
EFFECT OF EVIDENCE BASED LIFESTYLE GUIDELINES ON SELF-EFFICACY AMONG HYPERTENSION PATIENTS

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ABSTRACT

Background: Hypertension is a chronic disease affecting millions and causing millions of complications every year worldwide. People living with hypertension need to make several lifestyle adjustments, not only for treating hypertension but also for the prevention of other related chronic diseases. **Aim:** Evaluate the effect of evidence-based lifestyle guidelines on self-efficacy among hypertension patients in Port Said City. **Subjects and method:** A quasi-experimental design was utilized for conducting this study. **Setting:** The study was carried out at primary health care centers located in Port Said City. **subjects:** A purposive sample of 341 patients with hypertension recruited from randomly chosen six primary health care centers. **Tools:** Data was collected using three tools, **Tool I:** Self-Administered Structured Questionnaire divided into three parts namely: demographic data, patient' medical history, and knowledge assessment sheet, **Tool II:** Hypertension self-care activities scale and **Tool III:** Self-efficacy scale. **Results:** (4.4%) of the study group had satisfactory knowledge in the pre implementation phase while after implementation changed to (94.4%) of them had satisfactory knowledge. Nearly (4.4 %) of them had an adequate level of self-care activity while after implementation become (85.9%). About (2.6%) only had an adequate level of self-efficacy while after implementation become (97.9%). **Conclusion:** most of studied hypertensive patients had unsatisfactory knowledge, non-adherence to self-care activities and low self-efficacy toward their disease before implementation of evidence-based lifestyle guidelines, while the majority had satisfactory knowledge, adherence to self-care activities and high self-efficacy after implementation of guidelines with highly statistically significant difference. **Recommendation:** Apply evidence-based lifestyle guidelines more and more to cover all hypertensive patients to help them understanding the nature of their chronic disease and trying to cope without complications.

Key Words: Evidence based lifestyle guidelines, hypertension, self-care activity and self-efficacy

INTRODUCTION

Hypertension is defined as a medical condition in which the blood pressure in the arteries is elevated exceeding 140 over 90 mmHg. This elevation makes the heart work harder than usual to circulate blood through the blood vessels. Many patients suffer from this disease are not aware about this condition early because it is usually occurred without any symptoms. Hypertension takes a long time before diagnosed thereby causing major health problems as damage to organs as the brain and kidneys and so on are the long-term effect of hypertension disease. (Abd El-Hay and El Mezayen, 2015).

Hypertension is a major worldwide public health problem because of its high prevalence with vascular disease, premature death, stroke, renal diseases and retinopathy. (Adebayo¹, Rotkangmwa and Shalkur, 2015). International Society of Hypertension and National Blood Pressure Association have declared that more than 50 percentage of people with high blood pressure are not aware of their condition. Also, the success rate for controlling high blood pressure in the USA is just 27% and this rate in England, France and Germany is even lower (Lauffenburger, Shrank, Bitton, Franklin, Glynn, Krumme and Pezalla et al., 2017).

An Egyptian national survey conducted in 2012 showed a higher prevalence of various cardiovascular risk factors than did the global and regional figures, especially factors like increased body weight, physical inactivity, and low fruit and vegetable consumption. The prevalence of hypertension and tobacco use was also high, 39.7% and 24.4% respectively. (Schiffirin, Campbell, Feldman, Kaczorowski, Lewanczuk, Padwal and Tobe et al., 2016). Although hypertension is a preventable and treatable condition but without treatment it leads to serious and life-threatening complications such as heart, kidney and brain disorders which in most cases result in patient's disability (Lauffenburger, Landon and Fischer, 2017).

Continuous monitoring and evaluation of blood pressure could be an important step in successful control of hypertension. The goal of hypertension treatment is to prevent death and complications by achieving and maintaining the blood pressure at 140\90 mm hg or lower. Lifestyle modification is the first line of intervention for all patients with hypertension, but pharmacological treatment remains the cornerstone for disease management, reduction of blood pressure and prevention of complications such as cardiovascular and renal morbidity and mortality (Behzad, Bastani and Haghani, 2016; Hjornholm, Aamodt, Larstorp, Fadl Elmula and Hoiieggen, 2018).

The latest recommendations for prevention, detection, evaluation, and treatment of hypertension have considerably emphasized the individual's health promotion through the healthy modification of their lifestyle. The control of hypertension through health promotion and life style modification presents a significant challenge for a large segment of the population that is well suited to nursing care (Somayeh, Mohsen and Maryam, 2016). Lifestyle modification is the first step in the management and treatment of hypertension. Lifestyle is usually based on long-standing behavioral patterns, maintained by the social environment. A lifestyle is believed to be the cornerstone of prevention and should be promoted by all the healthcare providers with collaboration of the family (Kim and Kong, 2015). Additionally, lifestyle factors such as increased body weight, excess body fat, high consumption of dietary sodium, excessive consumption of alcohol, smoking and physical inactivity have been implicated in hypertension prevalence (Sarki, Nduka, Stranges, Kandala and Uthman,2015).

Evidence-based nursing practice has been the gold standard for nursing care delivery. Evidence based practice (EBP) incorporates current best evidence, individual clinical expertise and patient preferences in decision-making. Evidence-based clinical guidelines exist that are useful for health screening, health promotion, and the management and treatment of chronic conditions. (Varaei, Salsali, Cheraghi, Tehrani, and Heshmat, 2013). Use of an evidence-based practice (EBP) model can be an important aid to ensuring consistent patient care among providers, aid in the delivery of quality health care, and cost effectively improve patient outcomes (Harris, Lloyd, Krastev, Fanaian, Gawaine and Zwar , et al., 2014).

The application of evidence-based health promotion in dealing with hypertension is not only a definitive role for nurses practicing, but is also a major contribution to the science of nursing. It should be applicable in any settings including clinical and community settings. In the light of Evidence-based nursing practice, the nursing process is a universal nursing framework and also a unique way of thinking and acting for clients' care based on references (Breckenridge, Aronson, Blaschke, Hartman, Peck and Vrijens, 2017).

Guidelines of different organizations and countries consistently state that lifestyle modifications include weight reduction, adoption of fruits and vegetables in the daily diet, dietary sodium reduction, and physical activity, moderation of alcohol consumption, smoking cessation, and stress management. Current treatment guidelines for hypertension include antihypertensive medications and health-promoting lifestyle modifications(Chin, Twinobuhungiro, Sandhu, Hootsmans, Kayima, and Kalyesubula , 2017).

Self-efficacy is widely used as psychological concept that has been recognized as an essential prerequisite of effective care of chronic disease. Measuring the self-efficacy in patients with hypertension is an important step towards improving hypertension control in individuals or population level. The information gained from measurement of self-efficacy can help physicians or public health professionals to identify low self-efficacy and implement suitable interventions. (Hu, Li and Arao, 2013).

Community health nurses can play an important role in facilitating patient's self-efficacy to the prescribed treatment regimen. As they responsible to help patients gain knowledge, skills to live with and control hypertension (Mersal and Mersal, 2015).

Significance of the study:

Hypertension is a chief public health care in both developing and developed countries. It affects approximately I billion individuals worldwide. Hypertension is an urgent health problem in Egypt with prevalence rate of 26.3% among the adult population, its incidence increases with aging, around 50% of Egyptians over the age of 60 years have hypertension, besides, it was concluded that there are declines in the levels of awareness of hypertension and even lower levels of control (Alaa, Abdelazim, Emeash ,Hassan and Mustafa, 2014). Lifestyle behavior modifications are the first line of intervention for all patients with hypertension. It should be actively performed not only before but also after starting of antihypertensive medications to improve patients controlling outcomes. (Mersal and Mersal, 2015). Evidence-based nursing practice (EBN) has been the gold standard for nursing care delivery. It defined as the integration of the best possible research. The application of evidence-based health promotion in dealing with hypertension patient is not only a definitive role for nurses practicing, but is also a major contribution to the science of nursing. Therefore, the aim of this study is to evaluate the effect of evidence-based lifestyle guidelines on self-efficacy among hypertensive patients in Port Said city.

AIM OF THIS STUDY:

This study aimed to evaluate the effect of evidence-based lifestyle guidelines on self-efficacy among hypertension patients in Port Said City.

Objectives of the study:

1- Assess patient knowledge about hypertension.

- 2- Design a plan of evidence-based lifestyle guidelines on self-efficacy of patients with hypertension.
- 3- Implement a plan of evidence-based lifestyle guidelines on self-efficacy of patients with hypertension.
- 4- Evaluate the effect of evidence-based lifestyle guidelines on self-efficacy of patients with hypertension.

Hypothesis:

- Hypertensive patients, who would be exposed to the evidence-based lifestyle guidelines, would show improvement on their knowledge, self-care activities and self-efficacy after implementation of guidelines.

SUBJECTS AND METHOD**Study Design:**

A Quasi-experimental (pre-post-test) design was utilized in the current study.

Study Setting:

This study was confirmed at six primary health care centers which chosen randomly from seven districts located at Port Said city, namely: (Bahr El-Bakar from Elganoub district, Elgawharah from Elzohour district, Elkwait from Elmanakh district, El-Arab Medical center from Elarab district, Elkaboty from Eldawahy district & Elgarabaa from west of Port Said district). Even though El shark district not included in the study because it has not primary health care centers. These centers provide health services for hypertensive patients through chronic disease clinics such as history taking, vital signs measurement, lab investigations and follow up for hypertensive patients and given health education about their condition.

Subjects:

Subjects of this study consisted of patients diagnosed with hypertension (BP \geq 140/90) who were attending to chronic disease clinics in the previous selected primary health care centers in Port Said City.

Sampling technique:

A Cluster sample technique applied to recruit study subjects from six districts located in Port Said City. A simple random selection used to select one center from each above previous listed districts. A purposive sampling technique used to recruit the studied sample. A purposive sample used to select of hypertensive patients who were attending chronic disease clinic located at primary health care center in Port Said city, Egypt.

Sample size:

The sample size was determined by using the following equation (Charan and Biswas, 2013).

$$\text{Sample size} = \frac{Z_{1-\alpha/2}^2 p (1 - p)}{d^2}$$

Where:

$z_{1 - \alpha} \cdot 2 =$ apercentile of standard normal distribution by confidence level = 1.96

P=Expected proportion in population based on previous studies (prevalence of hypertension among adult patients =28% according to WHO (2017)

D: absolute error or precision (5%)

$$\text{Sample size} = \frac{1.96^2 \times 0.28(1-0.28)}{(0.05)^2} = 310$$

Assuming a 10% attrition rate:

$$10\% \text{ of } 310 = 31$$

$$310 + 31 = 341$$

The total sample size was 341 patients.

Methods for data collection:

Three main tools were used to achieve the purpose of the current study as following:

Tool I: Self-Administered Questionnaire:

This tool was adopted from Mahajan, Kazi, Sharma, Velhal (2012), It was translated from English language to simple Arabic language by English language expertise. it was comprised of three parts: Part I: concerned with demographic characteristics of

patients, it included 9 items such as age, sex, marital status, level of education... etc. Part II: concerned with patient's medical history, it included 13 items such as height, weight, body mass index, stage of hypertension ... etc. Part III: concerned with patient's knowledge assessment sheet (pre and post-test): It used to assess the level of patient's knowledge regarding hypertension in the pre implementation phase then used as post-test to evaluate the level of patient's knowledge after the implementation of the guidelines. It consisted of 17 items about hypertension, such as: definition of hypertension, normal range, types of hypertension ,causes, risk factors ,symptoms, complications, management activities , food that increase BP, food that lower BP, food increase weight ,effect of exercise, BP measurement ,effect of self-monitoring, effect of smoking ,effect of regular follow up and effect of relaxation technique.

Scoring systems:

The score one given for each correct answer and zero for incorrect answer. These scores where been converted into a percent score. The total knowledge considered satisfactory if the percent score was 60% or more and unsatisfactory if less than 60%.

Tool II: Hypertension Self-Care Activities Scale:(pre and post-test)

This tool adopted from Seymour, Shenk &Warren-Findlow, (2011) then modified by the researcher after revising of related literature review and opinions of expertise for content of validity. It translated from English language to simple Arabic language by English language expertise and was used to assess the level of hypertension patients' adherence for lifestyle modification in the pre-implementation phase there by evaluation of their level if adherence in the post implementation phase. This scale consisted of 35 items to assess seven aspects of activities for hypertension such as medication use, diet, physical activity, smoking cession, weight management, relaxation technique, self-monitoring and follow up. Every aspect has sub items and rated on a 5-point Likert scale (strongly agree, agree, neither, disagree and strongly disagree.).

Scoring systems:

The scoring of Self Care Activities for patients with hypertension was been converted into a percent score. Each item is rated on a 5-point Likert scale as: 5 = strongly agree, 4 = agree, 3 = neither, 2 = disagree and 1 = strongly disagree. The total Self Care Activities for patients with hypertension considered adequate if the percent score was 60% or more and inadequate if less than 60%.

Tool III: Self-Efficacy Scale :(pre and post -test)

The scale was adopted from Warren-Findlow, Seymour, & Brunner,-Huber, (2012), and Schwarzer & Jerusalem ,Generalized self-efficacy scale, 1995, then modified by the researcher after revising of related literature review and opinions of expertise for content of validity. It translated from English language to simple Arabic language by English language expertise. It used to measure the self-efficacy of the selected hypertensive patients before and after implementation of guidelines. The scale consists of 6 items to assess self-efficacy for patients with hypertension such as diet, medication, measurement, follow up, exercise and emotional distress. Each item rated on a 5-point Likert scale from very confident to not confident at all.

Scoring systems:

The scoring of Self-efficacy scale for patients with hypertension was been converted into a percent score. Each item rated on a 5-point Likert scale from 5 = very confident, 4= pretty confident, 3 = somewhat confident, 2 = not very confident and 1 = not confident at all. The total Self-efficacy scale considered adequate if the percent score was 60% or more and inadequate if less than 60%.

Validity of the study tools:

The instruments translated into Arabic and back translated into English, verifying whether the translation covers all aspects of the original English version of the questionnaire or not. To ensure the face validity of the final translated Arabic version of the questionnaires, experts who selected based on their qualifications and experience in nursing research and education evaluated the tools.

Reliability of the study tools:

The Cronbach α (coefficient was calculated to assess the reliability of the developed tool through their internal consistency). The Cronbach α for patient knowledge assessment tool was .861 and for hypertension self-care activity scale was .91 and for self-efficacy scale was 0.87 which exceeded the minimally acceptable standard of validity.

Pilot study:

A pilot study conducted on 10 % (34 patients) of the sample who excluded from the studied sample to test the clarity and applicability of the tools of the study and estimate the

time required filling in them. It carried out over a period of one month before embarking on the fieldwork of the study (from the beginning to the end of May 2019). The results obtained from the pilot study used to discover any difficulties that might be encountered by the participants in reading or understanding.

Fieldwork:

This study conducted through four successive phases: assessment, planning, implementation and evaluation. Data collection and implementation of guidelines lasted for about ten months from the beginning of July 2019 to the end of April 2020. The researcher visited the pre-mentioned settings 5 days per week from 8.30 am. to 1pm. Assessment phase consumed two months, planning phase lasted for one month, implementation phase and evaluation phase consumed seven months.

Phase I. (Assessment phase):

After preparing the tool and agreement approved to conduct this study, the researcher was beginning to collect data assembly and met participants who match the conditions. The study sample was recruited and collecting the data baseline. Pre-tested questionnaire administered to the study sample to assess their existing level of knowledge regarding hypertension, their level of self-care activities and their self-efficacy. The selected primary health care centers were visited four days/week from the beginning to the end of the work. The researcher introduced herself to the patients and took the oral consent of them to be recruited in the study after explaining the aim of the study. During the meeting, the researcher reads each item/question on a data collection sheet and explained its meaning to the patients. Then asked the patients and filled by the researcher. It took about (35-40) minutes.

Phase II (Planning phase):

The lifestyle guidelines content was prepared based on the identified needs and demands of patients gathered in phase (I), and in the light of the most recent pertinent literature. It included the following items: identifying of hypertension, normal value of blood pressure, classifications, its types, causes, risk factors, signs and symptoms, complications. It also covered the importance of self-efficacy and evidence based lifestyle practice which emphasized on eating sensibly, reducing salt, fat, caloric and sugar intake, regular follow-up with the physician, exercise regularly and reducing weight, stop smoking, compliance with prescribed medication and do daily aerobic exercise, the importance and the method of measuring blood pressure and practicing deep breathing exercises. Teaching

methods selected to suit teaching of small groups in the form of lectures, group discussion, brainstorming, demonstration, and re-demonstration to facilitate comprehension and integration of theory and practice. In addition, teaching media were prepared as power point presentations, CD films, colored posters, and booklet that covered theoretical and practical information.

Phase III (Implementation phase):

The guidelines for this study carried out in the teaching room affiliated to the pre-mentioned settings. The acceptance of participation was taken after explanation the purpose of the study. Moreover, the Patients grouped; each group included 2-3 patients. The guidelines consisted of 4 sessions; three of the sessions were theoretical about hypertension, lifestyle, self-efficacy and one session was practical. Each session lasted for around 30-35 minutes. It applied through different teaching methods, which included interactive lectures, discussion, instruction media as power point presentations and printed handout (booklet).

The first session covered items of overview about hypertension, definition, and normal range for blood pressure, types, risk factors, causes, symptoms, complications and treatment. This session took about 45 minutes.

The second session covered items of lifestyle modifications including medications adherence, diet, and physical activity and smoking cessation. This session took about 40 minutes.

The third session covered self-monitoring, follow up, self-efficacy and its positive effect. This session took about 35 minutes.

The fourth session was practical for training patients how to measure blood pressure and training about deep breathing exercises. This session took about 40 minutes.

- Instructional booklet was given to each patient to attract his/her attention, motivate his/her, and help for reviewing at home and support teaching at home. The instructional booklet consists of the guideline contents; it written in a simple Arabic language and supplemented by photos and illustrations to help the patient understanding of the content involved: definition, risk factors, incidence, signs and symptoms, preventive measures of hypertension, Pharmacological and non-pharmacological treatment and components of

healthy life style (dietary control, physical exercise, stress management and self-monitoring)

Phase IV (Evaluation phase):

The evaluation phase emphasized on estimating the effect of life style guidelines on patients' knowledge, self-care activities and self-efficacy of patients. The posttest conducted immediately for patients after implementation of the lifestyle guidelines; each patient in the study interviewed to evaluate knowledge using the same tools in pretest. The results compared to the pre-test results to evaluate the effect of evidence-based lifestyle guidelines on self-efficacy among hypertensive patients.

Administrative design: -

Before conduction of study, an official letter explaining the aim of the study was issued from the Dean of the faculty of Nursing, Port Said University to directors of primary health care centers to obtain their permission to conduct the study. Also an approval was taken from the participants themselves, after explanation to each of them the purpose of the study

Ethical Consideration:

An official approval was obtained from research committee at Faculty of Nursing, Port Said University. And an approval from primary health care centers directors to conduct the study was taken after explanation the aim and process of the study. An oral consent taken from each participant to participate in the study after explanation of the study aim and informed him or her that his/her participation was voluntary and they have the right to withdraw from the study at any time they wish to do. In addition, they were assured about confidentiality and anonymity of information gathered and that was used only for the purpose of the study.

Statistical Design:

Data fed to the computer and analyzed using IBM SPSS (Statistical Package Social Sciences) software program version 23.0. (Armonk, NY: IBM Corp) Qualitative data described using number and percent. Quantitative data were described using range (minimum and maximum), mean, standard deviation and median. A paired t-test was used to analyze the total scores of the participants responses on the pre-test and the post-test with $P < 0.05$ considered significant. Chi square test, Fisher Exact and McNemar test were used

to test the correlation between respondents' knowledge and socio-demographic variables. The significance level was reported and pre-settled at $p < 0.05$.

RESULTS:

It can be seen in **table (1)**, that 64.2 % of the studied sample aged 49 to more than 50 years. About 66.6 % were male. About 81.5% of the sample were married, 80.6 % of them living in urban area and 79.5% of them had family members ranging from three to six members. Also 24.9 % of the studied sample were illiterate and about 28.4% can read and write. About 53.4% of the studied sample worked as craftsmanship, 51.6% had not enough monthly income and 63.9% of them had no health insurance.

Table (2): illustrates that 59.2% of the studied sample were overweight with mean was 28.55 ± 3.05 . About 63.3% had hypertension stage I. In addition, 60.7% of the studied sample was not smoking and 54.3% had positive family history of hypertension.

Table (3): clarifies that only 4.4% had satisfactory about hypertension disease before implementation of the evidence-based guide line lifestyle while it became 94.4% after implementation of guidelines with high statistically significant difference between total mean scores pre and post at implementation stage at ($p < 0.001$).

Table (4): shows that there were statistical significance differences between pre and post implementation phase for all item of self-care activity scale with the lowest level of self-care activity was found in the same percentage 7.9% regarding weight management, relaxation technique and follow up, while the highest level 41.3% of self-care activities regarding medication use was detected in the pre implementation phase. However, after implementation phase, the lowest level of self-care activity was regarding smoking with 56% while the highest level of self-care activities regarding self-care activity of self-monitoring was 97.4%.

The comparison between total mean scores & percentage score pre and post hypertension self-care activities scale (H-scale) dimensions among the studied sample showed in **table (5)**. It was observed that 4.4% of the studied sample had an adequate level of total self-care activity before implementation of the evidence based lifestyle guidelines while after implementation became 85.9%, with high statistically significant difference between total mean scores pre and post at implementation stage at ($p < 0.001$).

In relation to self-efficacy assessment scale, demonstrated in table (6), that 2.6% had an adequate level of self-efficacy before implementation of evidence based lifestyle guidelines compared to 97.9% after implementation of guidelines.

Table (7): indicates that there was a highly statistically significant relation between self-efficacy with knowledge and Self-monitoring at ($p < 0.001$), while there was a statistical significant relation with physical activity, smoking, relaxation technique and follow up at ($p = 0.002$, $p = 0.019$, $p = 0.017$ and $p = 0.009$) respectively.

Table (1): Distribution of the studied sample according to socio-demographic characteristics: (n = 341)

Items	No.	%
Age		
30 - 39	12	3.5
40 - 49	110	32.3
50 +	219	64.2
Min. – Max.	35.0 – 67.0	
Mean ± SD.	51.56 ± 6.46	
Sex		
Male	227	66.6
Female	114	33.4
Marital Status		
Single	3	.9
Married	278	81.5
Widowed	42	12.3
Divorced	18	5.3
Site of residence		
Rural	66	19.4
Urban	275	80.6
Number of family members		
<3	12	3.5
3 - 6	271	79.5
>6	58	17.0
Min. – Max.	1.0 – 9.0	
Mean ± SD.	5.33 ± 1.39	
Level of education		
Illiterate	85	24.9
Primary/preparatory	97	28.4
Secondary	97	28.5
University	62	18.2
occupation		
Craftsmanship	182	53.4
Employee	111	32.6
Not Work	0	0
housewife	48	14.1
Monthly income		
Enough	165	48.4
Not enough	176	51.6
Health insurance		
yes	123	36.1
No	218	63.9

Table (2): Distribution of the studied sample according to their medical history
(n = 341)

Items	No.	%
Height		
Min. – Max.	160.0 – 187.0	
Mean ± SD.	171.62 ± 6.47	
Weight		
Min. – Max.	60.0 – 110.0	
Mean ± SD.	84.08 ± 9.88	
Body mass index (BMI)		
Normal	39	11.4
Overweight	202	59.2
Obese Class I	94	27.6
Obese Class II	6	1.8
Min. – Max.	22.58 – 38.06	
Mean ± SD.	28.55 ± 3.05	
Blood pressure		
Prehypertension	18	5.3
Stage I	216	63.3
Stage II	107	31.4
Smoking		
Yes	134	39.3
No	207	60.7
If smoking (n =134)		
Consumption of tobacco per day		
<10	3	0.9
10 - 20	92	27.0
>20	39	11.4
Min. – Max.	8.0 – 35.0	
Mean ± SD.	20.47 ± 6.32	
Number of years smoked		
<5	3	0.9
5 - <10	3	0.9
10 - <15	28	8.2
15 - 20	100	29.3
Min. – Max.	3.0 – 30.0	
Mean ± SD	18.46 ± 6.45	
Duration of hypertension		
<5	153	44.9
5 - <10	110	32.3
10 - <15	66	19.4
15 - 20	12	3.5
Min. – Max.	1.0 – 20.0	
Mean ± SD.	6.25 ± 3.98	
Family history of HIN		
yes	185	54.3
No	156	45.7
Associated chronic disease		
yes	98	28.7
No	243	71.3
Use of concurrent drugs		
yes	95	27.9
No	246	72.1

Table (3): Comparison between studied sample on pre and post total mean score & % score of knowledge (n = 341)

	Pre		Post		Test of sig.	p
	No.	%	No.	%		
Knowledge						
<60 % Unsatisfactory	326	95.6	19	5.6	McN = 305.003*	<0.001*
≥60 Satisfactory	15	4.4	322	94.4		
Total score						
Min. – Max.	0.0 – 15.0		7.0 – 17.0		t= 53.159*	<0.001*
Mean ± SD.	3.94 ± 3.45		14.68 ± 2.11			
% score						
Min. – Max.	0.0 – 88.24		41.18 – 100.0			
Mean ± SD.	23.15 ± 20.28		86.36 ± 12.39			

McN : McNemar test t: Paired t-test

p: p value for comparing between pre and post

*: Statistically significant at $p \leq 0.05$ **Table (4):** Comparison between studied sample on pre and post assessment of hypertension self-care activities scale (H-scale) dimensions (n = 341)

Items of Self Care Activities Scale	Pre		Post		McN	p
	No.	%	No.	%		
Medication use						
<60% Inadequate	200	58.7	15	4.4	183.005*	<0.001*
≥60 Adequate	141	41.3	326	95.6		
Low-salt Diet						
<60% Inadequate	296	86.8	146	42.8	102.782*	<0.001*
≥60 Adequate	45	13.2	195	57.2		
Physical Activity						
<60% Inadequate	311	91.2	34	10.0	275.004*	<0.001*
≥60 Adequate	30	8.8	307	90.0		
Smoking						
<60% Inadequate	278	81.5	150	44.0	98.348*	<0.001*
≥60 Adequate	63	18.5	191	56.0		
Weight Management						
<60% Inadequate	314	92.1	27	7.9	285.00*	<0.001*
≥60 Adequate	27	7.9	314	92.1		
Relaxation technique						
<60 % Inadequate	314	92.1	30	8.8	282.00*	<0.001*
≥60 Adequate	27	7.9	311	91.2		
Self-monitoring						
<60 % Inadequate	292	85.6	9	2.6	281.00*	<0.001*
≥60 Adequate	49	14.4	332	97.4		
Follow up						
<60% Inadequate	314	92.1	24	7.0	288.00*	<0.001*
≥60 Adequate	27	7.9	317	93.0		

McN McNemar test

p: p value for comparing between pre and post * Statistically significant at $p \leq 0.05$

Table (5): Comparison between studied sample on pre and post overall scores of hypertension Self Care Activities Scale (H-Scale) (n = 341)

Items	Pre		Post		Test of sig.	p
	No.	%	No.	%		
Overall						
<60% Inadequate	326	95.6	48	14.1	McN = 276.004*	<0.001*
≥60 Adequate	15	4.4	293	85.9		
Total score						
Min. – Max.	58.0 – 131.0		75.0 – 153.0		t= 47.058*	<0.001*
Mean ± SD.	86.56 ± 12.73		132.04 ± 14.80			
% score						
Min. – Max.	17.65 – 71.32		30.15 – 87.50			
Mean ± SD.	38.65 ± 9.36		72.09 ± 10.89			

McN : McNemar test

t: Paired t-test

p: p value for comparing between pre and post

*: Statistically significant at p < 0.001

Table (6): Comparison between pre and post overall scores of self-efficacy (n = 341)

Self-efficacy	Pre		Post		Test of sig.	p
	No.	%	No.	%		
Overall						
<60% Inadequate	332	97.4	7	2.1	McN = 323.003*	<0.001*
≥60 Adequate	9	2.6	334	97.9		
Total score						
Min. – Max.	6.0 - 22.0		20.0 - 30.0		t= 94.887*	<0.001*
Mean ± SD.	9.96 ± 3.15		26.77 ± 2.08			
% score						
Min. – Max.	0.0 - 66.7		58.3 - 100.0			
Mean ± SD.	16.52 ± 13.14		86.55 ± 8.68			

McN : McNemar test

t: Student t-test

p: p value for comparing between pre and post

*: Statistically significant at p ≤ 0.05

Table (7): Relation between Overall Self-efficacy and Patient's knowledge and Hypertension Self-Care Activities Scale (n = 341)

Items	Overall Self-efficacy				χ^2	FE p
	Inadequate (n = 7)		Adequate (n = 334)			
	No.	%	No.	%		
Knowledge						
<60 Inadequate	4	57.1	15	4.5	36.126*	<0.001*
≥60 Adequate	3	42.9	319	95.5		
Medication use						
<60 Inadequate	0	0.0	15	4.5	0.329	1.000
≥60 Adequate	7	100.0	319	95.5		
Low-salt Diet						
<60 Inadequate	4	57.1	142	42.5	0.599	0.467
≥60 Adequate	3	42.9	192	57.5		
Physical Activity						
<60 Inadequate	4	57.1	30	9.0	17.716*	0.002*
≥60 Adequate	3	42.9	304	91.0		
Smoking						
<60 Inadequate	0	0.0	150	44.9	5.613*	0.019*
≥60 Adequate	7	100.0	184	55.1		
Weight Management						
<60 Inadequate	0	0.0	27	8.1	0.615	1.000
≥60 Adequate	7	100.0	307	91.9		
Relaxation technique						
<60 Inadequate	3	42.9	27	8.1	10.333*	0.017*
≥60 Adequate	4	57.1	307	91.9		
Self-monitoring						
<60 Inadequate	3	42.9	6	1.8	44.985*	<0.001*
≥60 Adequate	4	57.1	328	98.2		
Follow up						
<60 Inadequate	3	42.9	21	6.3	*14.014	0.009*
≥60 Adequate	4	57.1	313	93.7		
Overall H care						
<60 Inadequate	0	0.0	48	14.4	1.171	0.599
≥60 Adequate	7	100.0	286	85.6		

 χ^2 : Chi square test

FE: Fisher Exact

*: Statistically significant at $p \leq 0.05$

DISCUSSION

Hypertension progressively and permanently damages target organs, lead to life-threatening complications and death. A lack of knowledge about hypertension negatively influences patients' awareness and behaviors and is a major obstacle in controlling the disease; as well the poor control of hypertension is attributed to poor patients' self-efficacy with the treatment regimen Khosravizade, Hassanzadeh, and Mostafavi, (2015).

Lifestyle behavior modifications is the first line of intervention for all patients with hypertension, in combination with pharmacological treatment which is also important for the disease management to control its progress and prevent short and long term complications Abd elhay and Elmezayen,(2015). The primary aim of this study was to evaluate the effect of evidence-based life style guidelines on self-efficacy among hypertension patients at Port Said City.

In the light of the findings of the current study, it was shown that more than half of participants were overweight. This results were supported by the study of" Long-term outcomes from healthy eating and exercise lifestyle program for overweight people with heart disease and diabetes" which was confirmed with Alharbi, Gallagher, Kirkness, Sibbritt, & Tofler, 2016 in Australia who added that being overweight comes with a lot of help related risks, including development of hypertension and diabetes mellitus. This result could be attributed to the fact that being overweight leads to little physical activity as well as accumulation of fats on the walls of arteries that made arteries more narrower leading to hypertension.

Concerning duration of hypertension disease, the current study revealed that more than two fifth of studied subject had diagnosed with hypertension since less than five years. These findings were consistent with Sabouhi, Babae, Naji, and Zadeh, (2011) who conducted a study in Iran about " Knowledge, awareness, attitudes and practice about hypertension in hypertensive patients referring to public health care centers in Khor and Biabanak" who mentioned that about three fifth had hypertension since less than ten years.

Furthermore, the present study result showed that about more than half of participants had positive family history of hypertension. This result was in agreement with the study carried out in Mongolia by Demaio, Otgontuya, de Courten, Bygbjerg, Enkhtuya, Oyunbileg, et al. ,(2013) about "Hypertension and hypertension-related disease in Mongolia; findings of a national knowledge, attitudes and practices study who said that the

most risk factors for hypertension known to the subjects were family history (56.1%), followed by excessive salt intake (21.8%) and the least was alcohol intake (7.4%). This indicated that hypertension is an inherited disease and is widespread in many Egyptian families.

The present study showed that most of participants had unsatisfactory level of knowledge about hypertension before implementation of evidence-based guidelines and it was improved after implementation of guidelines. This finding is supported by Jarelnape, 2016 in their study on "The effect of health educational program on patients' knowledge about hypertension and its' management In Sudan - White Nile State" who found that the most of the patients did not have an adequate level of knowledge about hypertension pretest, while as; Post-test after intervention ,the majority of patients had good knowledge to adjust their blood pressure lifestyle changes involving dietary and exercise being effective in significant decrease in weight, and effective in improving patient's knowledge. This might be attributed to the educational level of the subjects, where about one quarter of them were illiterate and more than one quarter had primary level of education.

Regarding practices how patients deal with their hypertension disease. It was observed that the most of them had an inadequate level of practice about blood pressure measurement, relaxation exercises and weight management that significantly improved after patients' involvement in the guidelines sessions. These findings were in the same line with Ez Elregal, (2014) in Ain Shams University who reported in their study about "Promoting Health behaviors of Clients with Hypertensive Kidney Disease by Using Health Promotion Model" that there was improvement of practice about blood pressure measurement, breathing exercises and Progressive Muscle Relaxation after program. It might be due to that the patient required enough instructions about practices that help in minimizing occurrence of stress.

Regarding medication use, the current study revealed that the majority of participants accepted the step of taking medication regularly in the same time with the same dose according to physician order to avoid possible complications, with a statistical difference between pre and post implementation of the guidelines. This finding approved by Abdul Rahman, Wang, Yiu Kwong, Morales, Sritara and Sukmawan, (2015) who mentioned in their study about "Perception of hypertension management by patients and doctors in Asia " that hypertensive patients agreed that successful hypertension management was not defined by reaching a target blood pressure, but rather, involved

taking their medication regularly, attending scheduled check-ups with their doctor, having their blood pressure measured, and experiencing a lack of symptoms.

Pertaining to the results of this study, the majority of participants had inadequate practice related to low salt diet in the self-care activity scale came in the lowest level of adherence in the pre and post implementation phase this may be due to difficulty in change of diet habits and the pleasure of eating fast food. This result was in accordance with Abd ElHay and ElMezayen (2015) who said in their study about " Knowledge and perceptions related to hypertension, lifestyle behavior modifications and challenges that facing hypertensive patients "that although participants hardly disagreed on the negative effects of salt, they perceived more beliefs regarding barriers to tasteless food when prepared with little salt, confirming the feeling of pleasure when consuming salty food.

As regard to physical activity, the current study revealed that there was statistical difference between pre and post application of guidelines where the majority of subjects follow regular physical activity after implementation. This finding was in line with the study confirmed with Subramanian, Soudarssanane, Jayalakshmy, Thiruselvakumar, Navasakthi & Ajit Sahai, et al., (2011) on " Non-pharmacological Interventions in Hypertension: A Community-based Cross-over Randomized Controlled Trial "who showed that physical exercise is the most effective choice of nursing guideline program interventions and emphasized that exercise is a cornerstone therapy for the prevention, treatment and control of hypertension. This result could be attributed to that subjects conceived the benefits of regular physical activity and its vital effects in body general health and weight management.

In relation to smoking, the current study results revealed that there was a statistical difference between and after implementation of guidelines. These results were supported by the study of "Measure Outcomes of Patients' Instructions about Modifiable Risk Factors for Hypertensive Patients on Their Attitude and Lipid Profile" done by Hamed, Sherif , Mahdy and Arafat ,(2019) who mentioned that there were marked changes of lifestyle behavior (Diet, exercise, medication, smoking, and psychological) from poor practice in pre-intervention to good practice in follow-up phase with highly statistically significant difference among study phases in all items. It could be attributed to the idea that subjects did not realize the dangerous effect of smoking and its negative impact in developing hypertension.

In relation to weight reduction, there was a highly statistically difference between pre and post application of guidelines. This result matched with Ahmed, Taha, Ali and Abd EL-Razi, (2017) in their study about "Effect of an educational program on knowledge and self-efficacy of patients with essential hypertension toward therapeutic regimen "who found there was difference between pre and post program regarding weight reduction. This result might be due to that the majority of participants had realized the dangerous effect of overweight on blood pressure. Obesity and overweight are important risk factors contributing to the development of hypertension.

The present study results showed that following relaxation technique scores had improved in the post program to high level of adherence. This result came in line with Kofi, (2011) in their study on " Prevention and Management of Hypertension: A study on knowledge and attitudes of women of childbearing age "who mentioned that most of the hypertensive patients believed that avoiding stress could prevent and control hypertension. This indicated that there was an increase in the subjects' awareness about the positive action of relaxation techniques after implementation of guidelines.

According to the results of the present study, there was highly statistical difference between pre and post-test results regarding self-monitoring where the majority of participants perceived the importance of self-monitoring This results came in the same line with Sanders, Loveday , Pearson , Edwardson, Yates , Biddle et al., (2016) on their study of "Devices for Self-Monitoring Sedentary Time or Physical Activity: A Scoping Review who believed that self-monitoring may contribute to maintaining healthy behaviors and improving health outcomes. This could be explained that the guidelines were effective in educating the subjects the right technique for measuring blood pressure.

Concerning follow up adherence, there was highly statistically difference between pre and post implementation of guidelines. This was in accordance with the study done by Al-Ali and Elzubair, (2016) about " Establishing rapport: Physicians' practice and attendees' satisfaction at a primary health care center, Dammam, Saudi Arabia" who believed that frequent visits to doctors can raise patients' understanding of effective hypertension care and improve communications between patients and doctors. Frequent visits to primary health care centers can also improve the rapport between patients and doctors. This could be explained that the majority of participants in the post program phase realized that follow up was an important step towards hypertension control.

The present study results revealed that evidence based lifestyle guideline implementation was enhanced self-care activities with highly statistically significant difference between pre and post implementation phase. These results are in consistent with the study on " Knowledge and lifestyle practices of hypertensive patients attending a primary health care clinic in Botswana " in Nigeria conducted by Zangu and Djumbe ,(2018) who revealed that participant's knowledge of recommended lifestyle practices for hypertensive individuals varied from average to high as almost all of them gave a correct response for practices related to smoking and stress. These results reflected the lack of awareness of the subjects towards hypertension self-care activities before implementation of guidelines.

Regarding self-efficacy, this present study showed that there was highly statistically difference between pre and post implementation of the guidelines. This finding was in accordance with Hu, Li and Arao (2013) in their study on " Validation of a Chinese Version of the Self-Efficacy for Managing Chronic Disease 6-Item Scale in Patients with Hypertension in Primary Care" who found self-efficacy had been recognized as a major predictor of self-care behavior for chronic disease management as adopting healthy diet and regular exercise, reported better health status, and lower psychological distress. This may be because most hypertensive patients already know what actions they should take, such as weight loss, smoking cessation or participating in exercise activities, but knowledge is insufficient to stimulate actions. Patients need to believe in their capability and have confidence to perform the expected behavior.

Finally, the present study results showed that implementation of the evidence based lifestyle guidelines enhanced self-efficacy of participants with high statistical significant difference between pre and post implementation phase of the guidelines. These results are in line with Ahmed, et al., (2017) on their study about "Effect of an Educational Program on Knowledge and Self-Efficacy of Patients with Essential Hypertension toward Therapeutic Regimen". who mentioned that, patients with higher self- efficacy levels are more likely to start or maintain a specific task even in face of existing barriers. Several self -management programs successfully targeted self-efficacy resulting in improved health outcomes.

CONCLUSION

Based on the results of the present study:

It was concluded that, most of the studied hypertensive patients had unsatisfactory knowledge toward their disease before implementation phase of evidence-based lifestyle guidelines, while the majority had satisfactory knowledge after implementation phase with highly statistically significant difference. Also, the present study results concluded that most of the studied sample had inadequate level of adherence to self-care activities before implementation of evidence-based lifestyle guidelines while after implementation the majority had adequate level of adherence to self-care activities with highly statistically significant difference. Furthermore, the current study revealed that the majority of hypertensive patients included in the present study had low level of self-efficacy before implementation of the guidelines while the results had changed after implementation to become, most of patient s had sufficient level of self-efficacy towards their chronic disease.

RECOMMENDATIONS

In the light of the present study results, the following recommendations are:

1. Apply evidence-based lifestyle guidelines more and more to cover all hypertensive patients to help them understanding the nature of their chronic disease and trying to cope without any complications.
2. Provide medical clinics in primary health care centers with simple guidelines booklets, posters and pamphlets containing all necessary information and practice about how to act with hypertension to hypertensive patients to help them to remember the information on need and facilitate adherence to self-care activities.
3. Encourage hypertensive patients to participate in health education and counseling programs about healthy lifestyle and explain its importance and their impacts in decreasing patients' blood pressure.
4. Increase public awareness about hypertension and the major role of evidence based lifestyle in preventing and reducing complications of this silent disease.
5. Highlight the positive role of self-efficacy as it plays an important role to take steps for making changes in lifestyle and learning new skills to cope with the disease process.

Further study:

Develop an educational program for studying the effect of evidence-based lifestyle guidelines on self-efficacy among hypertension patients.

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تأثير المبادئ الإرشادية لنمط الحياة القائم على الأدلة على الكفاءة الذاتية على مرضى ارتفاع ضغط الدم

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الخلاصة

ارتفاع ضغط الدم مرض مزمن يصيب الملايين ويسبب ملايين المضاعفات كل عام في جميع أنحاء العالم. يحتاج الأشخاص المصابون بارتفاع ضغط الدم إلى إجراء العديد من التعديلات على نمط الحياة ، ليس فقط لعلاج ارتفاع ضغط الدم ولكن أيضاً للوقاية من الأمراض المزمنة الأخرى ذات الصلة. **الهدف:** تقييم تأثير إرشادات أسلوب الحياة القائمة على الأدلة على الكفاءة الذاتية بين مرضى ارتفاع ضغط الدم. **الموضوع والطريقة:** تم استخدام تصميم شبه تجريبي لإجراء الدراسة. تم تحديد عينة هادفة من 341 مريضاً يعانون من ارتفاع ضغط الدم من ستة مراكز رعاية صحية أولية في مدينة بورسعيد. **أداة جمع البيانات:** جمع البيانات من خلال ؛ البيانات الديموغرافية ، والتاريخ الطبي للمريض ، وورقة تقييم المعرفة ، ومقياس أنشطة الرعاية الذاتية لارتفاع ضغط الدم ، ومقياس الكفاءة الذاتية. **النتائج:** تبين أن غالبية مجموعة الدراسة لديهم معرفة غير مرضية بينما بعد التنفيذ (94.4%) لديهم معرفة مرضية. ما يقرب من (5%) منهم كان لديهم مستوى كافٍ من نشاط الرعاية الذاتية بعد التنفيذ (86%) ، وحوالي (2.1%) فقط كان لديهم مستوى كافٍ من الكفاءة الذاتية قبل تطبيق المبادئ الإرشادية اما بعد التنفيذ اصبح (97.9%). **الخلاصة:** كان لدى معظم مرضى ارتفاع ضغط الدم الخاضعين للدراسة معرفة غير مرضية ، والالتزام بأنشطة الرعاية الذاتية والكفاءة الذاتية تجاه مرضهم قبل تنفيذ إرشادات نمط الحياة القائمة على الأدلة ، في حين اصبح الغالبية لديهم معرفة مرضية بالالتزام بأنشطة الرعاية الذاتية والفعالية الذاتية بعد التنفيذ من الدلائل الإرشادية مع فرق كبير إحصائياً. **توصية:** تطبيق إرشادات نمط الحياة القائمة على الأدلة أكثر فأكثر لتغطية جميع مرضى ارتفاع ضغط الدم لمساعدتهم على فهم طبيعة مرضهم المزمن ومحاولة التكيف دون مضاعفات.

الكلمات المرشدة: إرشادات نمط الحياة المبنية على الأدلة ، ارتفاع ضغط الدم ، نشاط الرعاية الذاتية والفعالية الذاتية