Original Research Article

Effect of Evidence Based Lifestyle Guidelines on Self Efficacy of Patients with Hypertension

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A B S T R A C T

K e y w o r d s Evidence based, lifestyle Guidelines, Self efficacy, Self-care activity and hypertension	Hypertension is one of the major cardiovascular diseases worldwide. Lifestyle modification is the first line of intervention for all patients with hypertension. 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. The aim of this study was to assess and evaluate the effect of evidence based lifestyle guidelines on self efficacy of patients with hypertension. Quazi experimental design was utilized for conducting the study. Purposive sample of 160 patients with hypertension recruited from cardiac out- patient clinic at Ain Shams University Hospital Cairo Egypt. The subjects were randomly divided into study and control group. Data collected through; demographic data and patient's medical history, knowledge assessment sheet, hypertension self care activities scale and self efficacy scale. It showed that two fifths had hypertension stage1 before implementation, while (70%) of the study group had normal blood pressure after implementation. Two groups had unsatisfactory knowledge while after implementation (87.5%) and (2.5%) of study and control groups had satisfactory knowledge. Nearly one third of them had an adequate level of self-care activity and adequate self efficacy while after implementation (100%) and (38.8%) had an adequate level of self-care activity and (92.5%) and (34%) had an adequate level of self efficacy. Results show that highly positive correlation between self-efficacy, knowledge, and self care activity among the study group with P≥0.000. Evidence based lifestyle guidelines enhance blood pressure, knowledge, self care activity and self efficacy of study group. The nurses should be trained to conduct evidence based educational program and lifestyle guidelines. This study may provide a practice framework for the future development of other nursing evidence based practice.

Introduction

Hypertension is one of the major cardiovascular diseases worldwide; in 2000; 26% of the adult population had hypertension. It has been estimated that

hypertension is responsible for 4% of the global burden of diseases in both developing and developed regions (Alhalaiqa *et al.,* 2012; Leon *et al.,* 2014). Poorly controlled

hypertension (HTN) is a significant public health concern all over the world, in term of morbidity, mortality, and economic burden (Ogedegbe *et al.,* 2013). It is the leading and most important modifiable risk factor for heart diseases, stroke, renal diseases and retinopathy (Bani, 2011).

National hypertension Project (NHP) in the 90s showed that hypertension is common among Egyptians. Hypertension is affecting more than 26% of adult Egyptians and more than 50% of individuals older than 60 years suffered from hypertension (Ibrahim and Albertino, 2012). 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 hypertension and about 7 million will be in need of lifelong drug treatment and regular follow-up. The problem is complicated by the low awareness rates, only 38% of hypertensive Egyptians aware of having high blood pressure (Ibrahim, 2013).

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 (Lambert *et al.,* 2006). Lifestyle modification is the first line of intervention for all patients with hypertension, but pharmacological is the cornerstone for the disease treatment to reduce the high blood pressure and prevent complications such as cardiovascular and renal morbidity and mortality (Lemone and Burke, 2008).

Lifestyle modifications that effectively lower blood pressure (BP) include weight loss, reduced sodium intake, smoking cessation, weight control, engagement in regular exercise, restrictions of alcohol, stress management and medication compliance (Bosworth et al. 2008; Dolor et al., 2009). In addition, a diet rich in fruit, vegetables, and low-fat dairy products reduced in total and saturated fat, has also proved to lower BP (Onwukwe and Omole, 2012).

EBP (Evidence Based practice) is now considered a standard of care and essential to nurse practitioner practice. The primary advantages of EBP include improved quality of care through patient-centered care, the utilization of patient resources, provider resources and experiences, current research and scientific information (Greiner and Knebel, 2003)

The NICE guidelines for the treatment of patients with hypertension recognize the importance of self-management aimed at lifestyle modifications as an adjunct therapy that effectively lowers blood pressure.

Self-efficacy is widely used as psychological concept that has been recognized as an essential prerequisite of effective care of chronic disease. Several studies have underlined the association between self-efficacy and chronic diseases as hypertension, diabetes, and arthritis. 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 and Arao*,* 2013).

Teaching self-care skills associated with control of BP is not enough to bring about behavior change the individual will need to integrate these skills into everyday life to improve their sense of self-efficacy or confidence in their ability to perform their self-care behaviors (Curtin et al., 2008).

The lifestyle approach is particularly an important behavioral strategy for self-management of hypertension (Bosworth et al. 2005, 2008, Xue et al. 2008). One of the interventions with lifestyle modifications was designed to improve self-management for hypertensive care through educational and behavioral modules that included medication adherence, restrictions in dietary sodium and alcohol intake, weight control, stress reduction and smoking cessation.

Hypertensive patients who received the tailored lifestyle intervention (n = 294) had a significant decrease in blood pressure from 40–54% over a 24-month study period (p = 0.03) (Bosworth et al., 2005).

Self-management education increased self-care knowledge about hypertension, compliance with healthcare appointments and self-care behaviors, decreased healthcare use and improved adherence to medication and exercise in nursing home residents or community-dwelling older adults with hypertension (Xue et al. 2008).

Healthcare providers can assist patients in control of their illness by helping them and their families: acquire knowledge and skills necessary to engage in self-care; develop self-efficacy and social support to assist in resolving identified barriers; and, increase motivation to perform self-care (Rujiwatthanakorn *et al.,* 2011).

Nurses should be aware of the symptoms and treatment of hypertension so that they can offer holistic, evidenced based care for hypertensive patients.

Through the emphasis of health promotion behaviors, such as lifestyle modification, nurses can assist patients in measures to prevent or control hypertension, as well as provide the necessary health education necessary to influence an individual's perception of health (Breen, 2008).

Significance of the study

Evidence-based nursing practice (EBN) has been the gold standard for nursing care delivery. It is 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 (Hong, 2010).

The health education topics that nurses should address to hypertension patients include instructions for checking blood pressure, preventing complications and adhering to pharmacological and non-pharmacological treatments, such as physical exercise, healthy diet, smoking cessation, moderating drinking habits and reducing stress.

Additionally, the centered self-care approach encourages behavior changes both during and after the education process (Guedes *et al.,* 2012).

The aim of this study was to assess and evaluate the effect of evidence based lifestyle guidelines on self efficacy of patients with hypertension.

Hypothesis

It was hypothesized that the patients with hypertension who will be exposed to evidence based lifestyle guidelines (study group) will have improved knowledge, self care activities and self efficacy compared to the patients in the control group who will not be exposed to evidence based lifestyle guidelines.

Subject and Methods

Research design

A quasi experimental study design was utilized to accomplish this study.

Setting

The study was conducted in cardiac out-patient clinic at Ain Shams University Hospital Cairo Egypt which provides secondary and tertiary level service to individuals with hypertension.

Subjects

A purposive sample of patients diagnosed with hypertension (BP $\geq$ 140/90). All patients were selected from those attending outpatient clinics for routine follow up. Power analysis was conducted estimating the sample size needed for the present study. To achieve 80 % power with a medium effect and an alpha of 0.05, a minimum of 150 participants was projected. We invite 169 patients who agreed to participate, 160 completed the questionnaires. So the study comprised 160 adult patients, of age between 18 to 80 years of either sex. Patients were recruited after full history taking, physical examination and complete investigations. The subjects were randomly divided into two equal groups; the first was study group, comprised of 80 patients and they received the NICE lifestyle guidelines regarding control blood pressure. The second was control group, comprised of 80 patients and exposed to routine outpatient care only.

Tools for data collection

Three different tools were used to collect data for this study. They developed by researcher in English language based on

resent literatures then translated into Arabic language. Validity and reliability were done. Back translation were done.

Tool 1:

Self Administered Structured Questionnaire

It was developed by the researchers in Arabic language, it contains two parts:

A) Demographic characteristics of patients such as age, sex, marital status, level of education, working status, residence, and monthly income …etc.
B) Patient's medical history including stage of hypertension, body mass index, duration of disease, associated chronic disease and smoking status…. etc.

Tool11:

Patient's knowledge assessment sheet

It was developed by the researchers in Arabic language based on recent literature and it was consists of 17 items about hypertension, such as: definition, causes, factors symptoms, complications, normal range and management activities as diet, exercise, self-monitoring, medication, relaxation, follow up and smoking cessation. Each item had sub items

Scoring systems

The total score of knowledge was 50 degrees. The score one was given for each correct answer and zero for incorrect answer. These scores were converted into a percent score. The total knowledge was considered satisfactory if the percent score was 60% or more and unsatisfactory if less than 60%. Reliability test were done whereas Cronbach's Alpha equal 0.702

Tool 111:

Hypertension Self Care Activities Scale

The scale was developed by the researchers based on literature review. The scale consists of 22 items to assess four aspects of activities for hypertension such as diet, exercise, medication, smoking cession, relaxation technique, self-monitoring and follow up. The questions used the 5-point Likert scale from strongly agree to strongly disagree Reliability test were done whereas Cronbach's Alpha equal 0.808

Scoring systems

The scoring of Self Care Activities was for patients with hypertension were 110 degrees. These scores were converted into a percent score. The total Self Care Activities for patients with hypertension was considered adequate if the percent score was 60% or more and inadequate if less than 60%.

Tool IV:

Self-Efficacy Scale

The scale was developed by the researchers based on literature review. The scale consists of 11 items to assess self-efficacy for patients with hypertension such as diet, medication, measurement and follow up. Reliability test were done whereas Cronbach's Alpha equal 0.65

Scoring systems

The scoring of Self efficacy was more than 3to7 days were considered adequate. While less than3were considered inadequate.

Pilot study

The pilot study was conducted on 10 patients to test the clarity, feasibility and applicability of the determent 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.

Procedures of the study

This study was conducted through four consecutive phases: assessment, planning, implementation and evaluation. Data collection was done pre- and post-guidelines implementation from April 2013 to December 2013.

This study was conducted through four consecutive phases: assessment, planning, implementation and evaluation. Data collection was done pre- and post-guidelines implementation from April 2013 to December 2013.

- Assessment phase: This phase aimed to assess the studied patients' characteristics, patients' knowledge, self care activities and self efficacy of the study and control groups.
- Planning phase: guidelines content were prepared based on NICE life style guidelines (2011) by the researchers. Guidelines were revised by a group of six expertises in medical surgical nursing and community health nursing departments faculty of nursing Ain Shams University for the content validity. Modifications were done.
- Implementation phase: Assessment sheets were filled out by the researchers who were available 2 days per week in the study setting from 8a.m to 2p.m. lectures, group discussion and demonstration. An instructional media was used; it included the guidelines handout and audiovisual materials.

- Evaluation phase: the evaluation phase was emphasized on estimating the effect of NICE life style guidelines (2011) on patients' knowledge, self care activities and self efficacy of the study group. The post test was conducted for study and control groups after 3months of implementation phase.
- Administrative design and ethical consideration:

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. The aim of the research was explained to the participants. Verbal consent was obtained from each patient to participate in the study, after clarifying the procedures of the study. Participants were informed about their right to refuse participation and to withdraw at any time without any consequences. Confidentiality of data was ensured.

Statistical design

The quantitative data was analyzed using Statistical Package for Social Sciences (SPSS) program version 17. Data were presented in the tables and charts using actual numbers and percentages. Appropriate statistical methods were applied (percentage, chi-square (X^2), correlation coefficient (r), T- test. Regarding P value, it was considered that: non-significant (NS) if $P> 0.05$, Significant (S) if $P< 0.05$, Highly Significant (HS) if $P< 0.01$.

Regarding demographic characteristics, table 1 shows that nearly two fifths (40% and 41.3%) respectively of the study and control groups aged 60 years and more, (49.75±13.21) and (51.97±13.61) were means and standard deviation of the study and control groups respectively.

It shows that nearly two thirds (67% and 63%) respectively were females, nearly one third (35% and 31.2%) respectively had secondary education, also nearly two thirds (65% and 61.2%) were work and married, (65%) and (71.2%) had family members from (3 to 6) members, nearly two thirds (63.7% and 61.2%) had monthly income less than one thousand and one thousand with mean of 1352.62±705.57 and 1350±705.08 in the study and control groups respectively with no statistically significant difference between two groups regarding demographic characteristics. Regarding clinical data of two groups, this table shows that 13.8% and 17.5% of them were smokers, 40% and 35% of them had type 2 diabetes, only 18.8% and 17.5% of them had health insurance, nearly two fifths (42.5% and 43.8%, respectively) of them had hypertension from more than ten years with mean of duration (7.93±3.16) and (7.90±3.32) for the study and control groups respectively. There was no statistical significant difference between two groups regarding clinical data.

Regarding Blood pressure measurement of two groups before implementation of NICE lifestyle guidelines, table 2 shows that nearly two fifths (45% and 48.8%) had hypertension stage 1 with no statistically significant difference, while after implementation 70% and 7.5% had normal Bp in the study and control groups respectively with highly statistically significant difference between them. In addition, regarding body mass index of two groups it shows that nearly one third 32.5% and 38.8% had obesity class 1. While after implementation 27.5% and 30 % had obesity class 1 in the study and control groups respectively with slightly decrease in all level of BMI for study group with no statistical significant difference between them.

Regarding Mean of systolic, diastolic and body mass index of two groups before implementation of NICE lifestyle guidelines figure 1 shows that 158.3 mmHg and 158.6 mmHg were means of systolic blood pressure while after implementation of 141.3 mmHg and 157.4 mmHg were means of systolic blood pressure of study and control group respectively. Furthermore, before implementation 95.6 mmHg and 96 mmHg were means of diastolic blood pressure while after implementation, 83.7 mmHg and 95.6 mmHg were means of diastolic blood pressure of study and control group respectively. Additionally this figure shows that 30.9 and 29.6 were means of body mass index before implementation while after implementation 30.7 and 29.6 were body mass index of study and control group respectively.

Regarding hypertension' knowledge of study and control groups before implementation of NICE lifestyle guidelines, table 3 shows that no one of two groups had satisfactory total knowledge with no statistical significant difference, while after implementation of 87.5% and 2.5 of study and control groups respectively had satisfactory total knowledge with high statistical significant difference between them. Moreover, this table shows that before implementation the lowest level of knowledge in the two groups was regarding the effect of smoking 17.5% while the highest level of satisfactory knowledge among them was regarding the normal range (33.8%).

Regarding mean of satisfactory knowledge of two groups before and after implementation of NICE lifestyle guidelines, figure 2 shows that 8.25 and 31.2 were means of satisfactory knowledge in the study group before and after implementation, respectively. While 8.4 and 10.3 were means of satisfactory knowledge

in the control group before and after implementation respectively.

Regarding self-care activity assessment of study and control groups before implementation of NICE lifestyle guidelines, table 4 shows that nearly one third (31.2% and 32.5%) had an adequate level of total self-care activity with no statistical significant difference between them. While after implementation, 100% and 38.8% had an adequate level of total self-care activity with mean score 86.66±7.88 and 63.88±9.42 in study and control groups respectively with highly statistically significant difference between them. Additionally, this table shows that before implementation, the lowest level of self-care activity was regarding self-care activity of exercises 1.2% and 3.8% while the highest level of self-care activities was regarding self-care activity of medication 37.5% and 35% in study and control groups respectively with no statistical significant difference between them.

Regarding self efficacy assessment of study and control groups before implementation of NICE lifestyle guidelines, table 5 shows that 31.2% and 32.5% had an adequate level of total self efficacy with no statistical significant difference between them. While after implementation, (92.5%) and (34%) had an adequate level of total self efficacy with high statistical significant difference between them in study and control groups respectively. Moreover, this table shows that the lowest level of self efficacy was regarding measuring Bp self efficacy (0%) and (3.8%) while the highest level was regarding medication self efficacy (32.5%) and (22.5%) in study and control groups respectively with no statistical significant difference between them. Regarding correlation between self-efficacy of the study and control group regarding study

variables after implementation of NICE lifestyle guidelines, table 6 shows that highly positive correlation between self-efficacy, health insurance, working status, education, marital status, sex, total knowledge, and SCA of diet, exercise, smoking, medication, follow up, and total SCA among the study group with P=0.000. In addition this table shows that highly positive correlation between self-efficacy, and self care of exercise and diet among the control group.

Result and Discussion

The primary goal of treatment of the hypertensive patient is to prevent death and complications by achieving and maintaining the blood pressure at 140\90 mm hg or lower (Lambert *et al.,* 2006). Lifestyle modification is the first line of intervention for all patients with hypertension, but pharmacological is the cornerstone for the disease treatment to reduce the high blood pressure and prevent complications such as cardiovascular and renal morbidity and mortality (Lemone and Burke, 2008).

The risk of having hypertension increases with age (Winter *et al.,* 2013). This is supported with the findings of the present study were nearly two-fifths of the study and control groups aged 60 years and more. This is may be due to the age-related changes in arterial stiffness and decreased elasticity. The same findings were confirmed in other studies carried out in Egypt by Al-Wehedy *et al.* (2014) and Dawood (2012). Additionally, Wright et al. (2011) in USA, who investigated the prevalence of hypertension by age group and gender, found that a high prevalence of hypertension among older adults.

The present study showed that more than one third of study and control groups had type 2 diabetes. In accordance to Mandal,

2009 co-morbidities such as, diabetes mellitus and heart disease were found along with hypertension in the majority of patients. Mandal added that previous studies have found a higher prevalence of hypertension in diabetic patients than in non-diabetic patients. Its prevalence was 1.5 to 2 times higher in diabetics than in non-diabetics.

The findings of this study found that there were more overweight and obese participants than underweight and normal participants, after implementation (27.5%) and (30 %) had obesity class 1 in the study and control groups respectively with slightly decrease in all level of BMI for study group with no statistical significant difference between them. This may be due to the change in body weight would be expected on a long-term basis, and not within the two to three-month follow-up period of the present study.

Obesity and overweight are important risk factors contributing to the development of hypertension. A high number of hypertensive patients were found to be overweight or obese. Reduction of weight is a very effective measure in controlling blood pressure (Mandal, 2009). Also Flegal *et al.* (2010) confirmed that obesity and high fat diets are both widely known as risk factors for hypertension.

The main finding of present study was the success of implementation of NICE lifestyle guidelines in control BP. This finding was in accordance with Elmer et al. 2006 who founded that after implementation of lifestyle modification over 18 months, persons with pre-hypertension and stage one hypertension which sustained multiple lifestyle modifications improved control of blood pressure and could reduce the risk for chronic disease.

In addition, Dusek *et al.* (2008) founded that participants in the relaxation response group reduced their Systolic BP by an average of 10.2 mm Hg and those in the lifestyle modification group had similar results with a decrease of 9.4mm Hg. The diastolic BP for both groups reduced modestly by 1.6 and 2.6 for the RR group and the control group, respectively. Both groups lost a minimal amount of weight: 0.65 kg for the RR group and 0.33 kg for the control group. Also Rigsby (2011) stated that the implementation of healthy lifestyle modifications resulted in an improvement of blood pressure control.

In the same line Hong (2010) conducted a study on lifestyle modifications, which addressed weight control, limitation of alcohol consumption, increased physical activity, increased fruit and vegetable consumption, reduced total fat and saturated fat intake, and cessation of smoking. The research has provided strong evidence that a variety of lifestyle modification interventions affect lower BP and to reduce the incidence of HBP.

The present study showed that implementation of NICE lifestyle guidelines were improved knowledge of study group comparing control group with highly statistical significant difference. This result was in congruence with Al-Wehedy *et al.* (2014) who illustrated that lifestyle modification sessions improved the knowledge scores of the study group of hypertensive patients with highly statistical significant difference between study and control.

One recent study about Knowledge, perceptions and practices of lifestyle-modification measures among adult hypertensive in Nigeria, by Ikea *et al.* (2010) showed that there is no statistical difference regarding gender or educational level while a good proportion of the patients self-reported that they had adopted the lifestyle measures when they became aware of the implications on their hypertensive condition.

In accordance to Kanchana and Nagarathnamma (2009) who emphasized that, a structured teaching program on lifestyle modification conducted for 50 patients attending cardiology outpatient department, 84% of hypertensive patients had inadequate knowledge, and 16% had moderate knowledge with the mean score of 13.02 in the pre-test, and 42% had moderate knowledge with the mean score of 25.32 in the post test with statistically significant difference.

Ambaw *et al.* (2012) concluded that 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.

The study revealed that NICE lifestyle guidelines implementation were enhanced self-care activities of study group comparing to control group with highly statistically significant difference.

These results were in consistent with Rujiwatthanakorn *et al.* (2011) who found that before implementation of the self-management program, no significant differences were found, between the experimental and control groups regarding knowledge of self-care and self-care ability. However, significant differences were found, between the experimental and control group, four weeks after implementation of the self-management program, regarding

knowledge of self-care and self-care ability. The experimental group was found to have higher scores, than the control group.

Winter *et al.* (2013) added that the DASH (the Dietary Approaches to Stopping Hypertension eating plan) along with limited sodium intake of 1600 mg per day can decrease BP as well as single drug therapy. In addition, HBPM (home BP monitoring) has also been shown to improve patients' compliance with treatment and hypertension control and is used as an educational tool to increase patients' awareness and understanding of BP control. Studies have shown that self-BP monitoring at home may improve awareness and understanding of concordance, leading to better compliance and BP management.

This results showed that implementation of NICE lifestyle guidelines enhance self efficacy of study group whereas, after implementation, (92.5%) and (34%) had an adequate level of total self efficacy with high statistical significant difference between them in study and control groups respectively

This results were in consistent with a recent study measured the effect of written health educational materials on self-efficacy in CVD at risk people, found that providing Personal Health Record Booklet were promoted patients' efficacy in performing desired behaviors, which might have led participants to feel more confident in steps to perform activities (Pichayapinyo *et al.,* 2012).

Moreover, Park *et al.* (2012) found that the patient-tailored self-management intervention for nursing home residents with hypertension that integrated health education and individual counseling was beneficial for decreasing blood pressure at a clinically

significant level and improving self-care behaviors, exercise self-efficacy and medication adherence.

Also the findings showed that highly positive correlation between self-efficacy, health insurance, working status, education, marital status, sex, total knowledge, and SCA of diet, exercise, smoking, medication, follow up, and total SCA among the study group with P≥0.000.

In accordance to Warren-Findlow *et al.,* 2011, the majority of African American participants with hypertension had good self-efficacy to manage their chronic illness. Individuals with good self-efficacy had statistically significantly increased odds of being adherent to medication regimens, using low-salt diet techniques, engaging in physical activity, not smoking, and utilizing common weight management strategies (Warren-Findlow *et al.,* 2011).

In the same line, Hu and Arao (2013) stated that self-efficacy has been recognized as a major predictor of self-care behavior for chronic disease management. In a longitudinal study of older women with heart disease, self-efficacy predicted the older women's adopting healthy diet and regular exercise, reported better health status, and lower psychological distress. Shropshire (2010) added that medication adherence self-efficacy was positively related to education and medication adherence. Osborn *et al.* (2011) found that positive correlation between knowledge to self-efficacy (r=0.13, P<0.01) and self-efficacy to physical activity (r=0.17, P<0.01).

The main finding of present study was the success of implementation of NICE lifestyle guidelines in control BP, improved knowledge of study group comparing

control group with highly statistical significant difference. In addition guidelines were enhanced self-care activities and self efficacy of study group comparing to control group with highly statistically significant difference.

Also the findings showed that highly positive correlation between self-efficacy, health insurance, working status, education, marital status, sex, total knowledge, and SCA of diet, exercise, smoking, medication, follow up, and total SCA among the study group with P≥0.000.

Recommendation

The nurses should be trained to conduct evidence based educational program and lifestyle guidelines. This study may provide a practice framework for the future development of other nursing evidence based practice. Also the study suggests that NICE Guidelines can serve as practical work tools for nurses working in out-patient services. Further research is needed to clarify the impact of guidelines on clinical practices and patient outcomes.

Figure.1 Mean of systolic, diastolic and body mass index of two groups before and after implementation of NICE lifestyle guidelines
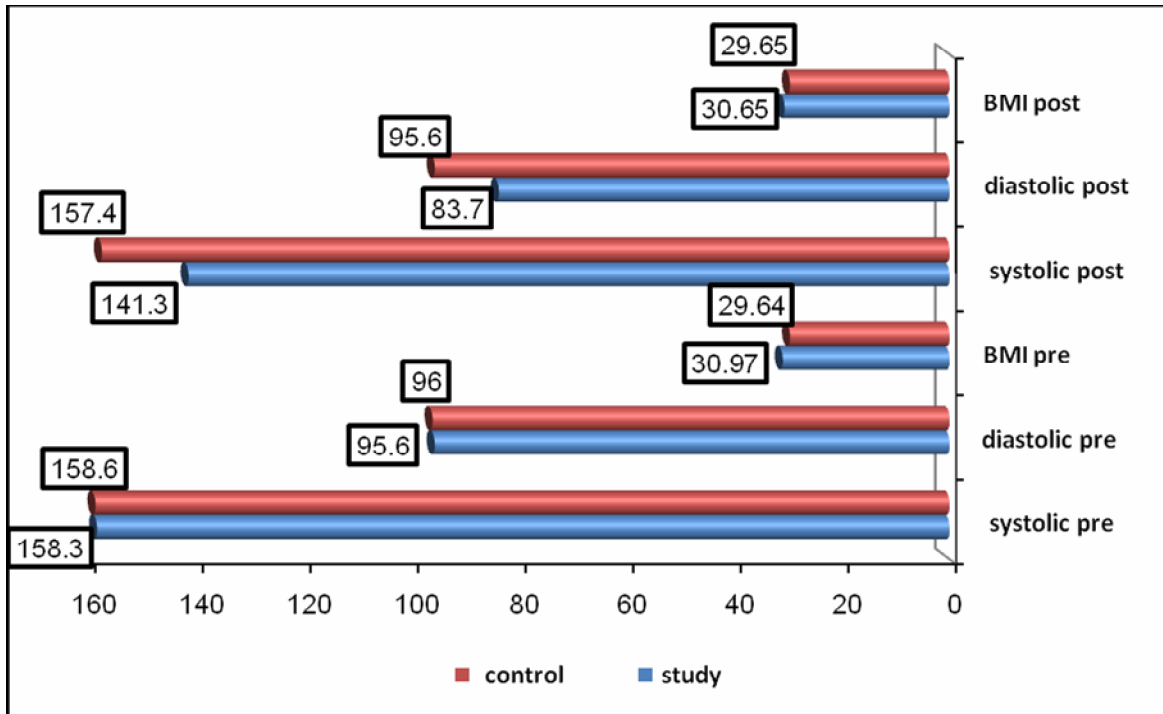
Table.1 Basic information of study and control groups

Parameters	study group Total=80		control group Total=80		Test X^2	P value
	No	%	No	%		
Age ⁄ years						
20-	22	27.5	22	27.5		
40-	26	32.5	25	31.2		
60-	32	40	33	41. 3	0.035	0.983
Mean and standard deviation of age	49.75±13.21		51.97±13.61			
Gender						
Male	26	32.5	29	36.2	0.249	0.370
female	54	67.5	51	63.8		
Education						
Illiterate	25	31.2	22	27.5		
Read and write	16	20	19	23.8	0.978	0.806
Secondary	28	35	25	31.2		
Higher	11	13.8	14	17.5		
Work status						
Work	52	65	49	61.2	0.242	0.372
Not Work	28	35	31	38.8		
Marital status						
Single	8	10	11	13.8		
Married	52	65	49	61.2	0.536	0.755
Widow and divorced	20	25	20	25		
Number of family member						
1-3	22	27.5	19	23.8		
3-6	52	65	57	71.2	0.849	0.654
□6	6	7.5	4	5		
Income						
≤1000	51	63.7	49	61.2		
1500-	19	23.8	20	25	0.297	0.990
≥2000	10	12.5	11	13.8		
Mean and SD of income	1352.62±705.57		1350±705.08			
Smoking						
Yes	11	13.8	14	17.5	0.427	0.332
No	69	86.2	66	82.5		
Co morbidities						
Diabetes	32	40	28	35		
Heart diseases	10	12.5	14	17.5	2. 481	0.779
Kidney diseases	1	1.2	3	3.8		
Liver diseases	9	11.2	11	13.8		
Health insurance						
Yes	15	18.8	14	17.5	1.732	0.130
No	65	81.2	66	82.5		
Duration of disease						
< 5	15	18.8	14	17.5		
5-	31	38.8	31	38.8		
>10	34	42.5	35	43.8	0.049	0.976
Mean and SD of income	1352.62±705.57		1350±705.08			

Table.2 Blood pressure measurement and body mass index of two groups before and after implementation of NICE lifestyle guidelines

Parameters	Pre implementation				Post implementation			
	study group Total=80	control group Total=80	Test X^2	P value	study group Total=80	control group Total=80	Test X^2	P value
	%	%			%	%		
Blood pressure								
Normal	11.2	7.2	0.792	0.851	70	7.5		
Stage I	45	48.8			27.5	48.8	41.70	0.000
Stage II	31.2	32.5			2.5	36.2		
Stage III	12.5	11.2			0	7.5		
BMI								
Normal	17.5	16.5	8.202	0.084	16.2	16.2		
Overweight	30	30.4			36.2	40	1.32	0.858
Obese Class I	32.5	38.8			27.5	30		
Obese Class II	11.2	13.9			17.5	11.2		
Obese Class III	8.8	1.25			2.5	2.5		

Figure.2 Mean of knowledge of two groups before and after implementation of NICE lifestyle guidelines
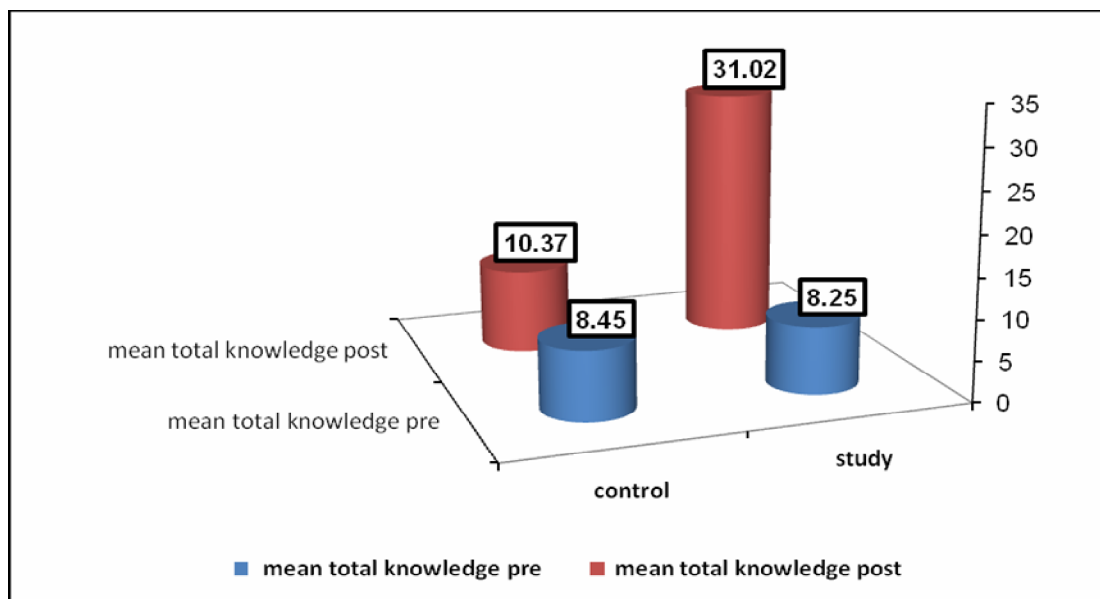
Table.3 Knowledge assessment of two groups before and after implementation of NICE lifestyle guidelines regarding hypertension

Parameters	Pre implementation				Post implementation			
	study group N=80	control group N=80	Test X^2	P value	study group N=80	control group N=80	Test X^2	P value
	%	%			%	%		
Def.	21.2	28.8	1.20	0.181	96.2	36.2	64.4	0.000
Causes	31.2	23.8	1.129	0.188	93.8	30	68.91	0.000
Symptoms	25	30	0.502	0.298	85	40	34.56	0.000
Complications	23.8	23.8	No test available		91.2	32.5	58.52	0.000
Lifestyle measures	23.8	25	0.034	0.50	83.8	31.2	45.11	0.000
Foods lower BP	28.8	25	0.286	0.361	96.2	30	75.42	0.000
Foods increase BP	25	28.8	0.286	0.361	92.5	36.2	55.18	0.000
Foods increase weight	22.5	27.5	0.533	0.292	96.2	35	66.52	0.000
Effect of exercise	22.5	22.5	No test available		83.8	27.5	51.27	0.000
Self monitoring	23.8	22.5	0.035	0.5	87.5	28.8	56.72	0.000
The normal range	33.8	33.8	No test available		100	40	68.57	0.000
BP can be measured by	23.8	21.2	0.143	0.425	93.8	21.2	86.03	0.000
Effect of relaxation	22.5	20	0.149	0.423	82.5	20	62.53	0.000
Effect of smoking	17.5	17.5	No test available		93.8	25	78.38	0.000
Importance of drugs	22.5	27.5	0.533	0.292	93.8	32.5	64.46	0.000
Importance of follow up	22.5	21.2	0.037	0.5	92.5	25	75.2	0.000
Factors	22.5	23.8	0.035	0.5	88.8	27.5	61.65	0.000
Total satisfactory knowledge	0	0	No test available		87.5	2.5	116.76	0.000

Table.4 Self care activity (SCA) of two groups before implementation of NICE lifestyle
guidelines regarding hypertension

Parameters	Pre implementation				Post implementation			
	study group N=80	control group N=80	T-Test	P value	study group N=80	control group N=80	T-Test	P value
	%	%			%	%		
SCA of diet Adequate	31.2	32.5	0.987	0.325	96.2	42.5	11.90	0.000
Mean score of diet self-care	21.22 ± 3.24	20.71± 3.31			26.53± 2.34	21.13± 3.30		
SCA of Exercise Adequate	1.2	3.8	-0.739-	0. 461	61.2	7.5	9.94	0. 000
Mean score of Exercise	2.18± 0.42	2.25± 0. 62			3.51± 0.77	2.36± 0. 67		
SCA of smoking cession Adequate	25	32.5	0.247	0.805	97.5	83.8	12.90	0.000
Mean score of smoking cession	3.80± 0.62	3.77± 0.65			4.83± 0.43	3.77± 0.59		
SCA of relaxation technique Adequate	3.8	3.8	0.702	0.483	68.8	3.8	14.68	0.000
Mean score of relaxation technique	2.23 ± 0.60	2.17 ± 0.52			3.61 ± 0.70	2.17 ± 0.52		
SCA of self-monitoring Adequate	13.8	12.5	-0.478	0.634	98.8	40	12.24	0.000
Mean score of self-monitoring	17.32 ±3.01	18.58± 3.88			23.87± 1.89	17.88± 3.49		
SCA of medications Adequate	37.5	35	1.775	0.078	100	36.2	13.87	0.000
Mean score of medications	12.62 ±1.58	12.17± 0.18			17.45± 2.60	12.42± 1.92		
SCA of follow up Adequate	25	25	1.69	0.093	100	26.2	13.38	0.000
Mean score of follow up	5.91± 2.00	5.40± 1.82			8.97± 1.00	5.55± 2.05		
Total SCA adequate	31.2	32.5	1.113	0.267	100	38.8	16.57	0.000
Total Mean score of SCA	64.12 ±8.74	62.57± 8.87			86.66± 7.88	63.88± 9.42		

Table.5 Self Efficacy of two groups before implementation of NICE lifestyle guidelines regarding hypertension

Parameters	Pre implementation				Post implementation			
	Study group N=80	Control group N=80	T-Test	P value	Study group N=80	Control group N=80	T-Test	P value
	%	%			%	%		
1-Diet Adequate	8.8	13.8	-0.339-	0.735	78.8	20	8.55	0.000
Mean score of diet	2.53± 0.87	2.58± 0.98			3.78± 0.41	2.80± 0.94		
2-Exercise Adequate	8.8	7.5	0.337	0.736	46.2	7.5	3.36	0.001
Mean score of Exercise	1.40± 1.41	1.32± 1.39			2.32± 1.86	1.45± 1.39		
3-measure BP Adequate	0	3.8	1.952	0.053	77.5	22.5	6.75	0.000
Mean score of BP measure	2.98± 0.87	2.71± 0.90			3.70± 0.94	2.71± 0.90		
4- Medication Adequate	32.5	22.5	-0.453-	0.65	100	11.2	16.66	0.000
Mean score of medication	4.58± 1.01	4.66± 1.07			7.00± 0	4.8± 1.14		
Total adequate Self Efficacy	31.2	32.5	X^2 0.029	0.5	92.5	42.5	X^2 45.58	0.000

Table.6 Correlation between self efficacy of the study and control group regarding study variables

Items	Self Efficacy of study group (n=80)		Self Efficacy of control group (n=80)	
	R	p- value	R	p- value
Income	0.288	0.009*	0.106	0.348
History	-0.323	0.003*	-0.147-	0.194
Duration of disease	-0.343	0.002*	0.099	0.385
Working status	-0.586	0.000**	-0.071-	0.529
Age	-0.036-	0.750	0.218	0.052
Education	0.826	0.000**	0.120	0.290
Marital status	-0.391	0.000**	-0.053-	0.640
Sex	-0.374	0.001**	-0.099-	0.381
Total Knowledge	0.699	0.000**	0.681	0.000**
SCA of Diet	0.699	0.000**	0.233	0.038*
SCA of Exercise	0.699	0.000**	0.595	0.000**
SCA of smoking	0.515	0.000**	0.310	0.005*
SCA of relaxation	-0.163-	0.147	0.059	0.605
SCA of self monitoring	0.106	0.348	0.267	0.017*
SCA of medication	0.478	0.000**	0.054	0.635
SCA of follow up	0.826	0.000**	0.048	0.674
Total SCA	0.853	0.000**	0.135	0.234

References

Alhalaiqa, F., Deane, K.H., Nawafleh, A.H., Clark, A., Gray, R. 2012. Adherence therapy for medication non-compliant patients with hypertension. A randomised controlled trial. J Hum Hypertens, 26: 117–30.

Al-Wehedy, A., Abd Elhameed, S.H., Abd El-Hameed, D. 2014. Effect of lifestyle intervention program on controlling hypertension among older adults. *J. Educ. Pract.,* Vol.5, No.5, 2014.61-71

Ambaw, A.D., Alemie, G.A., Yohannes, S.M., Mengesha, Z.B. 2012. Adherence to antihypertensive treatment and associated factors among patients on follow up at University of Gondar Hospital, Northwest Ethiopia. *BMC Public Health,* 12: 282. doi:10.1186/1471-2458-12-282.

Bani, I.A. 2011. Prevalence and related risk factors of Essential Hypertension in Jazan region, Saudi Arabia. *Sudanese J. Public Health,* 6(2): 45–50.

Bosworth, H.B., Olsen, M.K., Gentry, P., Orr, M., Dudley, T., McCant, F., Oddone, E.Z. 2005. Nurse administered telephone intervention for blood pressure control: a patient-tailored multifactorial intervention. *Patient Edu. Couns.,* 57: 5–14.

Bosworth, H.B., Olsen, M.K., Neary, A., Orr, M., Grubber, J., Svetkey, L., Adams, M., Oddone, E.Z. 2008. Take Control of Your Blood Pressure (TCYB study: a multifactorial tailored behavioral and educational intervention for achieving blood pressure control. *Patient Edu. Couns.,* 70: 338–347.

Breen, J. 2008. An introduction to causes, detection and management of hypertension. *Nurs. Stand.,* 23(14): 42–46.

Curtin, R., Walters, B., Schatell, D., Pennell, P., Wise, M., Klicko, K. 2008. Self-efficacy and self-management behaviors in patients with chronic kidney disease. *Adv. Chronic Kidney Dis.,* 15(2): 191–205.

Dawood, S. 2012. The relationship between hypertensive older adults' knowledge and attitudes regarding hypertension and their health related quality of life. Published Master Thesis. Faculty of Nursing, University of Alexandria.

Dolor, R.J., Yancy, W.S., Owen, W.F., Matchar, D.B., Samsa, G.P., Pollak, K.I., Lin, P., Ard, J.D., Prempeh, M., McGuire, H.L., Batch, B.C., Fan, W., Svetkey, L.P. 2009. Hypertension improvement project (HIP): study protocol and implementation challenges. *Trials,* 10: 13.

Dusek, J.A., Hibberd, P.L., Buczynski, B., Chang, B.H., Dusek, K.C., Johnston, J.M., Wohlhueter, A.L., Benson, H., Zusman, R.M. 2008. Stress management versus lifestyle modification on systolic hypertension and medication elimination: a randomized trial. *J. Altern. Complement. Med.,* 4(2): 129–138.

Elmer, P.J., Obarzanek, E., Vollmer, W.M., Simons-Morton, D., Stevens, V.J., Young, D.R., Lin, P.H., Champagne, C., Harsha, D.W., Svetkey, L.P., Ard, J., Brantley, P.J., Proschan, M.A., Erlinger, T.P., Appel, L.J. 2006. Effects of comprehensive lifestyle modification on diet, weight, physical fitness, and blood pressure control: 18-month results of

a randomized trial. *Ann. Intern. Med.,* 144: 485–495.

Flegal, K.M., Carroll, M.D., Ogden, C.L., Curtin, L.R. 2010. Prevalence and trends in obesity among US adults, 1999–2008. *J. Am. Med. Assoc.,* 303: 235–241.

Greiner, A.C., Knebel, E. (Eds.), 2003. Institutes of Medicine. Health professions education: A bridge to quality. National Academy Press, Washington, D.C.

Guedes N.G., Moreira R.P., Cavalcante T.F., Araujo T.L., Lopes M.V.O., Ximenes L.B., andVieira N.F.C. 2012. Nursing interventions related to health promotion in hypertensive patients Acta Paul Enferm.25(1:151–156.

Hong, W.S. 2010. Evidence-based nursing practice for health promotion in adults with hypertension: a literature review. *Asian Nurs. Res.,* 4(4): 227–245.

Hu, H., Li, G., Arao, T. 2013. Validation of a Chinese version of the self-efficacy for managing chronic disease 6-item scale in patients with hypertension in primary care. Hindawi Publishing Corporation ISRN Public Health. Vol. 2013, Article ID 298986, 6 Pp. http://dx.doi.org/10.1155/2013/298986.

Ibrahim, M.M. 2013: Problem of hypertension in Egypt, *The Egyptian Heart J.,* 65: 233–234.

Ibrahim, M.M., Albertino, D. 2012. Hypertension in developing countries. *Lancet,* 380: 611–9.

Ikea, S.O., Aniebueb, P.N., Aniebuec, U.U. 2010. Knowledge, perceptions and practices of lifestyle-modification measures among adult hypertensives in Nigeria. *Transact. Royal Soc. Trop. Med. Hyg.,* 104: 55–60.

Kanchana, G., Nagarathnamma, M. 2009. Effect of structured teaching programme on patient attending cardiology outpatient department. *Nurs. India,* 10(10): 4–6.

Lambert, E.V., Steyn, K., Stender, S., Everage, N., Fourie, J.M., Hill, M. 2006. Cross-cultural validation of the Hill-Bone compliance to high blood pressure therapy scale in a South African, Primary healthcare setting. *Ethnicity Dis.,* 16: 286–91.

Lemone, P., Burke, K. 2008. Medical-surgical nursing: critical thinking in client care (4th edn). Pearson Prentice Hall Company, New Jersey. Pp. 1158–60.

Leon, K., El hadidy, A., Tawfik, M., Gamal, A., Zidan, A. 2014. Observational study on patients' compliance with Irbesartan in essential hypertension ''I Comply''. *Egypt. Heart J.,* 66: 35–42.

Mandal, G.K. 2009. Physical activity, dietary habits and blood pressure among hypertensive patients in Phutthamonthon District, Nakornpathom Province, Thailand, Master thesis. Faculty of Graduate Studies Mahidol University. 77 Pp.

Ogedegbe, G., Fernandez, S., Fournier, L., Silver, S.A., Kong, J., Gallagher, S., de la Calle, F., Plumhoff, J., Sethi, S., Choudhury, E., Teresi, J.A. 2013. The Counseling Older Adults to Control Hypertension (COACH trial: Design and methodology of a group-based lifestyle intervention for hypertensive minority older adults. *Contemp. Clin. Trials.,* 35: 70–79.

Onwukwe, S.C., Omole, O.B. 2012. Drug therapy, lifestyle modification and blood pressure control in a primary care facility, south of Johannesburg, South Africa: an audit of

hypertension management. *S. Afr. Fam. Pract.,* 54(2): 156–61.

Osborn, C.Y., Paasche-Orlow, M.K., Bailey, S.C., Wolf, M.S. 2011. The mechanisms linking health literacy to behavior and health status. *Am. J. Health Behav.,* 35(1): 118–128.

Park, Y.H., Chang, H., Kim, J., Kwak, J.S. 2012. Patient-tailored self management intervention for older adults with hypertension in a nursing home. *J. Clin Nurs.,* 22: 710–722. doi:10.1111/j.1365-2702.2012.0423 6.x.

Pichayapinyo, P., Kaewpan, W., Taechaboonsermsak, P. 2012. Effect of personal health record booklet (PHRB to Knowledge, self-efficacy and healthy behaviors among Thai population at risk of cardiovascular disease (CVD). *J. Med. Assoc. Thai.,* 95(Suppl. 6): S48–S55.

Rigsby, B.D. 2011. Hypertension Improvement through healthy lifestyle modifications. *ABNF J.,* Spring 2011: 22. 2: ProQuest Central. pg. 41–43

Rujiwatthanakorn, D., Panpakdee, O., Malathum, P., Tanomsup, S. 2011. Effectiveness of a self-management program for thais with essential hypertension. *Pac. Rim Int. J. Nurs. Res.,* 15(2): 97–110.

Shropshire, T.B. 2010. Self-blood pressure monitoring, stage of change, medication adherence, self-efficacy and blood pressure control in hypertensive workers. Published doctorate thesis. The University of Alabama at Birmingham. Pp. 82–83

Warren-Findlow, J., Seymour, R.B., Huber, L.B. 2012. The association between self-efficacy and hypertension self care activities among African American adults. *J. Commun.*

Health, 37(1): 15–24. doi:10.1007/s10900-011-9410-6.

Winter, K.H., Tuttle, L.A., Viera, A.J. 2013. Hypertension. *Prim. Care Clin. Office Pract.,* 40(2013): 179–194. http://dx.doi.org/10.1016/j.pop.2012. 11.008.

Wright, J.D., Hughes, J.B., Ostchega, Y., Yoon, S.S., Nwankwo, T. 2011. Mean systolic and diastolic blood pressure in adults aged 18 and over in the United States, 2001–2008. *Natl. Health Stat. Reports,* 35: 1–23.

Xue, F., Yao, W., Lewin, R.J. 2008. A randomised trial of a 5 week, manual based, self-management programme for hypertension delivered in a cardiac patient club in Shanghai. *BMC Cardiovasc. Disord.,* 8: 10.