

## Effectiveness of Self-Management Program on Knowledge, Medication Adherence and Blood Pressure Control among Hypertensive Patients: Randomized Controlled Trial

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**Abstract: Background:** Hypertension is a common and dangerous condition, and remains the worldwide leading risk factor for morbidity and mortality in developing countries. Therefore, patient support and self-management is needed to improve compliance and prevent complications. **The aim** of the study: is to assess the effectiveness of self-management program on knowledge, medication adherence and blood pressure control among hypertensive patients. **Subjects and methods:** The study was conducted in the outpatient clinics in hypertension outpatient clinic in Mansoura University Hospital (MUH) and Fayoum University Hospital (FUH), Egypt. Utilizing controlled quasi-experimental study design with pre and 4 weeks post implementation of program among 50 hypertensive patients. **Data collection tools:** Sociodemographic data, Physical assessment sheet, Hypertension knowledge assessment tool, and Compliance assessment tool. Each patient was evaluated at the baseline (pretest) and 4 weeks after implementing the programs. **Results:** Mean score of knowledge pre-program  $73.7 \pm 9.69$  while mean score knowledge after 4 weeks of intervention improved to  $(48.8 \pm 3.16)$  respectively. There were statistical improvement in blood pressure (BP) results of the patients over study phases ( $p < 0.05$ ), positive relation between patient knowledge and improve compliance and blood pressure control. In addition, there are significant statistically significance between age and knowledge and compliance with program implementation. **Conclusion and recommendations:** Self-management program had positive effect on improvement of patient's knowledge, compliance to therapeutic regimen and blood pressure (BP) control after implementing the educational program. It is recommended to conduct regularly plan interventions to support and improve long-term compliance and BP control in clinical setting. Continuous health education as routine care hypertensive patient in outpatient clinics.

[Salwa A. Mohamed and Ahmed A. Gomaa. **Effectiveness of Self-Management Program on Knowledge, Medication Adherence and Blood Pressure Control among Hypertensive Patients: Randomized Controlled Trial.** *Biomedicine and Nursing* 2018;4(4):57-68]. ISSN 2379-8211 (print); ISSN 2379-8203 (online). <http://www.nbmedicine.org>. 9. doi:[10.7537/marsbnj040418.09](https://doi.org/10.7537/marsbnj040418.09).

**Key Words:** Hypertension, self-management program, medication adherence, blood pressure control, patients' knowledge

### 1. Introduction:

Hypertension (HTN) is one of the major public health challenges worldwide and it is one of the key risk factor for cardiovascular and renal diseases<sup>1</sup>. Hypertension is the leading preventable risk factor for premature mortality and disability worldwide<sup>2</sup>. It is responsible for nearly 9.4 million lives are lost every year due to poor control of hypertension. In 2025 an estimated 1.56 billion adults suffering from hypertension<sup>3</sup>. Hypertension is known as the “silent killer” and usually don't overt manifestations that can be easily detected and more than 50% of hypertensive patients do not know they have HTN until organ damage has been established to heart, brain and kidney<sup>3,4</sup>.

The impact of hypertension and cardiovascular disease is influenced by behavioral risk factors such as use of tobacco, alcohol consumption, obesity, unhealthy diet, increase blood glucose level and elevated cholesterol level. Reduction of risk factors is a primary prevention in general population to reduce

CVD premature mortality<sup>5</sup>. It is important to emphasize the population healthy lifestyle modification because it is necessary and more effective both for preventing and controlling of hypertension and cardiovascular-related diseases.<sup>6</sup>

World Health Organization (WHO) defined hypertension as “systolic blood pressure equal or greater than 140 mm Hg and diastolic blood pressure equal or more than 90 mm Hg”.<sup>7,8</sup> Inadequate or incorrect management of hypertension despite the availability of effective anti-hypertensive drugs results in a complete range of complications leading damage to the heart, brain, retina, kidneys, deterioration in quality of life; and finally death.<sup>9,10,11</sup> Therefore, lifestyle management is an important component of hypertension treatment such as weight reduction, physical activity, stop smoking, healthy and lower-sodium diets, and frequency of BP monitoring combined with antihypertensive treatment for improving patient medication and recommended lifestyle adherence<sup>12,13</sup>. In addition, WHO stressed that

increasing the effectiveness of interventions about hypertension and preventive strategies should be considered as the key elements to health outcomes of population than improving specific medical treatments.<sup>14</sup>

Self-management support is the care and encouragement assuming to people with chronic conditions and their families to assist them understand their focal role in managing their illness, make informed decisions about care, and engage in healthy behaviors.<sup>15</sup> Chronic disease self-management programs or supports systematically provide education and support interventions by health care staff to increase patients' skill. Go and Colleagues found that self-management intervention lowered systolic blood pressure (SBP) by 10 mm Hg more than usual care<sup>16</sup>. Also, Chodosh et al. in which patients gain sufficient knowledge about hypertension disease has been associated with better blood pressure control as well as improve outcome<sup>17</sup>.

Medication adherence or taking medications correctly to maintain the optimum control of blood pressure to achieve optimum results from using antihypertensive medications is manifested by the absence of symptoms such as dizziness, headache and sweetness, normal blood pressure reading (120/80 mm Hg).<sup>18</sup> Medication non adherence to prescribed regimens can result in the adverse health outcomes and leads to increased morbidity and death.<sup>19</sup> In addition, Culig et al. found that patients with chronic diseases often receiving multiple medications, are at higher risk for non-adherence to medication. So, patient education and support improved adherence are necessary for improving health outcomes<sup>20</sup>. Moreover, continued education at different phases of time is helpful to enhance the retention of knowledge and its relationship to adherence<sup>21</sup>. According to previous study by Lee et al found that lack of adherence is the most important cause of failure to achieve BP control and leads to increase the risk of cardiovascular, stroke, and hospitalization. So, increasing the effectiveness of adherence practice improve health outcome of the population<sup>22</sup>.

Patient's knowledge and continued education at different phases of time is helpful to enhance the retention of knowledge, awareness regarding drug compliance in hypertension are presented about, healthy food, good nutrition, benefits of exercise, and harmful of obesity and stress its complications as well as their practice are some of the key factors in achieving compliance to medication and control of blood pressure.<sup>23,24</sup> Most of the previous studies revealed that effectiveness of behavioral interventions on improving adherence to medications and, support healthy lifestyles, and definite changes toward symptoms and treatment in patients with chronic

conditions.<sup>25,26</sup> Mekonnen et al. evidence the adherence to treatment is better in patients with HTN compared to other chronic diseases, good compliance with antihypertensive therapy is influenced by environmental factors, as well as presence of comorbidities, and the doctor-patient relationship<sup>27</sup>. Thus, there are positive relationship between hypertension knowledge and behavioral change with medication adherence and overall lifestyle modification. Hence, this paper discusses about medication adherence among hypertension patients in outpatient clinics. The aim of this study was to assess the effectiveness of self-management program on knowledge, medication adherence and blood pressure control among hypertensive patients.

#### **Operational definition:**

##### **Hypertension knowledge:**

Understanding and awareness of a participant about hypertension.

##### **Self-management program:**

A set of plan for providing of education and awareness to increase patients' skills about hypertension by promote the information on decrease salt in diet and healthy diet, physical activities, smoking cessation, measuring blood pressure technique.

##### **Significance of the Study:**

Hypertension (HTN) is one of major public health burden and is a high prevalence in Egypt, Many of the affected people are undiagnosed, and many of the diagnosed are not controlled or high non-compliance rate to hypertensive regimen. Proper management of HTN can substantially reduce stroke risk, heart failure, and cardiovascular disease. Therefore, an effective lifestyle changes and proper medication adherence are important for reducing HTN complications as well as control BP of hypertensive patient<sup>28</sup>. Effective care and plan to HBP is important through increase the patients awareness, information, life style modification, evidence about control and prevention of hypertension are associated with improve compliance to a higher rate and consequently decrease complications of hypertension as well as improve health outcome.

##### **Aim of the study:**

To examine effectiveness self-management program on knowledge, medication adherence and blood pressure control among hypertensive patients.

##### **Research hypotheses:**

H1: Mean score of hypertension knowledge will be statistical higher post intervention than pre intervention.

H2: There is a significant improve for patient's compliance to treatment regimen post implementing of the program.

H3: There is a significant statistical difference between pre and post implementing of the program regarding blood pressure control.

## 2. Subjects and methods:

### Study design:

This study was designed as a quiz experimental study using pretest – posttest design to examine effectiveness self-management program on knowledge, medication adherence and blood pressure control among hypertensive patients.

### Setting of the Study:

The study was conducted in the hypertension outpatient clinic in Mansoura University Hospital (MUH) and Fayoum University Hospital (FUH), Egypt.

### Subjects of the Study:

A Convenience sample of 50 adults' hypertensive patients constituted the study subjects. **Inclusion criteria:** over eighteen years old, diagnosed with hypertension (less than one year) and presenting the outpatient clinics. **Exclusion criteria:**

Patients who had hypertension complications or any other chronic disease were excluded from the study.

### Tools:

Data collection tools consisted of: Demographic and medical history tool, Compliance to high blood pressure therapy, Knowledge assessment tool, and Physical assessment tool.

### I- Demographic Data Sheet:

This tool was developed and tested by the researcher after extensive review of related literature. It was written in simple Arabic language and covered sex, age, marital status, occupation, educational level, residence and income, living condition, co-morbidity disease and duration of illness.

### II. Knowledge Assessment Questionnaire:

This questionnaire was designed by the researcher to evaluate baseline knowledge of patients about hypertension and therapeutic regimen; it was used as pre and posttest. It consists of three main parts.

The first part includes patients' knowledge regarding his/her understanding to nature of the disease (definition, types, normal values, complications etc.). The second part deals with patients' knowledge related to risk factors and their consequences, and the third part is related to patients' level of knowledge regarding treatment principles and the way of compliance with treatment regimen. The same questionnaire was used after teaching sessions and after 3 months to obtain comparable means of knowledge level.

### Scoring system of knowledge assessment tool:

The knowledge tool was coded: one (1) for the correct answer, two (2) for wrong and three (3) for don't know or missed.

### III. Hypertension and Medication Adherence Scales:

The Hill-Bone Compliance to High Blood Pressure Therapy Scale. The scale assesses patient behavior domains of high blood pressure treatment. It constructed by Kim et al.<sup>29</sup> and adopted by researcher to assess patient's compliance through three behavioral domains include: 1) reduced intake of salty foods; 2) follow up and prescription refills; and 3) medication taking.

The scale is composed of 14 items in three subscales; each item is a four-point likert type scale response from never (1) to all of times (4). It consists of three domains in high blood pressure treatment include: 1) Medication Adherence (9-items). 2) The dietary low sodium intake (2-items) 3) Regular follow up (3-items). This scale using to assess patient's self-reported compliance through summed the total score ranges from 14 to 42. The higher score, the higher is the non-compliance rate (negative score).

### IV-The Physical Assessment Sheet:

This sheet was designed to record patient's blood pressure using a standard method of measurement.<sup>30</sup> Also, it was included height and weight and body mass index.

### Validity and reliability:

The content validity was established for tools by seven expertise's in the field of nursing and medicine, who reviewed the tools for comprehensiveness and clarity. Also reliability testing internal consistency methods, Cronbach's alpha reliability of tool II and III was 0.89, 087.

### Pilot study:

A pilot study was conducted on five hypertensive patients who attended to outpatient clinic selected from the previous study setting this aimed to ensure the relevance, clarity, and applicability for implementation and modifications were applied according to the results of pilot study as well as determine the time needed for completing of the tools. Subjects who included in the pilot study were excluded from the main study sample.

### Ethical considerations:

Verbal consent was obtained from each patients prior to inclusion into the study after explain the nature and purpose of study. The investigator emphasized that participation is voluntary and confidentiality of data for each of the subject's and the participant have right to withdrawal at any time of the study.

**Procedures:**

The study was accomplished throughout four phases namely assessment, planning, implementation, and evaluation.

**Assessment phase:**

During this phase, collect patient's data and identify individualized learning needs as well as abilities to design the self-management program. Clarification of the nature and objectives of the study were done. The informed consent was obtained from all patients and the researcher confirmed the willingness of the patients to participate before inclusion in the study. Also, the patients were divided into five groups (10 patients) for each session.

**Planning phase:**

Self-management program were sophisticated based the findings of the literature review. This program was designed to improve patient's knowledge and adherence to medication and control blood pressure. As well during this phase, the researcher developed self-management program that concentrate on the lifestyle modification for hypertensive patients to lower blood pressure (BP). The intervention was designed based on literature and the patients' needs. The intervention about hypertension knowledge included the following items such as definition of hypertension, etiology and risk factors, signs and symptoms, complication and nursing management and appointment for follow up. The section of diet must be included healthy diet such as beetroot and green vegetables and fruit, avoid fatty diet and restrict salt in diet. Also, section of exercise covered the importance of physical activities like walking and yoga through suitable time and duration in ordered to improve circulation and promote muscle relaxation and imaginary technique.

Also, intervention must be covered types of treatment for hypertension, importance of compliance and regular follow-up with physician, and the signs and symptoms that need rapid consultation. Finally, life style modification practice which emphasized on health diet, stress management, stop smoking, maintain healthy weight, exercise daily at least walking 30 min per day and take medication according schedule. All of these items were putted in handout to help the patient to increase awareness as well as improve compliance.

The program consisted of 4 sessions including theory and practice using different teaching strategies (lecture, group discussion, demonstration and real objects). Through two days/week from 9.00 a.m. to 2.00 p.m., the program was implemented according to subjects' readiness. It included four sessions, the first session included introduction into teaching session and pre assessment of hypertension knowledge and medication adherence using knowledge assessment

tool and compliance to high blood pressure therapy scale, and lasted about two hours. The second session about definition of hypertension, types of hypertension, causes, risk factors, signs and symptoms, and complication. The third session covered the discussion about lifestyle modifications and effective plan to improve the compliance to treatment regimen. The schedules of Dietary Approach to Stop Hypertension (DASH) diet were also explained and plan for walking on treadmill according to the interval training pattern, which carried 4 weekly for one month were explained during this session.

Regarding practical sessions it were around two sessions according to patients or their relatives' readiness for learning the skill about measuring blood pressure, each session take at least 35 minutes for learning procedure of measuring blood pressure (BP) throughout the following instruction: 1) Participants were comfortable rested for 10 minutes and relaxed and crossed the leg during measuring. 2) The blood pressure of the hands was measured by mercury sphygmomanometer, and the upper arm in the level of the heart and the arm are resting on flat surface, 3) Put blood pressure cuff nearly 2-3 cm above the elbow, 4) Switch on of the blood pressure monitor, 4) Inflate the monitor cuff manually, 5) reading the results and record it. Also, measuring body weight, give instruction to empty bladder, the subjects take off shoes and keep thin clothes and ask to stepping on weight scale and record and sharing the result with the patient. Learn to be accurate determine the next follow up schedule. The researcher keeps continuous contacts with the patients through phone for providing advice, refreshing knowledge and answer any questions for the patient during follow up time.

**Evaluation phase:**

Three assessments were conducted for each patient in the study; 1<sup>st</sup> (pretest) was at the beginning of the study for filling tool assessment questionnaire. Second assessment was conducted at the end of 4 weeks after self-management program to determine the effectiveness of provided intervention on patient's level of knowledge and skills and overall compliance for the therapy (Figure 1).

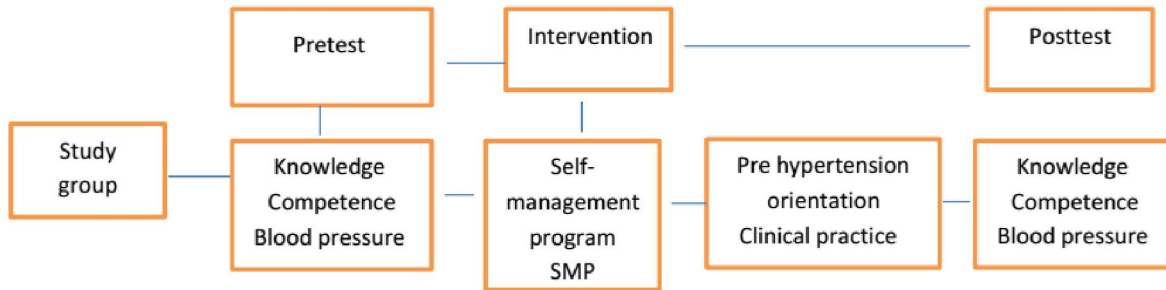
**Statistical Design:**

All of the statistical analysis was done using SPSS Version 19. The data entered and numbered are presented as means  $\pm$  SD standard deviations and ANOVA test was used for study variables. Person X2 test were used for comparison of percentages for the sample. Also, paired t-test was used for comparison before and after self-management program implementation. Correlation coefficient (r- test) using to correlated between some variables and knowledge with adherence to medication was done for all the tests.  $P \leq 0.05$  was regarded significant.

**3. Results:**

**Table (1)** showed that nearly three fifths of the studied sample aged between 40-60 years, while the minority of them (22%) aged 60 years and more. Slightly more than two thirds of patients were males (66%), the most of the samples (70%) were married, while only 4% were divorced and 10% were single.

Majority of sample (86%) lived within a family, while the minority of them lived alone (14%). Regarding occupation, three fifths of patients were employed status. In relation to residence, nearly three fifths of patients (58%) lived in rural areas. Also, most of the sample nonsmoker (74%), while around one third was smoker.

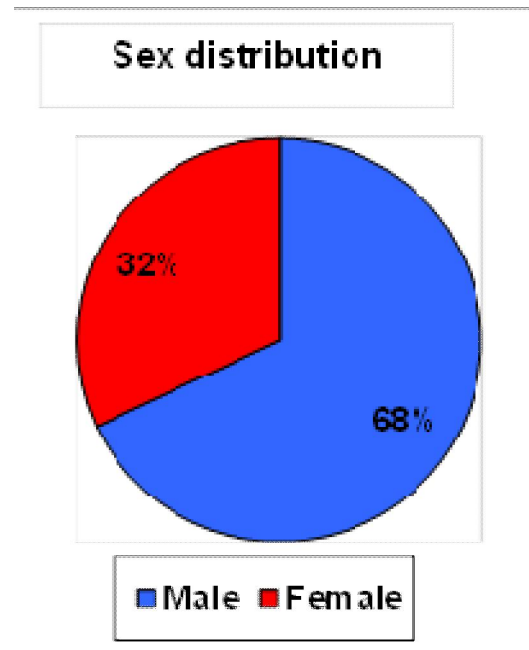


**Figure 1. Study chart**

**Table (1): Sociodemographic Characteristics of sample (N = 50)**

Patients' characteristic	No.	%
<b>Age in years</b>		
• <40	10	20.0
• 40-60	29	58.0
• > 60	11	22.0
<b>Marital status</b>		
• Single	5	10.0
• Married	35	70.0
• Divorced	2	4.0
• Widow	8	16.0
<b>Educational level</b>		
• Illiterate	3	6
• Read & Write	14	28
• Secondary	17	34
• University	16	32
<b>Occupation status</b>		
• Employed	29	58
• Unemployed	7	14
• Retired	14	28
<b>Residence</b>		
• Rural	30	60
• Urban	21	42
<b>Living system</b>		
• Living with family	43	86.0
• Living alone	5	14.0
<b>Smoking status</b>		
• Smoker	13	26
• Non Smoker	37	74

**Fig 2.** Represents that more two third were male (68%) while one third (34%) were female in the study subjects.



**Fig. (2): Distribution of patients characteristics regarding age**

**Fig 3.** Distribution characteristics of sample regards family history of hypertension. It is points that less than half of the studied sample (46%) had a positive history of hypertension, while 54% had negative history, but has history of any other disease.



### Family History of Hypertension

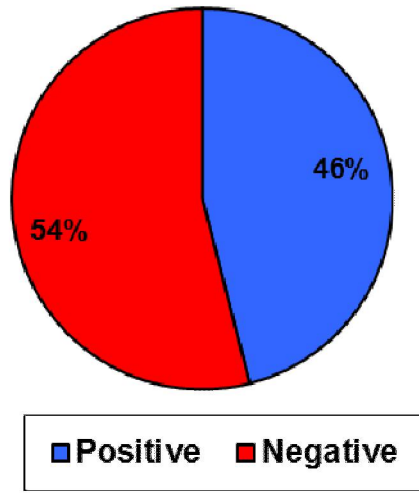


Fig. (3): Distribution of family history of hypertension.

Table (2): There was a statistically significant improvements in correct knowledge regarding to hypertension (nature causes, risk factors,

complication, nursing management, and treatment post program implementation compared to pre and follow up of program (73.7% to 48.8% & 45.88% respectively at  $p < 0.001$ ), this attribute that means of total knowledge hypertension and medication adherence increased from before and follow up of implementing the program are presented in Fig. 4.

Table (3): This table reveals that frequency of full compliance to medication taking increased significantly from 50.0% pre-program to 80.0% post program,. Regarding diet, frequency of full compliance to low dietary salt improve significantly from 48% preprogram to 84 % post- program. Also, regular follow up, improve full compliance from preprogram to post- program (76% to 92%). The differences were statistically significant ( $p < 0.0001$ ).

Table (4): This table shows that there was a slight decrease in systolic blood pressure and diastolic blood pressure post program (140/88) relative to preprogram (155/94). These differences were not proved to be statistically significant ( $p < 0.005$ ). As well there was no change in body mass index post program when compared to preprogram implementation.

Table (2): Comparison of mean knowledge scores before, and after teaching sessions and in follow up after 3 months.

Items	Pre program	Post Program (4 weeks)	p-value
	M ± SD	M ± SD	
Knowledge about nature of disease	26.78±4.6	16.86±1.55	<0.001
Knowledge about causes, risk factor & complication	17.38±3.29	11.12±1.00	<0.001
Knowledge about treatment regimen	29.54±4.32	20.82±1.56	<0.001
Knowledge about diet & exercise	18.95±3.57	29.16±4.38	<0.001
Total	73.7±9.69	48.8±3.16	<0.001

\*Significant:  $p < 0.05$

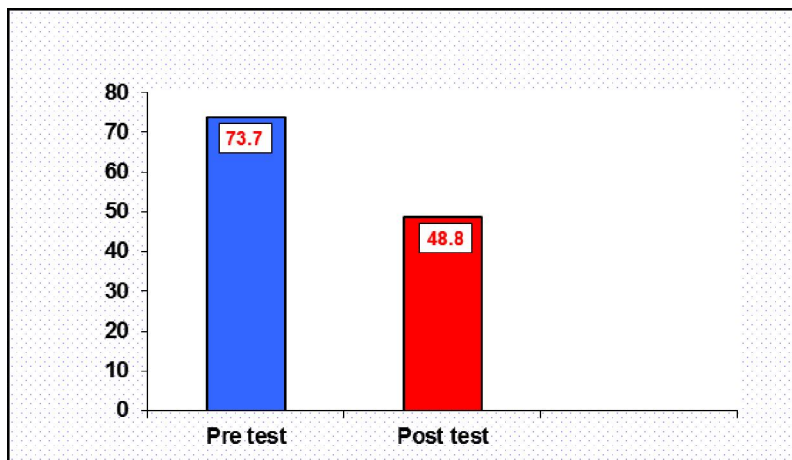


Fig. 4: Mean knowledge score pretest and posttest of program

**Table (3):** Distribution of all responses to Hill-Bone Compliance Scale in relation to medication taking, low dietary salt and follow-up, pre and post- program.

Hill- Bone Compliance items	Pre program		Post program		p- value
	No	%	No	%	
<b>Compliance to medication taking:</b>					
• Full compliance	25	50.0	40	80.0	<.05
• Partial compliance	17	34.0	5	10.0	<.05
• Poor compliance	6	12.0	5	10.0	>.05
• Non compliance	2	4.0	0	0.0	>.05
<b>Compliance to low dietary salt:</b>					
• Full compliance	24	48.0	42	84.0	<.05
• Partial compliance	18	36.0	6	12.0	<.05
• Poor compliance	7	14.0	2	4.0	>.05
• Non compliance	1	2.0	0	0.0	>.05
<b>Compliance to regular follow up:</b>					
• Full compliance	38	76.0	46	92.0	<.05
• Partial compliance	9	18.0	4	8.0	<.05
• Poor compliance	3	6.0	0	0.0	>.05
• Non compliance	0	0.0	0	0.0	>.05

\* Differences are statistically significant (p<0.05)

**Table (4):** Distribution of hypertensive patients according to effect of compliance to treatment regimen on their blood pressure value and BMI pre/post implementing the program

Variables	Pre program	Post program
	Mean±SD	Mean±SD
• SBP (systolic blood pressure)	155±12.8	140±10.7
• Diastolic blood pressure	94±7.6	88±6.01
• Height	166.6±8.9	166.6±8.9
• Weight	90.40±19.4	90.2 ± 18.8
• BMI (body mass index)	27.1±5.7	27.4±5.4

**Table (5):** Correlates between Hill-Bone, knowledge scores and different research variables post program implantation

Items	Hill-Bone	Knowledge
<b>Age:</b>		
• < 40	41.50+12.98	47.29+1.38
• 40-60	46.00+5.29	49.52+3.69
• >60	44.82+6.45	49.09+3.02
P value	1.315	0.045
<b>Sex:</b>		
• Male	44.26+9.60	65.71+8.23
• Female	44.94+5.25	60.67+12.08
P- value	0.068	0.145
<b>Educational level</b>		
• Non education	72.00+6.24	49.00+1.00
• Education	67.12+2.26	47.88+3.59
P- value	0.403	0.816

**Table (5)** shows that there was a statistical significant relation between age and Hill-Bone

compliance score (p<0.05). The score decreased significantly with increase age, where the lower the

score leading the higher in the compliance rate. However, other demographic characteristics were not proved to be statistically significant ( $p > 0.05$ ).

**Table (6)** illustrates that the correlation between medication adherence and (knowledge & practice) among the study group post-program implementation. It reveals that there is a positive significant statistically correlation between medication adherence and practice ( $r = 0.294$ ,  $p < 0.05$ ). Also, there were positive statistically correlation between medication adherence and knowledge ( $r = 0.993$ ,  $p < 0.05$ ).

**Table (6):** Correlation between medication adherences as measured by Hill-Bone compliance and knowledge & practice among the study group post program implementation

Research Variable	Overall H-B (n=50)	
	R	P
• Knowledge	0.993	0.01*
• Practice	0.294	.039*0

#### 4. Discussion:

Hypertension (HT) is a major public health problem worldwide, affecting nearly one billion people<sup>31</sup>. Management of hypertension is a critical public health issue. Inadequate control blood pressure among the majority of hypertensive patients contributes significantly to poor compliance. The role of health care provider is to improve patients' compliance to a higher rate using different strategies. Patient teaching is the most effective strategy and the cornerstone for any successful intervention addressed to improve compliance.<sup>32</sup> so, the purpose of this study was to determine the effectiveness of self-management program on knowledge, medication adherence and blood pressure control among hypertensive patients.

The current study revealed that more than two third of the study groups were males. This result agreement with study by Mozaffarian et al. showed that males have a higher incidence of hypertension compared to females of the same age.<sup>33</sup> Similar study by Reckelhoff found that the prevalence of hypertension is higher in men than women until after menopause<sup>34</sup>. On the other hand, longitudinal study conducted on 15,701 participants found that hypertension prevalence is highest in older populations<sup>35</sup> In contrast study by Akoko et al. who found that socio-demographic regarding gender more than half of study group were female.<sup>36</sup>

In relation to age, our study showed that more than two fifths of the study were aged ranged between 40-60 years. This result supported by the work of Lineo and co-worker who concluded that the highest incidence of hypertension occurs in old age (41-50).<sup>37</sup> In contrast randomized control trail study by Stewart

et al. found participants were aged 55 to 75 years. In relation to residence, results of this study revealed more two fifth of the study were rural area.<sup>38</sup> These findings agreement with a study by Murthy et al. showed rural respondents constituted 77.6% of the sample<sup>39</sup>.

In the present study family history is an important non-modifiable risk factor for hypertension positive family history with hypertension presented among slightly lower half of sample, while more than half are negative history with hypertension but genetic with other chronic disease. This supported by a study of Goldstein and co-worker showed that the prevalence of hypertension was significantly elevated with a family history of hypertension<sup>40</sup>.

In the current study, a majority of patients were lacking of knowledge regarding to hypertension at different aspects such as hypertension nature, etiology, sign and symptoms, management, treatment regimen and diet and exercise. i.e. Information and health education is a key important for these patients. This findings supported by cross-sectional study of Al-Sowilem and Elzubier conducted on 190 hypertensive patients conducted at primary health care centers in Al-Khobar, Saudi Arabia, who found that a most of patients have a lack of knowledge about hypertension and treatment regimen<sup>41</sup>. Also, Jarelnape et al. showed that hypertension patients In Sudan - White Nile State had average or poor knowledge about hypertension before health education program and significant improvement of the patients' knowledge after program at different aspect of hypertension ( $P < 0.001$ ).<sup>42</sup> These findings in line with cross sectional study by Sarkar et al. among 400 hypertensive patients, inadequate knowledge about hypertension and its treatment and complication.<sup>43</sup> A similar results was noted in studies in FAMILONI; Drevenhorn, who found inadequate knowledge of hypertension in patients with hypertensive and its impact on drug compliance.<sup>44,45</sup>

The current study findings show that improvement in compliance rate to hypertension regimen after the self-management program. Less than one-third of patients fully complied preprogram, increased into two third full compliance post program. Non-compliance dropped from fifteen percent preprogram into two percent post program. These attributed to the total compliance for all hypertensive regimens statistically significant improved, in which due to that self-management program cover the patients' needs. In a cross-sectional study conducted on 303 patients,<sup>46</sup> these study findings to assess the patient's knowledge and awareness about hypertension and adherence to drug, found the most of participants had poor drug compliance related to inadequate knowledge about hypertension. This is in line with study by Paulsen and colleagues, showed that



knowledge of hypertension and compliance rate to treatment was low. This may be most of patients with poorly controlled blood pressure (BP) were more likely to have multimorbidity<sup>47</sup>. Another study by Palanisamy and Sumathy showed that improvement in their compliance to hypertensive regimen after education and awareness about hypertension and its treatment and life style change<sup>48</sup>. These findings supported by previous study by Gupta and co-worker among 40 patients using pretest and posttest after program about hypertension and its complications, found that improvement in compliance to antihypertensive medications after health education of the patients about hypertension and its complications<sup>49</sup>.

As regards body blood pressure, there was slight reduction in systolic and diastolic blood pressure with no statistically significant. This attributed to blood pressure control associated with sum of factors such as drug adherence and life style modification. These finding supported by Bernardino et al. who showed that enhanced knowledge about hypertension could improve not only adherence to treatment but also provide adequate control of blood pressure<sup>50</sup>. On the another hand, a study done by Mancia et al. showed that patient health education about hypertension and measuring blood pressure practice was effective in decreasing systolic and diastolic blood pressure in hypertension population<sup>51</sup>.

The present study results demonstrated marked improvement in compliance rate to hypertension regimen after the educational program. Less than one-third of patients fully complied preprogram, increased into two third full compliance post program. Approximately, one quarter of patients have poor compliance preprogram decreased to eight percent post program. Non-compliance dropped from fifteen percent preprogram into two percent post program. This means that, total compliance to all hypertensive regimens significantly improved. This could be due to that the educational program is based on patients' needs. These findings in accordance with a study by Mert et al. showed that education program (knowledge, support and supervision of nurses) had positive effective on lifestyle changes and medication adherence and significantly prevent complications in hypertensive patients after program implementation<sup>52</sup>.

The relation of knowledge and compliance was examined in the present study; the findings showed that, there is a statistically significantly positive relation between knowledge score and compliance score. The higher the knowledge score the higher is compliance score. This is in agreement with a study by Hill et al. who established better education including both verbal and written instructions, supporting patient self-management leading to improvement in

compliance and blood pressure control<sup>53</sup>. Also, similar these findings study by Tong et al. reported that improve compliance with additional information about disease<sup>54</sup>.

### 5. Conclusion and recommendations:

Findings of the present study showed that self-management program improvement was detected in patients knowledge and compliance to therapeutic regimen and blood pressure (BP) after implementing educational program. Age of patients significantly correlated with compliance rate. While, there are no statistical significance between other socio-demographic and compliance with treatment. Future studies conducting to provide health program a routine care for hypertensive population in the study setting and similar clinical areas. Also regularly plan interventions to support and improve long-term compliance and BP control.

### Conflicts of Interest:

The author declares that there is no conflict of interest statement.

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### Reference:

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12/25/2018