

## RESEARCH COMMUNICATIONS

# The influence of a medication counseling program for hypertensive soldiers at the Army General Hospital: A pilot study

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### ABSTRACT

**Background:** The incidence of hypertension and its complications continue to increase in the Philippine Army due to non-adherence resulting in poor health outcomes.

**Objective:** This study implemented a Medication Counseling Program (MCP) for hypertensive soldiers, and assessed the effects of the program on knowledge of disease and treatment (Knowledge), attitude towards medication (Attitude), adherence to treatment (Adherence), and blood pressure (BP). It identified and categorized pharmacist interventions applied during the counseling sessions. The perceptions of patients and physicians on pharmacist's clinical roles were also determined.

**Methodology:** The program was implemented from March to October 2015 in a government hospital for the Philippine Army. Knowledge, attitude, adherence, and BP (converted as mean arterial pressure or MAP) were measured at baseline, 30, 60, and 90th day after initial counseling. Data for pharmacist interventions were collected from patient's documentary form. The interview was conducted to patients after their 90-day counseling period and physicians after the 8-month duration of the program.

**Results:** A total of 20 patients were enrolled in the program, but only 13 patients completed the study. Of the 62 counseling sessions conducted by the pharmacist for the 8-month period, a total of 252 pharmacist interventions were administered. Knowledge, attitude, adherence, and MAP scores improved, and 100 % of the patients achieved normal/controlled BP after the 90-day counseling period.

**Conclusion:** A pharmacist MCP intervention may improve a patient's knowledge, attitude, adherence, and BP. The program enabled the pharmacist to apply pharmacist interventions to identified drug-therapy problems of the patients and resolved these through collaboration with the physicians and cooperation of the patients.

**Keywords:** *adherence, medication counseling, pharmacist interventions, team-based care, military pharmacist, hypertension counseling*

## Introduction

Hypertension is considered as the most significant risk factor for deaths worldwide. Every year, it causes seven million deaths while 1.5 billion people suffer due to its complications [1]. In the Philippines, diseases of the heart, including hypertension, have been consistently among the top ten causes of morbidity. In the Army General Hospital (AGH), a military hospital for the active soldiers of the Philippine Army and their dependents in Taguig City, hypertension increased from 11.6% of the total patient population in the outpatient in 2010 to 13% in 2012 [2]. Findings from a previous unpublished study revealed that

there was poor understanding of the patient's disease, medication, and treatment resulting in non-adherence. Non-adherence resulted in poor health outcomes such as development of coronary heart disease, cardiovascular disease, end-stage renal disease and increased admissions in the hospital. This not only affects a soldier's effectiveness to carry out their civic and military duties but has economic impact as well due to increase in the Philippine Army's (PA) health spending.

Several studies have acknowledged that medication counseling by pharmacists can improve patient's adherence

to hypertensive medications [3,4]. In developed countries, a medication counseling program (MCP) for the armed forces is usually in place. There exists a Pharmacy Corps where military pharmacists ensure that medicines are provided to soldiers with chronic diseases wherever they are deployed, and patient medication counseling is offered [5]. Despite existing literature, MCPs for hypertensive patients or other initiatives on improving health literacy among the uniformed men and women are still lacking in the Philippines.

The effects of an MCP implemented in AGH on the knowledge of disease and treatment, attitude to medication, treatment adherence, and blood pressure (BP) at baseline, 30,60, and 90 days after receiving counseling among hypertensive soldiers is reported in this paper. The pharmacist interventions during the counseling sessions were identified and categorized. The perceptions of the attending physicians and patients on pharmacist clinical roles were also explored.

## Methodology

### *Research design*

For the assessment of the program, a pre-test and repeated post-test research design was employed. The intervention was the medication counseling program which was implemented from March to October 2015. This research was approved by the UP Manila Research Ethics Board (UPMREB 2014-148-01), and all the research ethics were strictly followed.

### *Population of the study*

The soldiers in active duty with a medical diagnosis of stage 1 or stage 2 hypertension based on the 7th Joint National Committee on Hypertension (JNC 7) [6] and on antihypertensive medications were included. Exclusion criteria were hypertensive patients with the presence of comorbidities such as heart disease, diabetes, and chronic kidney disease. Patients, who after consultation failed to comply with the study protocol, were withdrawn from the study.

The sample size of 20 participants was purposively selected through a review of records and doctor's referrals. This was the estimated average number of diagnosed hypertensive soldiers per month.

### *Instrumentation*

Documentation form, questionnaire, interview guide, and sphygmomanometer were used to collect data. The documentation form asked about demographic characteristics, medication history, lifestyle factors of the patient, and pharmacist interventions applied during the counseling sessions. The questionnaire asked about the knowledge, attitude, and adherence of the patient. Knowledge was measured using a 25-item knowledge questionnaire adapted from the study of Oliveria *et al.* [7] and important counseling points from JNC 7. This was expressed in terms of knowledge score. Attitude was measured using a 5-point Likert scale questionnaire patterned after the Theory of Planned Behavior by Francis *et al.* [8]. These statements refer to the patient's beliefs on medications and were expressed as an attitude score. Adherence questionnaire, which was adapted from Morisky *et al.* [9], refers to the understanding of how the medicine should be used. Adherence was classified as high, medium, or low. The sphygmomanometer used was calibrated and validated to monitor BP. Interview guide asked about patient's and doctor's perceptions and opinions on the MCP and pharmacist's role.

### *Data collection procedure*

The flow of the study is shown in Figure 1. Recruitment took place at the hypertension clinic of the AGH. The counseling was administered in a separate room inside the pharmacy. A scripted counseling form incorporating core counseling items from JNC 7 assessing the patient's management of the treatment, side effects, and quality of life was used by the pharmacist [6]. Brochure and patient education leaflets were also provided to the patients. An individualized care plan mutually agreed upon by the pharmacist and the patient was developed. During subsequent counseling visits at 30, 60, and 90 days the pharmacist determines problems in therapy when the BP goal is not achieved so appropriate intervention is provided. All therapeutic alternatives and non-drug treatment were considered. Pharmacist's interventions regarding therapy were referred to the attending physician for approval.

### *Data analysis*

Quantitative data collected was encoded in Excel and processed using Stata version 14 software. Frequency counts, percentages, and descriptive statistics were used to summarize the demographic characteristics, knowledge,

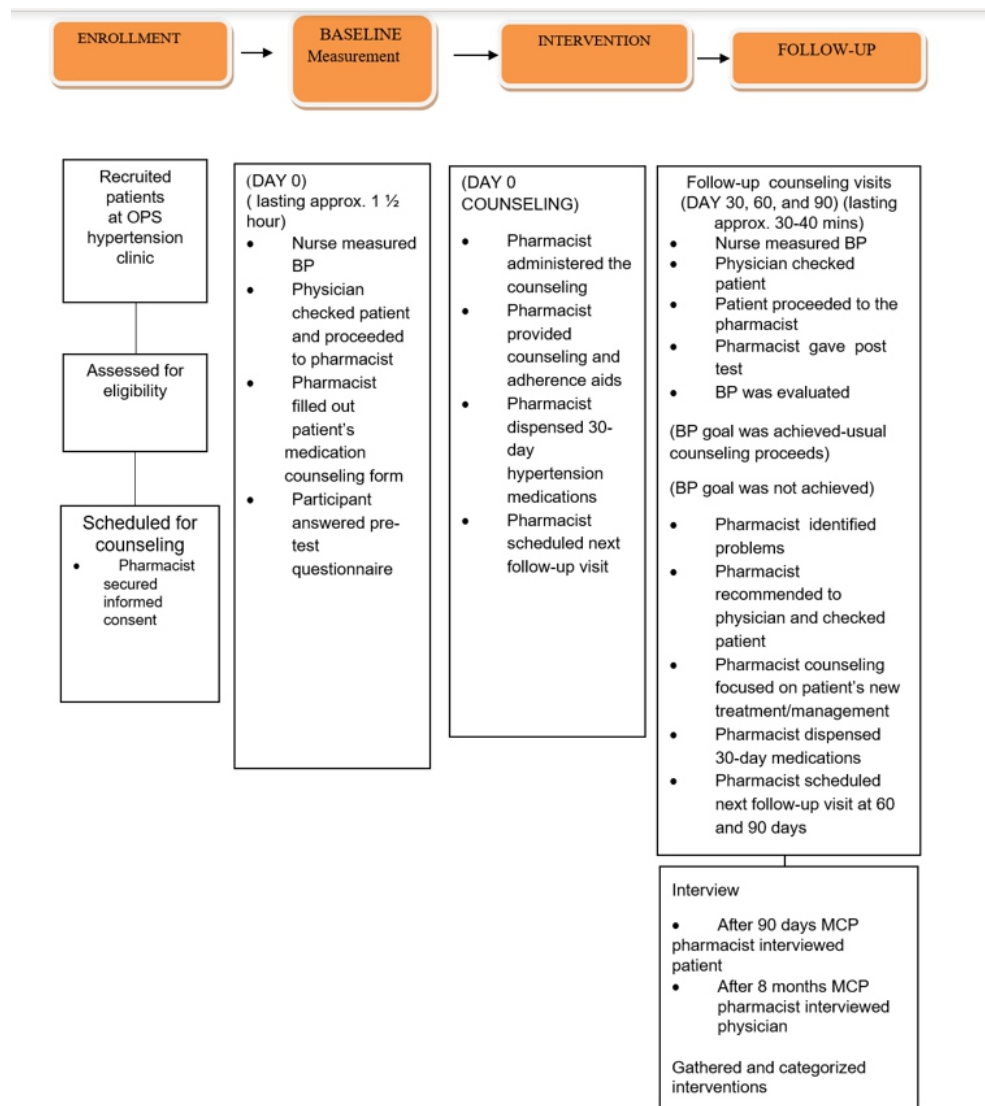


Figure 1. Flow diagram of patients through the study protocol (modified from CONSORT 2010 Statement).

attitude, and MAP. BP was converted to MAP to approximate the weighted average of BP values.

## Results

A total of twenty (20) patients who met the study criteria were enrolled in the study, but only thirteen (65%) completed the three follow-up counseling sessions. The seven patients were either engaged in other military activities or diagnosed with diabetes and heart disease. The demographic characteristics of these patients are presented in Table 1.

Forty-five percent (6 patients) had stage 1 hypertension (SBP of > 140–159, DBP of > 90–99), and the most common co-morbidity reported was hyperuricemia (62%). The most

predominant stress factor identified was work (46%). The patients verbally expressed during counseling that the causes of their work stress include prolonged hours of work, night duties, pressure from their superiors to accomplish several tasks, and subordinates that are difficult to deal with. Participants with stage 1 hypertension were treated with Amlodipine tablet while patients with stage 2 hypertension were given Losartan and Amlodipine tablets. Therapeutic regimens prescribed were appropriate according to the 8th Joint National Committee on Hypertension Guidelines (JNC 8) [10].

A total of 62 counseling sessions were conducted during the 8-month period. There were 252 counseling interventions administered. The interventions included patient education on lifestyle, medication and treatment

adherence, reminder system, feedback to doctor, and medication management presented in Table 2 [11]. All recommended interventions were approved by the physicians. Twelve drug therapy problem consults between pharmacist and attending physicians took place. At the end of the 90-day counseling period, results showed 32% increase in knowledge, 12.3% increase in attitude and a 10.6% decrease in MAP scores (Table 3). The proportion of patients with high adherence increased by more than a 100%. All patients achieved normal/controlled BP. The pharmacist intervention on diet and lifestyle modification also led to weight changes, uric acid levels and habits of the participants (Table 3).

**Table 1.** Demographic characteristics of the patients.

Variables	Number	Percentage	Mean	SD
<b>Sex</b>				
Male	13	100	-	-
<b>Stress factors (rating)</b>				
Family	4	31	1.8	0.9
Work	6	46	2.2	0.8
Health	3	23	2.1	0.8
<b>Weight</b>	13		80.1	9.8
<b>Age (age group)</b>				
34-40	6	46.2	43.6	7.6
41-45	2	15.4	-	-
46-50	1	7.7	-	-
51-55	4	30.8	-	-
<b>Civil status</b>				
Married	13	100	-	-
<b>Number of cigarettes per day</b>				
0	6	46.2	-	-
1-9	4	30.8	-	-
10 and above	3	23.1	-	-
<b>Number of bottles of alcohol per day</b>				
Occ	5	38.5	-	-
0	4	30.8	-	-
1	2	15.4	-	-
2	1	7.7	-	-
3	1	7.7	-	-
<b>Diet</b>				
Meat	10	77	-	-
Fish and vegetables	3	23	-	-

All patients expressed their gratitude for the counseling program and the monthly supply of their hypertensive medicines during the study. They recognize that the pharmacist is a valuable source of medical information, and they felt better being counseled about their treatment by a pharmacist. The two attending physicians interviewed shared that they were very receptive and comfortable to these new pharmacist's roles and agreed that the pharmacist must inform the physician when a drug-therapy problem occurs. They expressed that the pharmacist had been helpful in keeping track of the progress of their hypertensive patients.

## Discussion

The results of the study showed how an MCP conducted by pharmacists can improve knowledge, attitude, and adherence to treatment among hypertensive soldiers. Adherence to treatment leads to improvement of BP. Improved knowledge can also lead to lifestyle changes which likewise help in the proper management of hypertension. The results were consistent with existing literature. Better understanding of the disease, especially their BP levels and cardiovascular risk with uncontrolled BP, as a result of counseling alters a patient's misconceptions, culture, and beliefs towards their medications and treatment [7,12,13,14]. An increase in attitude scores agrees with other studies [12,14,15]. A change in attitude can lead to behavioral changes although this required time. Adherence to medications is a desirable behavior that is key factor to proper management of hypertension. In this study, it is observed that from 53.8% initially classified as medium and high adherence, this was increased to 92.3% after 3 months. The self-reports of patients regarding their lifestyle changes are also positive behavioral changes brought about by improved knowledge and attitude.

During the counseling sessions, drug-related problems were identified but were appropriately addressed through changes in therapy and other lifestyle modification. The timely identification of these problems and subsequent adjustments in the patient's care plan is a major advantage of having similar programs in place to ensure that better patient outcomes are achieved. However, these programs will only be effective if physicians and pharmacists understand each other's roles [17,18,19,20].

Despite the positive results and consistency with existing literature, it is recognized that the small sample size is a major setback of this study. It limited the use of more

**Table 2.** Details of the pharmacist-directed care intervention.

Category of interventions	Number of interventions at:				
	Baseline	30 days	60 days	90 days	Total
1. Patient education and counseling on lifestyle, medication, and treatment adherence	20	15	14	13	62
2. Reminder system					
a. Telephone contact	20	15	14	13	62
b. Drug adherence aids	20	15	14	13	62
3. Feedback to doctor					
a. Drug-related problem identification	-	1	2	2	5
b. Recommendation to doctor for increase/decrease of dose	-	1	1	2	4
c. Recommendation to doctor for medication change	-	1	2	2	5
d. Recommendation to doctor for additional medications	-	1	3	5	9
3. Recommendation to doctor for blood chemistry	1	4	5	2	12
4. Medication management					
a. Drug monitoring after adjustment of medication	5	1	7	2	15
b. BP measurement and reviewing of home BP measurement after adjustments of medications	6	1	7	2	16
c. Total pharmacist interventions	72	55	69	56	252

**Table 3.** Mean scores of the outcome variables.

Variables	Baseline	30 days	60 days	90 days
Knowledge (SD)	16.1 (3.80)	19.4 (4.03)	21.2 (3.44)	21.4 (3.50)
Attitude (SD)	13.8 (1.96)	15.0 (1.08)	15.3 (1.18)	15.5 (1.20)
Mean Arterial Pressure (SD)	105.1 (12.08)	95.8 (9.89)	97.3 (7.88)	93.8 (5.41)
Level of adherence				
Low	6 (46.2%)	2 (15.4%)	1 (7.7%)	1 (7.69%)
Medium	4 (30.8%)	5 (39%)	6 (46.2%)	5 (38.5%)
High	3 (23.1%)	6 (46.2%)	6 (46.2%)	7 (53.9%)
Proportion of patients with normal/controlled blood pressure	54%	85%	85%	100%
<b>Other observed changes</b>				
				n
Weight loss (average of 5 pounds)				6
Uric acid levels returned to normal (based on laboratory results)				4
Other self-reported changes				
Quit smoking or reduced the number of cigarette sticks per day				6
Shifted to a diet of fish and vegetables				7
Decreased their cups of coffee to one per day				2
Avoided energy drinks and Chinese herbal drugs				1
Reduced their intake of alcohol				2
Reduced their work stress by reading daily religious books and by obtaining medical certificates to exempt them from being assigned to strenuous activities, graveyard shift, and salty meals prepared in the mess hall				4
Bought own digital BP apparatus so they could monitor their daily BP				6

sophisticated statistical tests to conclude that the changes observed in knowledge, attitude, adherence, and blood pressure measurements were significant. Many lifestyle changes documented were also self-reports. The physician's perception of pharmacist clinical role was gathered by the pharmacist through the interview and may also be prone to biases. Considering the dearth of similar studies in the Philippines, it is expected that this study has provided some local evidence on the effects of a counseling program and may stimulate more extensive investigations on this topic.

The program has been recommended to be institutionalized at AGH, where the program was implemented. To reach more patients, more pharmacists should be trained to perform counseling. An integral part of the program will be the inclusion of research so that outcomes of the program can be monitored. Both the objective (BP monitoring) and subjective (self-administered questionnaires, instead of interviews, for both patients and physicians) measures of adherence will still be utilized. Other objective measures of adherence like pharmacy fills and pill counts can also be explored. With data from research, the evidence on the effectiveness of the program can be strengthened, and similar programs may be created for other chronic diseases or recommended for institution in other military clinics and hospitals. These programs aimed at improving literacy for the armed forces will be beneficial to patients, pharmacists, and the institution. For the patients, this can improve knowledge and attitude towards their disease and medications resulting to positive behavioral changes, and better disease management. For pharmacists, this is an opportunity to enhance and be recognized of their professional role as a drug information and health care provider, and to work collaboratively with physicians. For the institution, this program can be an inexpensive way of ensuring that its personnel preserve their strength so they can remain effective in carrying out their civic and military duties. This can also serve as a venue for training pharmacy students to prepare them for their professional roles.

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