (RE), fatigue, and general health (GH) shows significant differences toward baseline that is on the first visit ($p<0.05$).

Assessment of quality of functions with SF-36 questionnaire is based on the subjective of the patient's assessment or on what is perceived by patient. Therefore, some domain shows a difference in the initial assessment. This can be tolerated because in the sampling process, researcher did not perform equalization process or matching samples.

Patients compliance can affect the successful of the therapy. Therefore, uncompliance level should be measured to determine the effectiveness of the increase in the level of blood pressure control. The approach taken to measure compliance with treatment was done using MMAS.[13,14]

The results of patient compliance both intervention and control groups on the second visit (post) were shown in Table 3. The results show significant increase in the level of compliance in each group. The correlation of compliance level between the intervention and control group showed $p=0.000$ (p-value<0.05) in the second visit (post study). From this study we concluded that the "brief counseling-5A and motivational SMS" as a reminder and motivation in intervention

group gave a positive impact on the level of compliance of hypertensive patients. Increased compliance with antihypertensives is expected to increase in systolic blood pressure control (SBP) and diastolic (DBP).

The results showed that the mean of systolic blood pressure (SBP) in the pre study (first visit) in the control and intervention groups decreased during the second visit. It is shown from 147.27±20.79 (mmHg) in the control group, and 138.17±17.64 (mmHg) in the intervention group. Mean diastolic blood pressure (DBP) also decreased during the second visit (post), this can be seen in Figure 2. DBP control group decreased to 83.33±9.32 (mmHg) p=0.786 (p>0.05), while the intervention group decreased to 83.00±10.22 (mmHg) p=0018 (p<0.05).[24]

The mean of SBP and DBP at first visit (pre study) and the second visit (post study) in the control group has shown in the p-value 0.730 and 0.786 (p>0.05). From this study, we concluded that patients with hypertension in the control group who getting usual care alone from hospital pharmacists did not occur significant differences in the mean SBP and DBP. Contrary in the intervention group, the mean of SBP and DBP at first visit (pre study) and the second visit (post study) has shown in the p-value 0.001 and 0.018 (p<0.05). It can be concluded that patients with hypertension in intervention group who were given "brief counseling-5A" and "motivational SMS" had significant differences in the mean of SBP and DBP.

The presence of significant changes in the mean of SBP and DBP at first visit (pre) and second (post) in the intervention group showed the effect of "brief counseling-5A" and "motivational SMS" to control blood pressure. This is consistent with previous research that said pharmacists intervention can improve the treatment of blood pressure in hypertensive patients.[4]

Beside of blood pressure control, the purpose of this study were to assess the quality of life in order to see the outcome of therapy. Measurement of quality of life was done using instruments such questionnaire SF-36 that consists of 8 domains. The domains consist of physical function, emotional function, social function, role physical, mental health, pain, fatigue, and general health. Differences in mean of SF-36 domains between the control and the intervention group at first visit (pre study) and second visit (post study) can be seen in Table 3.

The mean differences results in SF-36 domain control and intervention groups at second visit (post study) including pain, fatigue, physical function, emotional function, social function, role physical, mental health and general health sequentially indicates the p-value=0.000; 0.000; 0.008; 0.000; 0.000; 0.005; 0.001; 0.027 (p<0.05). Clinically it showed that the domain of pain, fatigue, physical function, emotional function, social function, role physical, mental health, and general health between the control group and the intervention group at the second visit (post study) differ significantly. This suggests awarding "brief counseling-5A" and "motivational SMS" have a positive influence on all domains.

The intervention group showed an improvement in mean in all domains at first visit (pre study) and second visit (post study). A significant increase showed in the domain physical function, emotional function, and pain with statistically significant differences (p<0.05). Improved scores of the three domains showed improvement in all three domains. Physical function domains showed a mean improvement from 81[3] to 87.[7] This shows an improvement in activities related to physical functions such as activities that drain energy, the ability to walk from one block (alley) up to 1.6 km, climbing stairs and lifting weights.

Emotional function domains showed

a mean improvement from 93.7 to 97.2, indicating an improvement in emotional function associated with mental health such as anxiety, despair, calm, peaceful, sad, moody, and bored. Domain of pain showed a mean improvement from 73.0 to 86.8. This showed that the perceived improvement of the patient's pain as the clinical manifestations or symptoms of hypertension experienced improvement, or decreased pain during the second visit (post study). This study is consistent with the research of Medsen, *et al.*, (2008) which stated that the group treated with telemonitoring of blood pressure showed a mean increase in pain domain score, which means a decreased pain compared to the control group[15].

The results are consistent with research on HRQoL (health related quality of life) with telemonitoring of blood pressure in a program of home blood pressure monitoring (HBPM) done with the instrument SF-36, the results showed improvements pain domain in the intervention group which were shown from higher mean score pain domain intervention group was compared to control group (p=0.026).[15]

Other studies about HRQoL in hypertensive patients indicated their correlation between improved quality of life and the high compliance of the patient and then control the blood pressure both systolic and diastolic by cohort study.[6] This is consistent with the findings that the administration 'brief counseling-5A "and motivational SMS" had a positive influence on the quality of life and blood pressure control.

Conclusions

"Brief counseling-5A" and "motivational SMS" by pharmacists had given a positive effect on compliance with antihypertensive therapy and QoL of hypertensive patients so the hypertension treatment goals can be achieved. It is recommended that pharmacist should improve the counseling method by "brief counseling-5A" and "motivational SMS" in public health system to improve patient's knowledge, increase adherence, and achieve blood control pressure and QoL.

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Conflict of Interest

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