Self-Awareness as A Tool for Reduction of Blood Pressure for Patients with Hypertension

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Abstract: Hypertension (HTN) is the leading and most important modifiable risk factor for heart diseases, stroke, renal diseases, and retinopathy. It is a common health problem in Egypt, its rates of awareness, treatment, and control are low. Efforts to control HTN have included increasing patients' knowledge and awareness, especially about the risks associated with uncontrolled blood pressure. **Themain objective** of this study was to evaluate effectiveness of self-awareness of hypertension as a tool for reduction of blood pressure. **The research hypothesis**; self-awareness of hypertension has a positive effect on the reduction of blood pressure. **The study subjects** consisted of 87 patients diagnosed with hypertension at the cardiac outpatient clinic at Ain Shams University Hospital. The tools of data collection were; 1) Structured interviewing questionnaire; to assess demographiccharacteristics and patient's health-related data, 2) Patient's knowledge assessment sheet, and 3) Hypertension self-awareness scale. **The results** showed that there were statistically significant differences for patients under study in relation to the patient's level of knowledge, self-awareness, and reduction of blood pressure throughout program implementation.**In conclusion**, improvement in the level of knowledge, self- awareness and reduction of blood pressure in patients under study was evident after improving self- awareness of hypertension. **Recommendation**:context studies with a wider scope and a larger sample size are recommended to confirm the results of this study.

Keywords: Hypertension, Self-awareness, Blood pressure

I. Introduction

Hypertension (HTN) is a common chronic disease in which blood flows through blood vessels or arteries higher than normal blood pressure[1]. It is diagnosed when systolic blood pressure above or equal to 140 mmHg and/or diastolic blood pressure above or equal to 90 mm[2]. It is considered a hallmark of obesity, diabetes mellitus, and metabolic syndrome not only the most modifiable risk factor for cardiovascular disease and stroke[3].

Worldwide, about one billion people have HTN with two-thirds of them occurring in developing countries[4]. In 2000; 26% of the adult population had HTN. It has been estimated that HTN is responsible for 4% of the global burden of diseases in both developing and developed regions[5,6]. Poorly controlled HTN is a major public health concern all over the world, with regard to morbidity, mortality, and economic burden[7].

Previous surveys from Egypt suggested that HTN is present in epidemic proportions throughout the country with exceedingly high rates concentrated in urban areas[8]. It is affecting more than 26% of adult Egyptians and more than 50% of individuals older than 60 years suffered from it[9]. If the same prevalence rates do not change, it is predicted that with an Egyptian population of more than 80 million, there will be approximately 15 million with HTN and about7 million will need lifelong drug treatment and regular follow-up. The problem is complicated by the low awareness rates, only 38% of hypertensive Egyptians aware of having HTN[10].

As mentioned by White, Duncan, and Baumle[11]HTN can be classified into primary (essential) HTN or secondary HTN. About 90% of patients with HTN belong to primary type, without an identified cause and is associated with aging, hereditary, eating habit, smoking, alcoholism, stress, fatigue, lack of exercise and obesity. The remaining 10% of cases are categorized as secondary HTN, which is secondary to other diseases such as chronic renal disease, thyroid disease, coarctation of the aorta, and pregnancy. Blood pressure will usually return to normal when the underlying causes are treated[12].

Hypertension (HTN) was called the silent killer because it has no clear symptoms. to indicate that something is wrong[13]. It progressively damages the walls of large arteries (aorta, carotids) as well as smaller ones (cerebral, coronary, renal, retinal) and makes it harder for the heart to pump blood through the body[14]. It can lead to heart attack or stroke, aneurysm, heart failure, renal failure, blindness, and cognitive impairment[15,16].

Lewis et al[6]stated that as blood pressure (BP) increases, so does increases the risk of heart diseases, and stroke. So, HTN is regarded as the most important preventable cause of heart disease and stroke by achievement and maintenance of blood pressure at or below 140/90 mm Hg[17,2].

The knowledge and awareness of the diagnosis as well as of the risk associated with uncontrolled HTN tend to enhance patients' adherence to medications[18]. It is important to assess the extent to which patients are aware of the importance of controlling their BP levels, as patient awareness and education is a part of programs and interventions designed to improve the control of HTN and BP[19].

Self- consciousness is an introspective process for understanding and knowing one's ideas, feelings, convictions and values[20]. It is also recognizing how external and internal events affect us and how we respond to them[21]. It takes time for people to develop insights into themselves and to evaluate what is meaningful for them in their lives; it is therefore important for successful career, decision- making and career management[22].

Self-awareness is often the first step in setting targets. It reduces the anxiety of clients, which affects the quality of care[23,24].The greater self-awareness is associated with higher adherence to antihypertensive treatments and BP control[25].

The significance of the study

Hypertension is a global public health problem[2]. It is a very common chronic disease in rural, urban and semi- urban areas of the world today that requires continuous life- long monitoring and treatment. In the 1990s, the National Hypertension Project (NHP) showed that hypertension among Egyptians is common. Uncontrolled with adequate and appropriate management, it causes serious health problems for patients such as heart attack, heart failure, stroke, renal failure, etc[9,26].

Despite improved hypertension management over this time period, Hypertension control in adult hypertension patients remains below the target of 62.1 percent for Healthy People at 2020. It is a major cause of premature death[4,27].

Self-awareness allows clients to make positive behavioral changes, which can lead to more personal and interpersonal success[24].Awareness of the diagnosis of HTN is an important determinant of treatment and medication adherence[28].It has shown that that greater awareness is associated with higher adherence to antihypertensive treatments and BP control[25]. Therefore, the present study contributes to evaluating the effectiveness of self-awareness of hypertension as a tool for reduction of blood pressure.

II. Material And Methods
The aim of the study:
The aim of the current study was to evaluatethe effectiveness of self-awareness of hypertension as a tool for the reduction of blood pressure.
Research hypothesis:
Self-awareness of hypertension has a positive effect on the reduction of blood pressure
Research Design: The quasi-experimental design was utilized to achieve the aim of the current study.
Setting: The study was conducted at the cardiac outpatient clinic at Ain Shams University Hospital.

Sample:87 patients with HTN were randomly assigned to the study. The rule of sum and sample equation based on information from relevant studies and the last year hospital admission statistics were used to determine the sample size of the study. The supple size was calculated according to the following statistical formula;

$$n = \frac{t^2 \times p(1-p)}{m^2}$$

n= required sample size
t= confidence level at 95% (Standard value of 1.96)
p= estimated prevalence of HTN
m=margin of error at 5% (Standard value of 0.05)

The researcher chose patients who fulfilled the following inclusion criteria: had a clinical diagnosis for HTN and their ages > 18 years, agree to participate in the study and able to provide written informed consent. Patients experiencing cognitive impairment, and alcohol or drug abuse were excluded from the study.

Tools for data collection:

1-   Structured interviewing questionnaire:

The researchers in the Arabic language developed it. It contains two parts:

A) Demographic characteristics of patients such as age, sex, marital status, level of education, and work status.

B) Health-related data as the duration of disease, blood pressure, body mass index, family history for HTN and smoking status.

BMI was estimated by dividing weight in kilogram by squared height in meters [BMI = weight (kg)/height (m)[2]]. A BMI of less than (18.5) was underweight, a BMI from (18.50 - 24.99) considered normal while a BMI from (25 – 29.9) considered overweight and ≥ 30 was considered obese[29].

2- Patient's knowledge assessment sheet

It was developed by the researchersin Arabic language after reviewing the related literature in order to assess patient's level of knowledge pre/post self-awareness program implementation in relation to definition of HTN, causes, risk factors, signs and symptoms, normal range, and management activities as diet, and exercise[2,12]. The reliability test was donewhereas Cronbach's Alpha equal 0.708

Scoring system:

Each correct answer had one mark while the incorrect one had zero.

The **total score was divided into three categories as follows:**

Less than 50% was graded as unsatisfactory knowledge.

More than or equal 50% < 70 was graded as satisfactory knowledge.

More than or equal 70% was graded as good knowledge

3- Hypertension Self-awareness Scale

The scale was developed by the researchersafter reviewing the related literature. It was designed to measure self-awareness for patients under study before and after implementing the self-awareness program. It was divided into 7 aspects ofactivities for hypertension. The questions used the 5-point Likert scale from strongly agree to strongly disagree[1,13].The reliability test was done whereas Cronbach's Alpha equal 0.807

Pilot study:
The pilot study was conducted on 10 patients in order toassess the clarity, feasibility, and applicability of the tools. Based on the result of the pilot study, modifications and omissions of some details were done and then the final forms were developed. The patients who included in the pilot study were excluded from the study sample.

Fieldwork
Before conducting the study, the administrative staff at Ain Shams University Hospital obtained permission and informed consent of the patients who were participating. The data collection period was for 12 months, starting from the beginning of November 2013 to the end of October2014. The study was conducted through threeconsecutive phases: interviewing and assessment phase, implementation phase, and evaluation phase.

Interviewing and assessment phase

During the first visit, the researcher emphasized the patient as a key element in controlling blood pressure through self-awareness as self-awareness is important for personal growth; it helps an individual to manage self and to improve performance.

Implementation phase.

In this phase, all recruited patients were interviewed individually by the researcher in thecardiac outpatient clinic to complete self-awareness. The obtained information used as the baseline assessment (pretest), then eighty-seven patients were divided into ten groups (7-9 patients) each group according to age, gender, and educational level. The number of sessions ranged from three to five sessions according to patients' awareness; each session lasted from 40-60 minutes.

The session started by measuring blood pressure, weight, and height, then the researcher starts self-awareness program.Self-awareness program addressed each patient's resources, possibilities and obstacles to achieving agreed priorities and goals. An instructional media was used; it included awareness of hypertension handout and audiovisual materials.

Evaluation phase

This phase was emphasized on estimating self-awareness of hypertension as a tool for reduction of blood pressure. Patients were reassessed at 3 months and then 6 months after implementation of self-awareness program.

Ethical and administrative considerations

An official permission was obtained from the Director of Ain Shams University Hospital and the heads of the departments in which the study was conducted. Written consent was obtained from each patient to participate in the study, after clarifyingthe aim of the current study for patients who met the inclusion criteria. Patients were informed about their right to refuse participation and to withdraw at any time without any consequences. Confidentiality of data was ensured.

Statistical analysis

Data were coded and transformed into a specially designed format suitable for computer feeding. All entered data were verified for any errors. Data were analyzed using statistical package for social sciences (SPSS) version 20 windows and were presented in tables and graphs. Chi-square analysis was performed. Also, mean and standard deviations were computed. Regarding P value, it was considered that: non-significant (NS) if $P > 0.05$, Significant (S) if $P < 0.05$.

III. Result

Table (1): Number and percentage distribution of socio-demographic characteristics among patients under study, n= 87.

Items	No.	%
Age (years):		
< 40	9	10.4
≥ 40 < 50	21	24.1
≥ 50	57	65.5
Mean±SD	55.43±11.75	
Gender:		
Male	30	34.5
Female	57	65.5
Marital status:		
Married	53	60.9
Unmarried	34	39.1
Education:		
Illiterate	35	40.2
Read/write and Basic/intermediate	34	39.1

|		
High	18	20.7
Work status:		
Work	49	56.3
Not Work	38	37.7

Table (1): illustrates the socio-demographic characteristics of the patient under study. According to the table, the mean age of the studied group was 55.43±11.75 years. Additionally, approximately two-thirds of the patients under study were female (65.5%), and more than half of them are working (56.3%). Three-fifths of the patients were married (60.9%) and two-fifths of them were illiterate (40.2%) compared with one fifth were highly educated (20.7%).

Fig. (1): Number and percentage distribution of body mass index among patients under study.
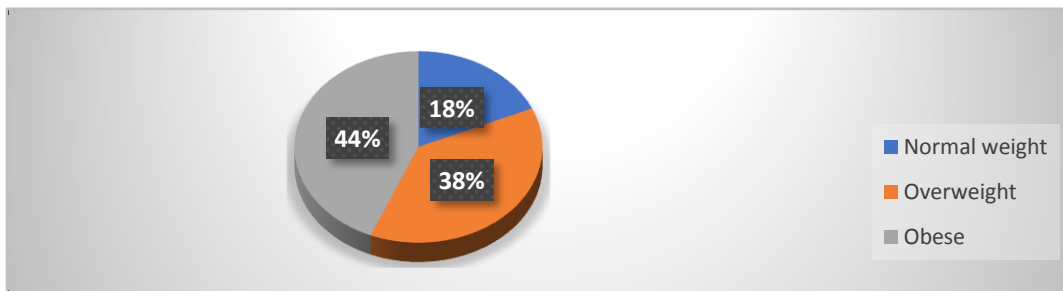
The above figure illustrates that less one-fifth of patients were a normal weight (18%) and more than two-fifths of them were obese (44.0%).

Fig. (2): Family history of HTN among patients under study.
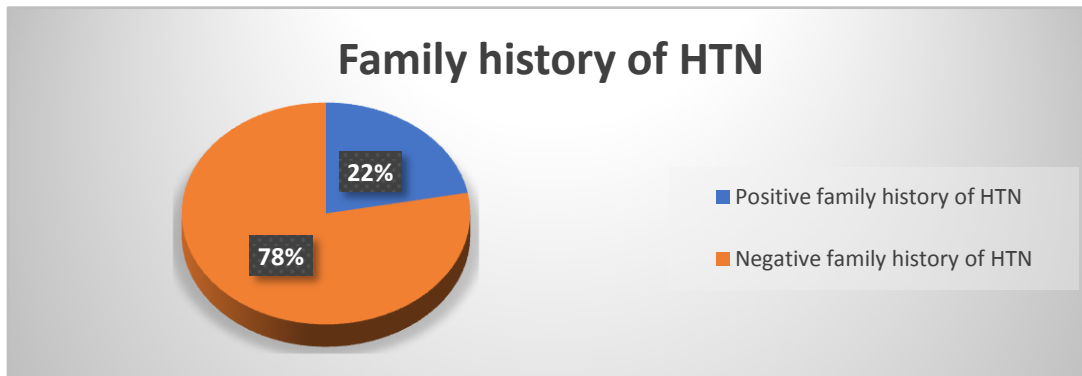
The results in figure (2) revealed that22.0% of patients included in the study had a positive family history of HTN.

Table (2): Number and percentage distribution of disease duration, comorbidities and smoking status among patients under study, n= 87.

Items	No.	%
Duration of disease: (In Years):		
< 5	23	26.4
5 -	38	43.7
> 10	26	29.9
Comorbidities	**43**	**49.4**
Heart diseases	13	30.2
Diabetes	21	48.8
Kidney diseases	9	21.0
Smoker	**21**	**24.1**
Non-smoker	**66**	**75.9**
Passive smoking:		

Exposed	15	22.7
Not exposed	51	77.3

Table (2): shows that approximately one-third of patients had HTN from more than ten years (29.9%). The table also illustrated thatless than half of patients under study had comorbidities(49.4%) and less than half of them had diabetes mellitus (48.8%). Regarding smoking status,three-quarters of patients were non-smokers (75.9%) and more than one-fifth of them was exposed to passive smoking (22.7%).

Fig. (3): Effect of self-awareness of hypertension for patients under study on their level of knowledge.
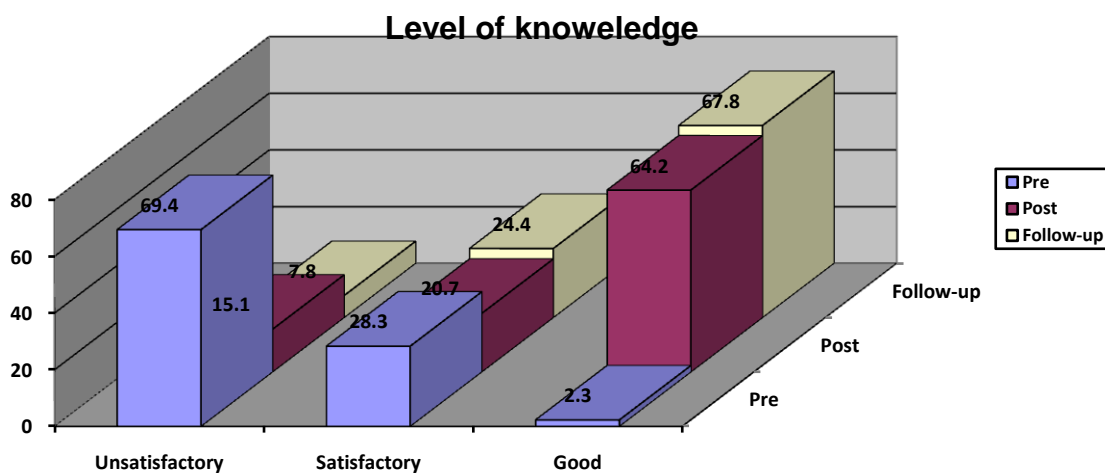

Fig. (3): Regarding the level of knowledge, there were statistically significant differences among the study group regarding the level of knowledgepost-self-awareness program implementation (P<0.001).

Fig. (4): Blood pressure level for the studied patients pre and post self-awareness program.
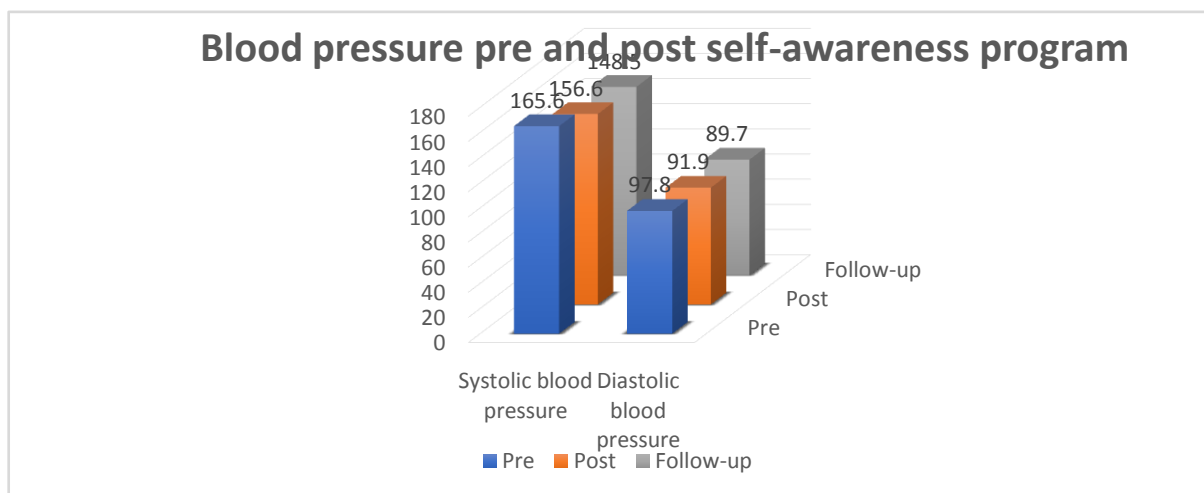

Figure (4):shows a statistically significant difference among the study group regarding blood pressure post-self-awareness program implementation (P<0.001).

Table (3): Self-awareness of patients under study pre and post-program implementation.

Items	Studied group n = (87)			P value
	Pre	Post	Follow-up	
Self-awareness of:				
Diet	24.0±3.29	26.0±3.48	33.2±2.84	0.000*

Exercise	1.6±0.20	3.8±.217	5.8±0.18	0.000*
Treatment	11.0±2.58	15.6±2.14	20.2±2.42	0.000*
Self-monitoring	2.13±2.07	4.79±1.51	6.77±1.73	0.000*
Stress management	15.6±3.76	23.1±3.18	29.3±2.90	0.000*
Smoking cession	2.7±1.46	4.0±1.88	5.0±1.64	0.000*
Follow up	4.3±1.44	6.3±1.37	6.6±1.34	0.000*
Total self-awareness	61.7±9.85	83.9±8.49	105.2±8.17	0.000*

* Significant

The results in a table (3) shows statistically significant differences regarding self-awareness of diet, exercise, treatment, self-monitoring, stress management, smoking cession, and follow upand totalself-awareness.

Table (4): Correlations matrix between patients' self-awareness and levels of knowledge, systolic and diastolic blood pressure throughout phases of program implementation.

Items	Self-awareness (n=87)		
	Pre	**Post**	**Follow-up**
Level of knowledge:			
Pre	--	.728**	.730**
Post	.728**	--	.707**
Follow-up	.730**	.707**	--
Systolic blood pressure:			
Pre	--	.751**	.742**
Post	.751**	--	.744**
Follow-up	.742**	.744**	--
Diastolic blood pressure:			
Pre	--	.741**	.732**
Post	.741**	--	.730**
Follow-up	.732**	.730**	--

* Significant

The previous table indicates that there were statistically significant positive correlations between patients' self-awareness and level of knowledge, systolic and diastolic blood pressure.

IV. Discussion

HTN is the commonest non-communicable disease affecting both sexes in all races. It poses a major danger to the development of many chronic diseases, particularly cardiovascular and neurological diseases[30,31]. Overall, 51 percent of strokes and 45 percent of deaths from ischemic heart disease are caused by high systolic blood pressure. National Hypertension of the Egyptian survey of adults conducted in six Egyptian governorates, and had been estimated the prevalence of hypertension as 26.3%[32,33]. While hypertension is common in developing countries, especially in urban areas, the awareness, treatment and control rates are extremely low[9]. Awareness of HTN, as well as the risk associated with uncontrolled HTN, is associated with higher adherence to antihypertensive treatments and BP control[25]. So, the aim of this study was to evaluate the effectiveness of self-awareness of hypertension as a tool for the reduction of blood pressure.

Part I: Socio-demographic characteristics and health-related data of patients under study

Findings of this study revealed that approximately two-thirds of patients were 50 years and more. This finding agreed with El Bcheraoui et al[34] who mentioned that the risk of hypertension increased with age. In the present study, approximately two-thirds of the sample were female. This finding is not corresponding withAgho et al.,[35] who carried out his study in Nepal. He reported that prehypertension and hypertension were higher in males compared to females.

In relation to patient education, the results of this study have been revealed thattwo-fifths of patients were illiterate and one of a fifth of them were highly educated. This finding was supported by Wei et al.,[36]who

stated thateducation level is a significant risk factor for hypertension. In the same contextMohamed et al.,[37] identified that most of the patients in his study were illiterate; this might be due to the role of education in health awareness.

Concerning body mass index, the findings of this study found that more than one-third of patients under study were overweight and more than two-fifths of them were obese. This finding is corresponding withEl Bcheraoui et al.,[34] who stated that obesity was a significant risk factor for hypertension.

Regarding family history of hypertension, slightly more than one-fifth of patients had a positive hypertension family history. This finding is corresponding with Miao Liu et al.,[38] who stated that a positive family history of hypertension has been associated with increased risk for hypertension.

The present study also illustrated thatless than half of patients under study had comorbidities and less than half of them had diabetes mellitus. This finding was supported by Mandal,[39] who stated thatcomorbidities such as, diabetes mellitus were found along with hypertension in the majority of patients.

In relation to smoking history, the present study results documented that, approximately one-quarter of participants were smokers and less than one-quarter of non-smokers were passive smokers. This finding agreed with Wei et al.,[36] who found that cigarette smoking for rural participants in China was a risk factor for HTN.

Part II: Effectiveness of self-awareness of hypertension

In this study, there was a statistically significant improvement in patients' knowledge. This might be related to the knowledge acquired from self-awareness program. The same finding was confirmed in other study carried out in Egypt by Mersal and Mersal[40] who confirmed that implementation of lifestyle guidelines for patients with hypertension helps improve patients' knowledge. In the same context Pawar et al.,[41]mentioned that patient counseling is effective in enhancing patient knowledge in the management of hypertension.

As regards self-awareness, there was a statistically significant difference among the study group regarding self-awareness of self-monitoring of blood pressure after implementation of self-awareness program. The results of the present study might be related to the knowledge and skills acquired from self-awareness program application. This finding was in accordance with Winter et al.,[42]who added that home- based self- BP monitoring can enhance awareness and understanding of concordance and lead to better management. In addition, result showed a statistically significant difference among the study group through the three phases of assessment which related to self-awareness of stress management. This difference in stress management found among the studied group might be related to self-awareness program application, patients after the program became more knowledgeable and had skills to avoid and manage stress. This was supported by Hu and Arao[43]who predicted that psychological distress for women with heart disease was improved after adopting a healthy diet and regular exercise.

The present study finding reported that there was a statistically significant difference among the study group throughout program implementation regarding exercise, which might be attributed to the self-awareness program implementation. This finding was in accordance with Mersal and Mersal[40] who reported that self-efficacy of exercise for Egyptian patients with hypertension was adequate for patients who exposed to evidence-based lifestyle guidelines.

In this study, there were statistically significant differences among the study group through the three phases of assessment which related to diet, treatment and smoking cessation. The result of the present study might be related to the knowledge acquired from self-awareness program application and desire of patients to avoid complications of high blood pressure and harms of smoking. This was supported by Warren-Findlow et al.,[44] who mentioned that the majority of African American participants with hypertension had statistically significantly increased odds of being adherent to medication regimens, using low-salt diet techniques, not smoking, and utilizing common weight management strategies.

Concerning sticking to follow-up for patients under study, this study finding showed that there was a statistically significant difference among the study group pre/post-self-awareness. This result might be related to the application of the self-awareness program and patient's hope of avoidance of complications of HTN. This finding was supported by Mersal and Mersal[40] who mentioned that self-care activity of follow-up for patients with hypertension improved at the end of her program.

Part III: Correlation between self-awareness and systolic and diastolic blood pressure.

Also result showed a statistically positive correlation between self-awareness and systolic and diastolic blood pressure. This finding clarified that when the level of patients' awareness improved, their systolic and diastolic blood pressure also improved. Ambaw et al.,[45] reported that the right knowledge about hypertension and its treatment creates a clear understanding and avoids confusion about the treatment and the disease condition. Knowledge about hypertension and its treatment was found to be positively associated with adherence behavior. Patients with better awareness were more likely to adhere to their treatment. In the same line, Hong,[46] identified that a variety of lifestyle modification interventions affect lower BP.

The main finding of this study was the success in implementing hypertension self- awareness, improved systolic and diastolic blood pressure of patients under study with statistically significant differences. This agrees with Park et al., [47] who found that the patient- tailored self- management intervention for nursing home residents with hypertension, integrated health education and individual counseling, was beneficial for a clinically significant decline in blood pressure.

V. Conclusion

The study concluded that; improvement in the level of knowledge, self- awareness and reduction of blood pressure in patients under study was evident after improving self- awareness of hypertension. Therefore, the present study findings support the hypothesis that self-awareness of hypertension has a positive effect on the reduction of blood pressure.

VI. Recommendation

Taking into consideration the results of this study, it is recommended that*:*

- Effort should be spent to improve self-awareness of patients with hypertension to improve their health and prevent complications of high blood pressure.
- Nurses have an active role in upraising self-awareness of patients regarding high blood pressure and its complications through videotapes, booklets, and posters.
- A simplified illustrated educational self-package should be given to the patients in order to improve self-awareness regarding treatment and non-pharmacological management for reducing blood pressure.
- Studies in similar contexts, but with a wider scope and a larger sample size, are recommended to confirm the results of this study.

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