

## The Effect of Counseling on Patients' Adherence Regarding Anti Hypertensive Therapeutic Regimen

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**Abstract: Background:** Patients' education, their knowledge of cardiovascular risk factors, their perception of the benefits and potential risks of treatment, and their active participation in treatment decisions have been found to affect their adherence with treatment recommendations. Nurses play an important role in helping patients modify unhealthy lifestyles and behaviors, but they do not always routinely advise their hypertensive patients to change their behavior. Aim of the study: The aim of this study is to evaluate the effect of counseling on patients' adherence regarding anti hypertensive therapeutic regimen. Design of this study was a quasi- experimental research design. Setting: This study was conducted at Cardiac Outpatient Clinic in Ain Shams University Hospital. Subjects: A purposive sample of 60 patients was included in the study with essential and secondary hypertension. Tools: Patient interview questionnaire sheet, Patient's adherence assessment sheets as Morisky Medication Adherence Scale (MMAS), Hypertension Self-Care Activity Level Effects (H-SCALE) and The Beliefs about Medicines Questionnaire (BMQ). Results: All of the studied patients had inadequate knowledge about hypertension and self care activities regarding it pre counseling program intervention, which improved at 1, 3 and 6 months after the program intervention with highly significant differences between pre- and post intervention. As well, the majority of the studied patients had adequate self-care practices post program intervention and during the follow up period. There was also a highly significant difference between the patients' adherence to the anti hypertension medication pre and post program Conclusion: The counseling program improved patients' knowledge, self care practices and adherence to the anti hypertensive medication Recommendation: The study should be replicated on a larger sample and different hospitals and community settings in order to generalize the results.

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### Introduction

A silent condition, such as hypertension, that leads to devastating co-morbidities (e.g., cardiovascular diseases, stroke and renal failure) requires an arsenal of tailored, persuasive messages when counseling opportunities arise. High blood pressure is one of the 10 leading health risks worldwide and causes 7 million deaths a year, according to WHO's report 2002. More than three-quarters of cardiovascular diseases can be traced to high blood pressure, high cholesterol, tobacco use, or a combination of those factors (Khanderia *et al.*, 2008).

Ibrahim *et al.* (2012) stated that, the hypertension is highly prevalent in Egypt and that the rates of hypertension awareness, treatment, and control are relatively low. Meanwhile, the first time data about the magnitude of hypertension problem nationwide in an Arab country. The prevalence rates of hypertension in Egypt are among the highest in the world with a national estimate of 26.3% in adult population. There is an impressive increase in prevalence rates with aging; approximately 60% of individuals above the age of 60 years suffer from

hypertension. The study also showed that rates of hypertension awareness, treatment and control are very low. These observations encourage the development of national campaigns in order to increase public awareness and alert health planner to start prevention programs and improve education and training.

Hypertension is defined as a blood pressure (BP) (systolic/diastolic) 140/90 mm Hg (WHO, 2003). In both developing and developed regions it is a major cause of morbidity and mortality, particularly cardiovascular and renal diseases (Alhalaiqa *et al.*, 2012). Hypertension is classified as either primary (essential) hypertension or secondary hypertension; about 90–95% of cases are categorized as "primary hypertension" which means high blood pressure with no obvious underlying medical cause. The remaining 5–10% of cases (secondary hypertension) are caused by other conditions that affect the kidneys, arteries, heart or endocrine system (Marshall *et al.*, 2012). However, the (JNC, 7) (2006) simplifies the classification of blood-pressure levels and outlines how to use this new classification scheme for hypertension prevention and management. BP Scheme

for Adults (in mmHg) are; Normal: systolic BP <120 and diastolic BP <80, Prehypertension: SBP 120-139 or DBP 80-89, Stage 1 hypertension: SBP 140-159 or DBP 90-99 and Stage 2 hypertension: SBP  $\geq$ 160 or DBP  $\geq$ 100. Additionally, definition of third stage (stage III hypertension) is for people with systolic blood pressure exceeding 179 mmHg or a diastolic pressure over 109 mmHg. Hypertension is classified as "resistant" if medications do not reduce blood pressure to normal level.

Hypertension responds to both lifestyle changes and pharmacotherapy, recommends exercise, exercising 30 minutes daily is associated with a reduction of 4 to 9 mm Hg; weight reduction by 10 kg (22 lb) reduces blood pressure by 5 to 20 mmHg, sodium restriction can affect pressure by 2 to 4 mmHg, moderation of alcohol intake, and a diet rich in fruits and vegetables and low in fat for all stages. Pharmacologic treatment options include > 50 agents, as well as combinations of agents, in 14 classes (**Kotchen, 2011**). The reduction in BP is associated with reductions in the incidence of stroke and cardiovascular heart disease. However, systolic blood pressure (SBP) has the stronger association (compared with diastolic blood pressure (DBP)) with the global disease burden attributable to hypertension. The risk of cardiovascular disease and stroke rises continuously as SBP increases above 115 mmHg (**Kokubo et al., 2008 & NHFA, 2010**).

Worldwide successful control of hypertension is poor with only 5–58% of people taking antihypertensive medications managing to achieve a BP of less than 140/90 mmHg. One of the major factors in this poor control is lack of patient adherence to treatment (**Abdelmoneim, 2011**). Adherence behaviors are complex, ranging from completely ceasing to take prescribed medications, to taking only some, to taking them in a way that differs from instructions for example, not after food. Overall hypertensive patients are estimated to take only 53–70% of the medication prescribed for them (**Morisky et al., 2008**). Factors that affect adherence are complex but may include beliefs about illness and treatment, side effects and complexity of treatment regimes (**Okken, 2008**).

Adherence or compliance, in the context of medical treatment, refers to how well patient follows and sticks to the management plan developed with health care provider, which may include pharmacologic agents as well as changes in lifestyle (**AL-Rukban 2007**). The most commonly used definition of compliance or adherence is "patient's behaviors (in terms of taking medication, following diets, or executing life style changes) coincide with healthcare providers' recommendations for health and medical advice". Patients' non-adherence, or

noncompliance, is common in chronic asymptomatic conditions such as high blood pressure. Non-compliance leads to poor blood pressure control and a deleterious outcome (stroke and coronary heart disease). As well, non-compliance can cancel out the efforts that go into diagnosis, diagnostic work-up, and counseling of hypertensive patients (**Haynes et al., 2008**). In fact, non-adherence costs our society millions of dollars every year in ineffective therapeutic efforts. Hence, therapeutic compliance has been a topic of clinical concern since the 1970s due to the widespread nature of non-compliance with therapy. Therapeutic compliance not only includes patient compliance with medication but also with diet, exercise, or life style changes (**Kokubo et al., 2008**).

The patients' beliefs about medicines aid to understanding people's perceptions about medicines, and their adherence (or non-adherence) to prescribed medication regimes. Non-adherence to prescribed medicines can pose a significant threat to the success of medical treatments and intended improvements in health outcomes. Various reasons for low adherence have been reported, and these can be categorized as non intentional and intentional non adherence. Non-intentional non-adherence is often the result of poor memory or understanding (**Atkins & Fallowfield, 2006**). The reasons for intentional non-adherence are less straightforward and include problems experienced as a direct result of taking medicines (such as adverse drug reactions), inability to pay for medicines, disagreement with the need for pharmacological treatment, or other patient-specific issues associated with complex behavioral characteristics. Beliefs about medicines are most likely to be associated with intentional non-adherence (**Porteous et al., 2010**).

Counseling hypertensive patients requires insight, creativity, and ingenuity, because fixed messages will fall flat. Nevertheless, effective counseling covers 3 essential themes: improving health status with adherence, providing information on adverse effects and contraindications, and promoting healthy behaviors. Always begin by asking patients what prescribers told them previously, in order to save time and to identify information deficits quickly. Intensive counseling can get people to make a wide array of lifestyle and dietary changes that will reduce their risk of developing high blood pressure (**Heymann et al., 2011**).

There is more opportunity to have a well-functioning organization to treat patients with hypertension both non-pharmacologically and pharmacologically when nurses and physicians work together in a team. There are no appreciable differences in care between nurses and physicians in terms of the health outcomes for patients, in the process of care or the costs, but patient satisfaction is

higher with nurse-led care according to a Cochrane review (**Laurant et al., 2004**). It is important that the patients are given knowledge about the meaning of hypertension and are counseled on lifestyle changes when they visit their health centre. An extra complicating factor is the fact that many hypertensive patients do not have just one risk factor to deal with but several. As a result, heavy demands are imposed on the nurses to enable them to help the patients achieve lifestyle change (**Abdulameer 2012**). The change in lifestyle is meant to increase blood pressure control and reduce cardiovascular complications. The nurse has to help the patients to understand that medications and lifestyle modifications can control but are generally unable to cure hypertension and to persuade them to use specific strategies to achieve the necessary lifestyle changes regarding smoking, alcohol, weight, diet, physical activity and stress (**American Heart Association. Heart Disease and Stroke Statistics, 2006**).

#### **Significance of the study**

Medicines are prescribed with the aim of preventing, treating and curing diseases. The costs of prescribed medicines have risen over time and are expected to increase over the next few years as well. Some of these extra costs are the result of new and more expensive medicines and an increase in the volume of medicines. Hypertension prevalence as well as awareness, treatment, and control rates varied by region, with Cairo having the highest prevalence (31.0%) and the Coastal Region having the highest control rate (15.9%). Rates of awareness, treatment, and control tended to be lowest in areas of lower socioeconomic status. The hypertension is highly prevalent in Egypt and that the rates of hypertension awareness, treatment, and control are relatively low. These findings argue for a nationwide effort to prevent and control high blood pressure in Egypt in order to avert an epidemic of cardiovascular disease.

Nurses and other health care professionals have an important role to increase patient adherence with therapeutic regimens through determining the factors affecting adherence of patients with hypertension toward therapeutic regimen, which is essential to reducing the level of non-compliance in general, quality outcomes while decreasing costs, resource consumption, and mortality rate (**Morisky et al., 2008**). So, Nurse also plays a pivotal role in improving the general well-being of patients by patient education, support and evaluation to increase patient involvement and self-reliance in the management of hypertension.

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

The aim of this study was to evaluate the effect of counseling on patients' adherence regarding anti

hypertensive therapeutic regimen. This aim was achieved through the following:

- Assessing patients' knowledge, self-care practices and beliefs regarding the anti hypertension therapy to identify their needs.
- Assessing the factors affecting adherence toward therapeutic regimen for patients with hypertension
- Developing and implementing a counseling program for patients with hypertension.
- Evaluating the effect of counseling program on patients' adherence with anti hypertensive therapeutic regimen.

#### **Hypotheses**

It was hypothesized that:

- The counseling program will have a positive effect on patients' knowledge toward anti hypertensive therapeutic regimen.
- The counseling program will have a positive effect on patients' adherence to the anti hypertensive medication.
- The counseling program will have a positive effect on patents' self care practices toward the hypertension
- The counseling program will have a positive effect on patients' beliefs toward the anti hypertensive therapeutic regimen

#### **Subject and Methods.**

##### **Research Design:**

A quasi experimental design was utilized to achieve the aim of this study.

##### **Setting:**

This study was conducted at Cardiac Outpatient Clinic in Ain Shams University Hospital.

##### **Study Subjects:**

A purposive sample including 60 adult patients with primary (essential) or secondary hypertension from the above mentioned setting were recruited for the study. The sample size calculated statistically by power and sample size was calculated statistically by power and sample size calculation program to give of 80%.

##### **Inclusion criteria:**

Patients had been diagnosed with high blood pressure for at least 6 months and had been prescribed antihypertensive medication.

##### **Exclusion criteria:**

Patients who had severe health problems or cognitive impairments and were not complete the interview were excluded from this study.

##### **Tools of the study:**

Data were collected through the following tools

1. **Patient Interview Questionnaire Sheet:** It was adopted from (**Heymann, 2011**). This tool was revised by a group of five expertises in medical

surgical nursing, two expertises in community health nursing and two expertises in obstetric nursing at the faculty of Nursing, Ain Shams University for the content validity. No modifications were done. This tool includes the following parts:

**Part 1: Patients' demographic characteristics and clinical data.**

It included the Patients' age, gender, level of education, occupation, marital status, income, medical history, BMI, smoking, duration of illness, number of comorbid diseases, systolic and diastolic blood pressure, prescribed medication for hypertension and blood pressure controlled.

**Scoring system**

Patients' body mass indexes (BMI) were estimated pre guidelines intervention.  $BMI = \text{weight (Kg)} / \text{height (m)}^2$ . Patients were considered underweight if  $BMI < 18.5$ ; normal weight if  $BMI 18.5 - 24.9$ ; over weight if  $BMI 25 - 29.9$  and obese if  $BMI > 30$ . It was adopted from (Gupta *et al.*, 2007).

**Part 2: Patients' Knowledge** regarding hypertension: It was used to assess knowledge about hypertension. It was filled in by the researchers. It consisted of three sections. Section 1 included, hypertension information (definition, signs & symptoms and complications). Section 2 included, management of the hypertension. Section 3 included self-care activities (medication, diet, physical activities, weight reduction, smoking & alcohol) and follow up...etc. The total score of knowledge was 100 degrees distributed on its parts according to the weight and importance of each question. The questions were in the form of multiple-choice, true & false, and short essay questions. A score of one was given for each correct answer and zero for incorrect one. For each area of knowledge, the scores of the items were summed up and the total score divided by the number of the items. These scores were converted into a percent score. The total patients' knowledge was considered satisfactory if the percent score was 60% or more, and unsatisfactory if less than 60%.

**Part 3: Factors affecting Patients' adherence toward hypertensive therapeutic regimen.** Adopted from Jin *et al.* (2008), it included: Patient - related factors as demographic characteristics such as age, gender, education, and employment status. Health care system factors such as insurance status. Social and economic factors such as income, residence, marital status and disease factors such as body mass index, duration of illness and number of comorbid diseases. Therapy-related factors such as physician prescribed medication, numbers of medication administration and blood pressure controlled.

**Part 4: Obstacles affecting compliance with follow up visits, reasons for poor adherence and**

**suggestion for improving hypertensive therapeutic regimen.**

Adopted from Ambrosionia *et al.* (2000), the obstacles affecting compliance were measured post program intervention and included the following: Patients not understanding the importance of the medication, not accepting the nature of the disease, laziness, busy work, far distance, shortage of money, difficult transportation, out patient clinic crowding and increase waiting time. Meanwhile, it was constructed in the form of "Yes" and "No" answers.

**2. Patient's Adherence Assessment Sheet:** it was used to assess adherence with medication and self care activities. This tool will be divided into 2 parts:

**Part 1: Morisky Medication Adherence Scale (MMAS):** Adopted from Morisky *et al.* (2008), it was used to assess the patient adherence to medication for the patient with hypertension, it was comprised four questions with a yes/no answer format (do the patient ever forget to take the medicine? Are the patients careless at times about taking the medicine? When the patients feel better do sometimes stop taking the medicine? and sometimes the patient feel worse when taking the medicine, do stop taking it? The resulting score ranges from 0 to 4 points, and the (0 point) indicates high adherence, 1-2 points indicate medium adherence, and low adherence (3-4 points). The MMAS scores can range from 0 to 8 and have been dichotomized previously into the following 3 levels of adherence to facilitate use in clinical practice: high adherence (score, 8), medium adherence (score, 6 to <8), and low adherence (score, <6).

**Part 2: Hypertension Self-Care Activity Level Effects (H-SCALE):** Adopted from Warren-Findlow and Seymour (2011), it was used to assess the 6 prescribed self-care activities: Adherence to medication, weight loss or maintenance of ideal body weight, adoption of a low-salt diet, regular physical activity for 30 minutes most days of the week, limiting alcohol intake, and ceasing tobacco use. These response categories were chosen specifically to explore a dose-response relationship between the various hypertension self-care activities and blood pressure, to ultimately determine the relative contribution of each activity to blood pressure management.

**Measures and scoring system of hypertension self-care activity level effects:**

**Medication adherence:**

Three items assessed the number of days in the last week that an individual: (1) takes blood pressure medication, (2) takes it at the same time every day, and (3) takes the recommended dosage. Responses were summed (range, 0-21), and participants reporting that they followed these 3 recommendations on 7 out of 7 days were considered adherent (score = 21).

**Low-salt diet:**

Twelve items assessed practices related to eating a healthy diet, avoiding salt while cooking and eating, and avoiding foods high in salt content. Nine items were negatively phrased; these items were reverse coded. A mean score was calculated. Scores of 6 or better (indicating that participants followed low-salt diet practices on 6 out of 7 days) were considered adherent.

**Physical activity:**

Physical activity was assessed by 2 items. "How many of the past 7 days did you do at least 30 minutes total of physical activity and "how many of the past 7 days did you do a specific exercise activity (such as swimming, walking, or biking) other than what you do around the house or as part of your work. Responses were summed (range, 0-14). Participants who scored an 8 or better were coded as adhering to physical activity recommendations; all others were non adherent. This designation was chosen to ensure that participants had to report some combination of both physical activity and exercise in order to be considered adherent.

**Smoking:**

Smoking status was assessed with 1 item, "How many of the past 7 days did you smoke a cigarette or cigar, even just one puff?" Respondents who reported 0 days were considered a nonsmoker. All others were categorized as smokers.

**Weight management:**

These 10 items assess activities undertaken to manage weight through dietary practices such as reducing portion size and making food substitutions as well as exercising to lose weight. Items assessed agreement with weight management activities during the past 30 days. Response categories ranged from strongly disagree (1) to strongly agree (5). Responses were summed creating a range of scores from 10 to 50. Participants who reported that they agreed or strongly agreed with all 10 items (score  $\geq 40$ ) were considered to be following good weight management practices.

**Alcohol:** Alcohol intake was assessed using an existing measure, the 3-items. Participants who indicated that they usually did not drink at all were considered abstainers. All others were non adherent.

**III- The Beliefs about Medicines Questionnaire (BMQ):** Adopted from **Horne and Weinman (1999)**, it was used to measure the patients' attitudes and beliefs toward medication. Beliefs of patients have about medicines in general and their adherence (or non-adherence) to prescribed medication regimes. It consists of twelve statements, which can be divided into three sub-parts: General-Harm (G-H), General-Benefit (G-B) and General-Overuse (G- O). General-Harm, with five statements,

measures beliefs about harmful effects of medicines. General-Benefit, with four statements, stands for beliefs of the benefits of medicines. General-Overuse, with three statements, measures peoples' beliefs about whether doctors overprescribe medicines. All the statements are answered on a five-point Likert scale: 1=strongly disagree, 2=disagree, 3=uncertain, 4=agree and 5=strongly agree. Mean scores were calculated for each participant and for all BMQ sub-parts from one to five. A higher mean indicated a stronger belief in the concept described. Scores for each of the BMQ-General sub-scales range from 4 to 20.

**Counseling Program For Patients Receiving Hypertension Therapeutic Regimen:**

It was designed to improve patients' compliance toward hypertension therapeutic regimen through individualized counseling with each patient involved in the study. The content of the counseling program was designed by the researchers based on the related literature identifying learning needs (**Drevenhorn et al., 2001; Kokubo et al., 2008; Porteous et al., 2010; Sharaf, 2010; Heymann et al., 2011 and Abdulameer, 2012**). The counseling program was written in Arabic language to give basic knowledge about hypertension as: definition, signs and symptoms, complications, management, follow up; and hypertension self-care activities as: adherence to medication, weight loss or maintenance of ideal body weight, adoption of a low-salt diet, regular physical activity for 30 minutes most days of the week, limiting alcohol intake, ceasing tobacco use as well as, self monitoring of blood pressure. The counseling program was revised by a group of five expertises in Medical Surgical Nursing and two expertises in Community Health Nursing at the faculty of Nursing and two expertises in medicine at the faculty of Medicine, Ain Shams University for the content validity. Based on the opinion of the panel of expertises some modifications were done, and then the final forms were developed.

**Pilot study:**

Before conducting the actual study a pilot study was performed on 10% of the total patients who were later excluded from the main study sample. The pilot study was conducted for the purpose of testing the clarity, arrangement of items and the applicability of the tools and to test the feasibility of subjects, setting and time. Based on the opinion of a panel of expertise and the result of the pilot study, modification and omission of some details were done and then the final forms were developed.

**Operational Design:**

This study was conducted through four phases: assessment, planning, implementation and evaluation.

**1- Assessment phase:**

This phase aimed to prepare the study tools, collect data from patients under study, identify the patients' knowledge, beliefs, daily self activities and compliance toward hypertension therapeutic regimen before counseling program implementation.

**2- Planning (preparatory) phase:**

Based on the assessment phase, the program content and media (in the form of the program booklet, posters, and visual materials) were prepared by the researchers for the patients under study based on patients' learning needs.

**3- Implementation phase:**

The counseling sessions were implemented according to the five stages of counseling process that uses the acronym **DASIE** technique whose components are: (1) **Develop** the relationship, identify and clarify problem(s); (2) **Assess** problem(s) and redefine in skills terms; (3) **State** working goals and plan interventions; (4) **Intervene** to develop self-helping skills; and (5) **End** and consolidate self-helping skills (**McLeod & Wheeler, 1995**).

Every patient was interviewed individually by the researcher at the Cardiac Out Patient Clinic. The counseling sessions were planned and implemented according to each patient' learning needs. Each session lasted from 45-60 minutes. Counseling was aided by the use of the posters, real objects as sphygmomanometer and the program booklet.

Data collection of and program application lasted over a period of eight months, started from beginning of March 2012 to beginning of November 2012. Data were collected three days / week from 9.00 am. to 3.00 pm. according the out patient clinic visiting hours and the presence of the patients.

**4- Evaluation phase:**

The evaluation phase was emphasized on estimating the effect of the counseling program on patients knowledge, beliefs and adherence with the hypertension therapeutic regimen 1, 3 and 6 months after the program implementation.

**Administrative design and ethical consideration:**

An official permission was obtained from the Director of Ain Shams University Hospital and the Head of the Cardiac Outpatient Clinic in which the study was conducted. Meeting and discussions were held between the researchers and administrative personnel to make them aware about the aim and objectives, as well as to get better cooperation during the implementation phase. It was important to have their full support, especially to find out some sort of motivation to stimulate patients to participate positively in the study. The aim of the research was explained to the participants. Verbal consent was obtained from each patient who agreed to participate in the study, after clarifying the procedures of the

study. Participants were informed about their right to refuse participation and withdraw at any time without giving any reason, or any consequences. Confidentiality of data was ensured and they will be used for research purposes and their benefits.

**Data analysis:**

Data entry and analysis were done using the Statistical Package for Social Science (SPSS) version 20. Data were presented in tables and charts using numbers and percentages. Appropriate statistical methods were applied (percentage, chi- square ( $X^2$ ), and *t* test. Regarding *P*- value, it was considered non-significant (NS) if  $P > 0.05$ , Significant (S) if  $P < 0.05$ , and Highly Significant (HS) if  $P < 0.001$ .

**Results**

The characteristics of patients in the study sample are described in table (1) more than three quarters (76.6%) of studied patients their age ranged between 50 - 60+ years, with a mean age of  $56.41 \pm 8.09$ , more than half (53.3 %) were male and more than quarter of them (26.7%) had no formal education. Less than one third of them (31.7 %) were not employed and one third (33.3%) were retired. More than half of them (53.3 %) were smokers and 55.0 % of them had health Insurance. Three fifths of them (61.6 %) had insufficient income monthly. As regards residence and marital status, less than half of them (46.7%) were from urban areas and 36% of them were married. Meanwhile, all of the patients (100 %) didn't receive previous counseling program regarding hypertension medication.

**Table (2)** reveals the distribution of the studied patients according to their clinical data characteristics. It shows that 33.4% of the studied patients were overweight and 80.0% of study subjects their duration of illness was more than one year. One third (33.3%) of study subjects had 3-4 numbers of comorbid diseases. pre counseling program intervention the mean score of the systolic blood pressure was  $190 \pm 11.18$  and diastolic blood pressure was  $110 \pm 10.19$ . It was gradually decreased after 1 and 3 months of intervention and slightly increased after 6 months. Three quarters of the study sample (75.0%) had sometimes blood pressure controlled as compared to 16.7% of them had blood pressure controlled. The majority of the studied subjects (80.0%) had taken medication for hypertension according the physician prescription. More than three quarters of them their medication were relating cardiac (80%), diabetes mellitus (88.3%) and hypercholesterolemia (75%).

**Figure (1)** shows the total patients' knowledge regarding hypertension, medication and proper diet pre and post counseling program intervention. It shows that there were highly statistically significant differences between patients' knowledge pre and post

1, 3 and 6 months after program intervention. ( $P < 0.000$ ).

**Table (3)** reveals the total patients adherence with anti hypertensive medication pre and post counseling program intervention. This table indicates that the rate of high adherence with anti hypertensive medication was 20% before intervention and this rate increased to three quarters (75.0%) after 1 month and reduced after 3 months to 50.0% and more reduction was present at 6 months to 25.5%. There was a significant difference between pre and post program intervention phases ( $p < 0.05$ ).

**Table (4) and fig. (2)** describe the hypertension self care activities level differences among the studied patients pre and post counseling program intervention. they show a significant improvements between pre and post-tests regarding medication usage, low salt diet, physical activity, smoking and weight management. Meanwhile these improvements insignificantly decreased at post-test 3 months and 6 months post intervention.

As regards to general health beliefs regarding to anti hypertensive medication, **Table (5)** reveals that there were highly statistically significant improvement in post-test 1 month regarding all items related to general harm, over use and benefits from anti hypertension medication *except* one item in general over use related to if doctors had more time with their patients they would prescribe fewer medicines. Meanwhile, there was a gradual reduction in improvements of the general health beliefs at 3 and 6 months. There were highly significant differences between pre and post counseling program intervention ( $P < 0.000$ ).

**Fig. (3)** presents the obstacles affecting compliance with follow up visits as stated by patients under study. It describes that, the most common obstacles facing the patients were outpatient clinic crowding (83.3%), not understanding the importance of long-term continuing treatment (76.7%), increasing the waiting time (75.0%), refusal to accept the chronic nature of the disease (71.7%), difficult transportation (50%), shortage of money (43.3%), far distance (41.7%), busy work (21.7%) and laziness (13.3%) were the obstacles affecting compliance with follow up visits.

**Fig. (4)** shows the common reasons for poor antihypertension therapeutic adherence as stated by the patients under study pre program intervention, it was showed that, there were lack of understanding of the importance of long term continuing treatment (76.70 %), side effects of the drugs (75%), forgetfulness of the prescriptions (75%), complexity of the drugs regimen (73.30%) and refusal to accept

the chronic nature of the disease (71.70%). Meanwhile, there was a significant improvement in these reasons in post intervention than before intervention  $P < 0.001$

**Fig. (5)** illustrates the suggestions to improve the adherence to the anti hypertensive medication as stated by patients under study at pre and post counseling program intervention. As regards pre program intervention, it shows that, less than half of the studied patients suggested and emphasized on the importance of good physician and nurse patient interaction (48.30%), improved tolerability profile of drugs (43.30%), and single-agent therapy (28.30%). However, 11.70% of the patients suggested that the dose of the drug should be simplified and only 8.30% emphasized on the importance of educational interventions and information to patient. Meanwhile, there was a significant improvement in post program intervention regarding all items of suggestions provided by the patients.

**Table (6)** reveals correlations between anti hypertensive medication adherence among patients' pre counselling intervention and demographic characteristics. There were positive correlations between low level of hypertensive medication adherence and their old age, unemployment, insufficient income, rural area and married.

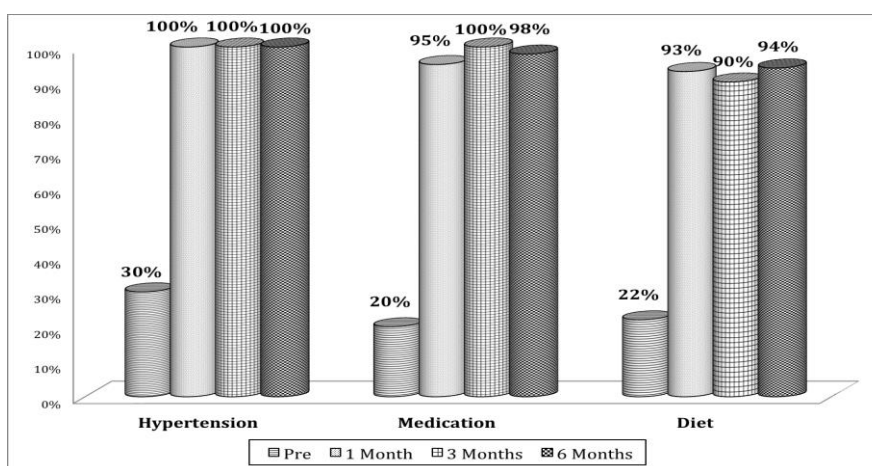
**Table (7)** reveals correlations between anti hypertensive medication adherence among patients' pre counselling intervention and clinical data characteristics. There were positive correlations between low level of hypertensive medication adherence and their duration of illness  $> 1$  year, number of comorbid diseases from 3-4 diseases, physician prescribed medication for hypertension, number of hypertension medication  $> 2$  drugs and sometimes blood pressure controlled.

**Table (8)** reveals the correlations between hypertensive self care activities' adherence among patients' pre counselling intervention and their demographic characteristics. There were positive correlations between unsatisfactory level of self care activities adherence and their old age (60+), male, no formal education, unemployed, smokers, insufficient income, rural area and married.

**Table (9)** displays the correlations between total level of hypertensive self care activities' adherence among patients' pre counselling intervention and clinical data characteristics. There were positive correlations between unsatisfactory level of self care activities' adherence and their overweight, duration of illness  $> 1$  year, number of comorbid diseases from 3-4 diseases and sometimes blood pressure controlled.

**Table (1): Distribution of the studied patients according to their demographic related characteristics (n = 60).**

Items	Patients' number (60)	
	No	%
<b>Age</b>		
➤ 40 -	14	23.3
➤ 50 -	23	38.3
➤ 60+	23	38.3
Range	Min 39 - max 70	
Mean $\pm$ SD	56.41 $\pm$ 8.09	
<b>Gender</b>		
➤ Male	32	53.3
➤ Female	28	46.7
<b>Education</b>		
➤ No formal education	16	26.7
➤ Read and write	14	23.3
➤ Basic	15	25
➤ University	15	25
<b>Employment status</b>		
➤ Not employed	19	31.7
➤ Employed	17	28.3
➤ Retired	20	33.3
➤ Disability	4	6.7
<b>Smoking</b>		
➤ Yes	32	53.3
➤ No	28	46.7
<b>Income</b>		
➤ Insufficient	37	61.6
➤ Sufficient	23	38.4
<b>Insurance status</b>		
➤ Yes	33	55.0
➤ No	27	45.0
<b>Residence</b>		
➤ Rural	32	53.3
➤ Urban	28	46.7
<b>Marital status</b>		
➤ Married	22	36.7
➤ Single	38	63.3
<b>Attending previous program regarding hypertension</b>		
➤ No	60	100

**Fig. (1): Difference between patients' knowledge pre/post program phases regarding hypertension and its therapeutic regimen**



**Table (2): Distribution of the studied patients according to clinical data characteristics (n=60).**

Items	No	%
<b>Body mass index</b>		
➤ Ideal	26	43.3
➤ Overweight	20	33.4
➤ Obese	14	23.3
<b>Duration of illness (in years)</b>		
➤ <1	12	20.0
➤ >1	48	80.0
<b>Number of comorbid diseases</b>		
➤ Unknown	18	30.0
➤ No other diseases	10	16.7
➤ 1-2	12	20.0
➤ 3-4	20	33.3
<b>Blood pressure controlled:</b>		
➤ Yes	10	16.7
➤ Sometimes	45	75.0
➤ No	5	8.3
<b>Blood Pressure</b>		
<b>Systolic blood pressure</b>		(±SD)190 ±11.18
➤ Pre		(±SD) 160 ±58.33
➤ Post (1) month		(±SD) 144 (±18.11)
➤ Post (3) month		(±SD) 150 (±11.18)
➤ Post (6) month		
<b>Diastolic blood pressure</b>		(±SD)110 ±10.19
➤ Pre		(±SD) 91 ±25.00
➤ Post (1) month		(±SD) 86 (±11.18)
➤ Post (3) months		(±SD) 95 (±10.19)
➤ Post (6) months		
<b>Physician prescribed medication for hypertension</b>		
➤ Yes	48	80.0
➤ No	12	20.0
<b>Number of hypertension medication</b>		
➤ 1	5	8.3
➤ 2	10	16.7
➤ > 2	45	75.0
<b>Other medications</b>		
➤ Cardiac	48	80.0
➤ Diabetes mellitus	53	88.3
➤ Cholesterol	45	75.0
➤ Urinary disorders	15	25.0
➤ Others	10	16.7

**Table (3): Total adherence with anti hypertensive medications among patients pre/post counselling program phases' intervention (n = 60).**

Adherence	Pre		Post						Test		
	No	%	1 month		3 months		6 months		X <sup>1</sup>	X <sup>2</sup>	X <sup>3</sup>
			No	%	No	%	No	%			
Low (>6)	25	41.7	6	10.0	10	16.7	5	8.3	36.8*	14.3*	18.2*
Medium (6 to <8)	23	38.3	9	15.5	20	33.3	40	66.7			
High (8 +)	12	20.0	45	75.0	30	50.0	15	25.5			

(\*) Statistically significant at  $p < 0.05$ **Table (4): Differences between patients mean score regarding hypertension self care activities level pre/post counselling program phases' intervention (n. 60).**

Self-care Activities	Pre	Post				Test		
	Mean ±SD	1 month	3 months	6 months	X <sup>1</sup>	X <sup>2</sup>	X <sup>3</sup>	
		Mean ±SD	Mean ±SD	Mean ±SD				
Medication usage	48.7±0.7	91.7±0.2	89.9±0.4	88.4±0.3	45.2**	43.4**	42.1**	
Low-salt diet	20.1±0.9	75.3±0.5	91.7±0.2	80.7±0.4	41.1**	58.2**	46.6**	
Physical activity	10.0±1.0	50.0±0.7	41.7±0.7	41.7±0.7	25.3**	20.0**	20.0**	
Smoking	66.7±0.6	66.7±0.6	66.7±0.6	66.7±0.6	-	-	-	
Weight management	66.7±0.6	91.7±0.2	88.3±0.3	90.0±0.2	29.7**	27.5**	29.4**	
Alcohol intake	10.0±1.0	10.0±1.0	10.0±1.0	10.0±1.0	-	-	-	

(\*\*) Highly statistically significant at  $p < 0.01$

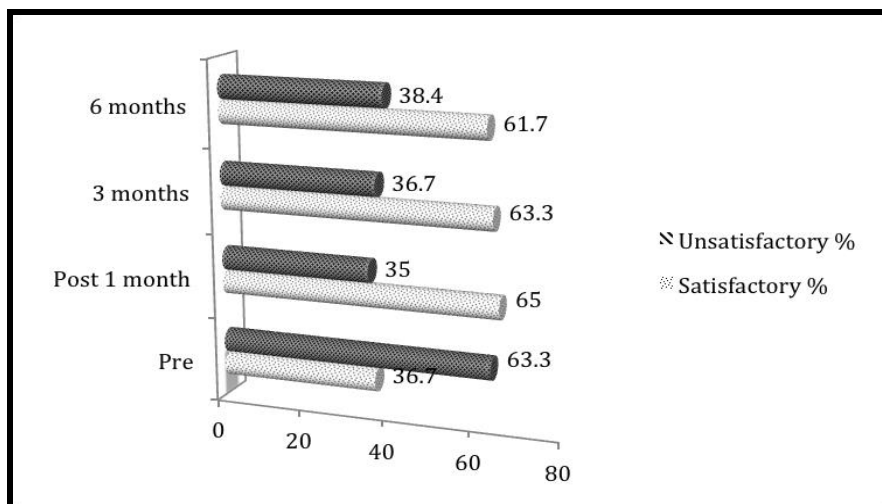


Fig. 2: Relation between total level of hypertension self care activities pre/post counseling program intervention.

Table (5): Percentage distribution of general health beliefs regarding anti hypertension medication as stated by the patients pre/post counseling program phases' intervention (n. 60).

Beliefs Items	Pre		Post						X <sup>2</sup> Test			
			1 month		3 months		6 months		X <sup>2</sup>	X <sup>2</sup>	X <sup>2</sup>	
	No	%	No	%	No	%	No	%				
<b>➤ General - harm</b>												
People who take medicine should stop their treatment for a while every now and again	53	88.3	25	41.7	40	66.7	33	55.0	28.7**	8.1**	16.4**	
Most medicines are addictive	50	83.3	12	20.0	6	10.0	55	91.7	48.2**	64.8**	1.9	
Medicine do more harm than good	33	55.0	5	8.3	15	25.0	15	25.0	30.2**	11.3**	11.3**	
Natural remedies are safer than medicines	33	55.0	5	8.3	7	11.7	10	16.7	30.2**	25.4**	19.2**	
All medicines are poison	55	91.7	5	8.3	7	11.7	15	25.0	83.3**	76.9**	54.9**	
<b>➤ General - over use</b>												
Doctors use too many medicines	60	100.0	33	55.0	15	25.0	6	10.0	34.8**	72.0**	98.2**	
Doctors place too much trust in medicines	30	50.0	55	91.7	55	91.7	55	91.7	25.2**	25.2**	25.2**	
If doctors had more time with their patients the would prescribe fewer medicines	30	50.0	30	50.0	30	50.0	30	50.0	0.0	0.0	0.0	
<b>➤ General - benefits</b>												
Without medicines doctors would be less able to cure their patients	55	91.7	15	25.0	6	10.0	10	16.8	54.9**	80.1**	68.0**	
Medicines help many people to live better lives	30	50.0	55	91.7	55	91.7	55	91.7	25.2**	25.2**	25.2**	
Medicines help many people to live longer	10	16.7	60	100.0	55	91.7	55	91.7	85.7	68.0**	68.0**	
In most cases the benefits of medicines not outweigh the risks	55	91.7	15	25.0	6	10.0	10	16.8	54.9**	80.1**	68.0**	

Statistically insignificant at  $p > 0.05$ ;

(\*\*) Highly statistically significant at  $p < 0.01$

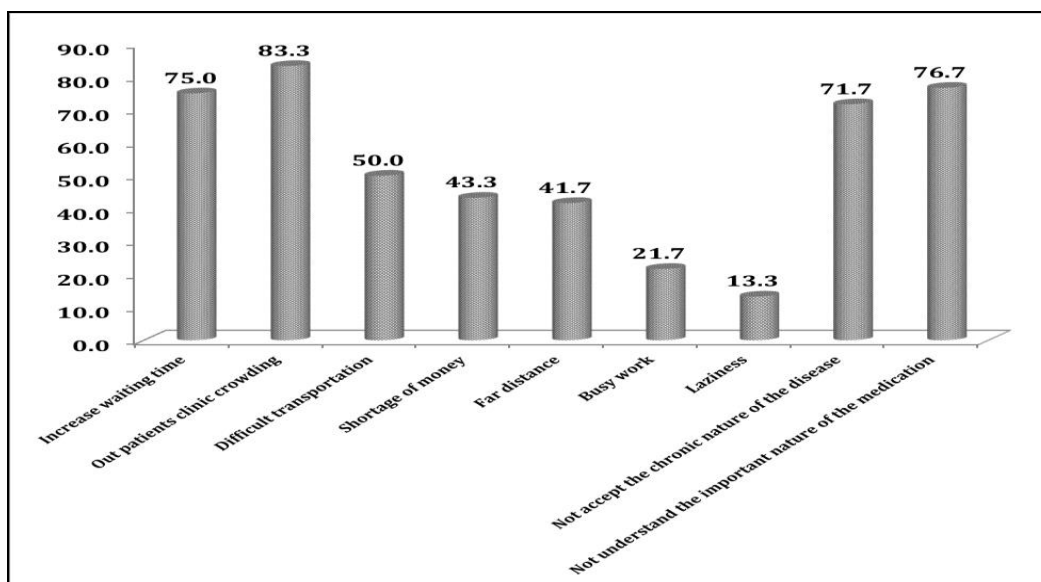


Fig. (3): Percentage distribution of obstacles affecting compliance with follow up visits as stated by patients under study.

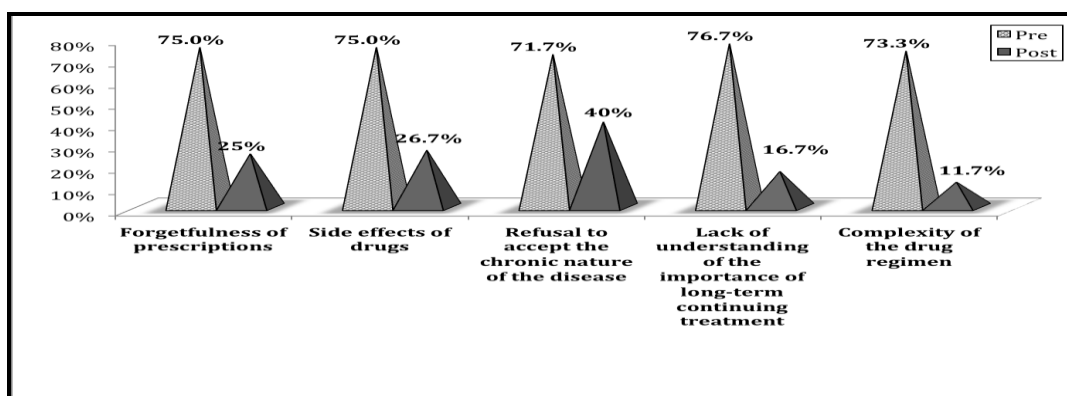


Fig. (4): Relations of poor anti hypertension therapeutic adherence reasons as stated by of patients under study pre/post counseling program intervention.

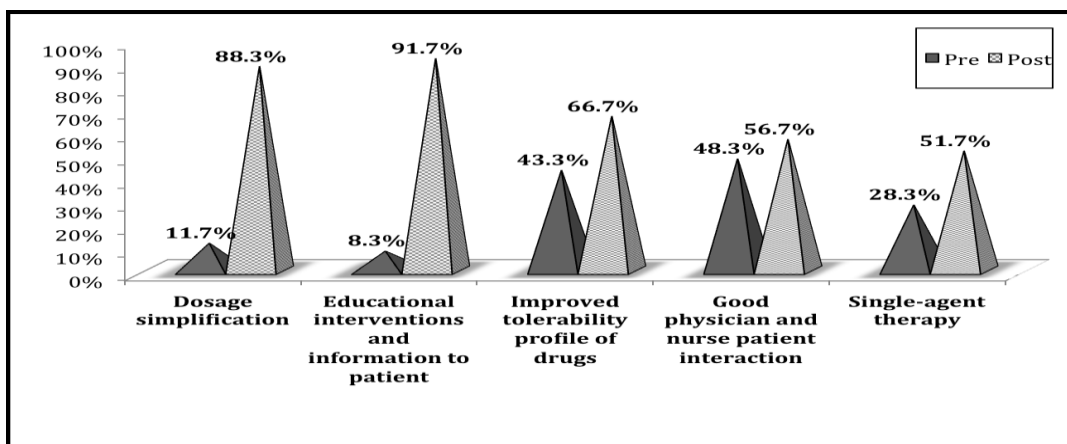


Fig. (5): Relations of suggestions to improve anti hypertension medication adherence as stated by patients under study at pre/post counseling program intervention.

**Table (6): Correlations between anti hypertensive medication adherence among patients' pre counselling intervention and demographic characteristics.**

Demographic Characteristics	Hypertensive Medication Adherence			Total No	X <sup>2</sup> Test
	LowNo. 25	Medium No.23	HighNo. 12		
<b>Age:</b>					
➤ 40-	2	7	5	14	14.1**
➤ 50-	7	12	4	23	
➤ 60+	16	4	3	23	
<b>Gender:</b>					
➤ Male	17	10	5	32	3.7
➤ Female	8	13	7	28	
<b>Education:</b>					
➤ No formal education	9	5	2	16	5.3
➤ Primary	2	7	4	13	
➤ Secondary+ University	14	11	6	31	
<b>Employment status:</b>					
➤ Not employed	14	3	2	19	13.6*
➤ Employed	4	8	5	17	
➤ Retired	5	11	4	20	
➤ Disability	2	1	1	4	
<b>Smoking:</b>					
➤ Yes	15	12	5	32	1.1
➤ No	10	11	7	28	
<b>Income:</b>					
➤ Insufficient	22	11	4	37	13.3**
➤ Sufficient	3	12	8	23	
<b>Insurance status:</b>					
➤ Yes	11	14	8	33	2.2
➤ No	14	9	4	27	
<b>Residence</b>					
➤ Rural	21	8	3	32	16.5**
➤ Urban	4	15	9	28	
<b>Marital status</b>					
➤ Married	14	6	2	22	7.2*
➤ Single	11	17	10	38	
<b>Attending previous program regarding the hypertension</b>					
➤ No	25	23	12	60	NA

Statistically insignificant at  $p > 0.05$  (\*) Statistically significant at  $p < 0.05$  (\*\*) Highly statistically significant  $p < 0.01$

**Table (7): Correlations between anti hypertensive medication adherence and clinical data characteristics among patients' pre counselling intervention.**

Clinical Data Characteristics	Hypertensive Medication Adherence			Total No	X <sup>2</sup> Test
	Lowno. 25	Medium no. 23	High no. 12		
<b>Body mass index</b>					
➤ Ideal	8	13	5	26	2.9
➤ Overweight	10	6	4	20	
➤ Obese	7	4	3	14	
<b>Duration of illness</b>					
➤ ≤ 1 year	1	4	7	12	15.1**
➤ >1 year	24	19	5	48	
<b>Number of comorbid diseases</b>					
➤ Unknown	1	14	3	18	39.9**
➤ No other diseases	0	4	6	10	
➤ 1 - 2	9	2	1	12	
➤ 3 - 4	15	3	2	20	
<b>Physician prescribed medication for hypertension</b>					
➤ Yes	15	21	12	48	11.1**
➤ No	10	2	0	12	
<b>Number of hypertension medication</b>					
➤ 1	0	4	1	5	11.1*
➤ 2	1	6	3	10	
➤ > 2	24	13	8	45	
<b>Blood pressure controlled</b>					
➤ Yes	0	2	8	10	29.79**
➤ Sometimes	21	20	4	45	
➤ No	4	1	0	5	

Statistically insignificant at  $p > 0.05$  (\*) Statistically significant at  $p < 0.05$  (\*\*) Highly statistically significant  $p < 0.01$

**Table (8): Correlations between total level of hypertension self care activities' adherence among patients' pre counselling intervention and their demographic characteristics.**

Demographic Characteristics	Total Level of Hypertension Self Care Activities		Total No	X <sup>2</sup> Test
	Satisfactory No. 22	Unsatisfactory No. 38		
<b>Age:</b>				
➤ 40-	9	5	14	6.8*
➤ 50-	8	15	23	
➤ 60+	5	18	23	
<b>Gender:</b>				
➤ Male	5	27	32	13.1**
➤ Female	17	11	28	
<b>Education:</b>				
➤ No formal education	0	16	16	18.3**
➤ Primary	3	10	13	
➤ Secondary+ University	19	12	31	
<b>Employment status:</b>				
➤ Not employed	5	14	19	3.6
➤ Employed	7	10	17	
➤ Retired	7	13	20	
➤ Disability	3	1	4	
<b>Smoking:</b>				
➤ Yes	9	23	32	2.2*
➤ No	13	15	28	
<b>Income:</b>				
➤ Insufficient	9	28	37	6.3**
➤ Sufficient	13	10	23	
<b>Insurance status:</b>				
➤ Yes	14	19	33	1.1
➤ No	8	19	27	
<b>Residence</b>				
➤ Rural	18	14	32	11.4**
➤ Urban	24	4	28	
<b>Marital status</b>				
➤ Married	15	7	22	14.9**
➤ Single	7	31	38	
<b>Attending previous program regarding the hypertension</b>				
➤ No	22	38	60	NA

Statistically insignificant at  $p > 0.05$  (\*) Statistically significant at  $p < 0.05$  (\*\*) Highly statistically significant  $p < 0.01$

**Table (9): Correlations between total level of hypertension self-care activities adherence and clinical data Characteristics among patients' pre counselling intervention (N=60).**

Clinical Data Characteristics	Total Level of Hypertension Self Care Activities		Total No	X <sup>2</sup> Test
	Satisfactory no. 22	Unsatisfactory no. 38		
<b>Body mass index</b>				
➤ Ideal	15	11		8.7*
➤ Overweight	4	16	26	
➤ Obese	3	11	20	
<b>Duration of illness</b>				
➤ <1 year	10	2	12	14.1**
➤ >1 year	12	36	48	
<b>Number of comorbid diseases</b>				
➤ Unknown	10	8	18	14.3**
➤ No other diseases	7	3	10	
➤ 1-2	3	9	12	
➤ 3-4	2	18	20	
<b>Physician prescribed medication for hypertension</b>				
Yes	20	28	48	2.5
➤ No	2	10	12	
<b>Number of hypertension medication</b>				
➤ 1	2	1	5	4.4
➤ 2	6	4	10	
➤ > 2	14	33	45	
<b>Blood pressure controlled</b>				
➤ Yes	9	1	10	16.3**
➤ Sometimes	13	32	45	
➤ No	0	5	5	

Statistically insignificant at  $p > 0.05$  (\*) Statistically significant at  $p < 0.05$  (\*\*) Highly statistically significant  $p < 0.01$

#### 4. Discussion

Adherence or compliance, in the context of medical treatment, refers to how well a patient follows and sticks to the management plan developed with her/his health care provider, which may include pharmacologic agents as well as changes in lifestyle. Patients' non-adherence, or noncompliance, is common in chronic asymptomatic conditions such as high blood pressure. Non-compliance leads to poor blood pressure control and a deleterious outcome (stroke & coronary heart disease) (Klootwyk, & Sanoski, 2008). As well, non-compliance can cancel out the efforts that go into diagnosis, diagnostic work-up, and counseling of hypertensive patients. In fact, non-adherence costs the Egyptian society millions every year in ineffective therapeutic efforts. Hence, therapeutic compliance has been a topic of clinical concern since the 1970s due to the widespread nature of non-compliance with therapy. Therapeutic compliance not only includes patient compliance with medication but also with diet, exercise, or life style changes (Kokubo *et al.*, 2008).

Today patients' education through counseling is a new direction in rehabilitation, which involves the patient in therapeutic decision making for self-management. Nurses are in a position of being able to provide education, counsel and communicate to client who lack of knowledge and self care abilities to achieve the health goals and to improve and maintain adherence to the therapeutic regimen to keep healthy mind and body for better quality of life.

The present study was conducted to evaluate the effect of counseling on patients' adherence regarding anti hypertensive therapeutic regimen.

Regarding to demographic characteristics for patients in the study, the results revealed that, the mean age of the patients was  $56.41 \pm 8.09$  and more than half of them were male, smoker, from rural areas, had insufficient income, had health insurance and less than of them were single. While, two third had no formal education and one third retired. These findings were consistent with **The Central Agency for Public Mobilization and Statistics (1990)** which reported that, in Egypt and other developing countries there is a significant change in health profile. In both males and females, there was an increase in longevity; it increased in males from 51.6 to 62.8 years and in females from 53.8 to 66.4 years. Aging of the population will contribute to the increasing prevalence of old age diseases; namely hypertension, cardiovascular disease and diabetes. As well, **Ibrahim *et al.* (1995)** found that, *the* individuals were categorized into low education group, i.e., illiterate or just read and write and this constituted 64.7% and a high education group, i.e. finished high school, college or a university graduate were 35.3%.

As regards adoption of western life style, increased rates of obesity, cigarette smoking and other cardiovascular risk factors are definitely contributing factors for the hypertension.

Meanwhile, **Ashour *et al.* (1995)** found that, the lower levels of education were more common in hypertensive in comparison to normotensives (72% vs. 61%) and more in Egyptian women than men. Unemployment rate was higher in hypertensive than in normotensives, (30.2% vs. 12.9%). As regards the *residence*, 53.3% were living in urban areas while 26.7% lived in rural areas.

As regards the patients' clinical data characteristics as, body mass index, duration of illness, comorbid diseases, systolic and diastolic blood pressure measurements and medication history, the current study result showed that less than quarter of them were obese, the majority of them had duration of illness more than one year, while one third of them had 3-4 diseases associated with hypertension. However, three quarters stated that, sometimes the blood pressure was under control and for the majority of them the physician prescribed anti hypertension medication with medication for diabetes mellitus, cardiovascular problems and hypercholesterolemia.

These results were congruent with, **The Central Agency for Public Mobilization and Statistics (1990)** which found that, cardiovascular diseases associated with hypertension constitute now the main cause of mortality in Egyptians. In 1970, cardiovascular diseases were responsible for only 12.4% of deaths, infections and gastrointestinal for 32.8%. Two decades later, cardiovascular diseases caused 42.5% of deaths, while infections and gastrointestinal diseases were responsible for 14.1%. It is expected that this trend will increase and possibly, Egypt will be facing an epidemic in this year due to cardiovascular diseases. Meanwhile, **Gupta *et al.* (2007)** stated that, the obesity defined as body mass index (BMI) greater than  $30 \text{ Kg/m}^2$  was more common in hypertensive than normotensives (39.8% vs. 26.5%). Obesity was very common in hypertensive women present in 50.3%. Waist/Hip ratio: used as an index of body fat distribution was greater in hypertensive than normotensives and as expected more in men than women.

As regards systolic and diastolic blood pressure measurements, results of the current study showed that the mean scores of systolic and diastolic blood pressure decreased at 1 and 3 months after the program implementation. Meanwhile, it began to increase at 6 months after program intervention. These results it might be due to that the patients' adherence to the medication for long time was

difficult beside medications for the other comorbid diseases.

This results go on the same line with those of **Hroscikoski et al. (2006)**, who stated that, patients' knowledge about hypertension and its management, and counseling on a healthy lifestyle and self-care each have an independent effect on hypertensive patients' reported compliance with the recommended lifestyle behaviors. This result was also supported by **Ibrahim et al. (1995) and Li (2006)**, who found that, the systolic blood pressure frequency distribution, about 50% of Egyptians was SBP in the range 110-129 mmHg. In 2.7% SBP was above 180 mm Hg and in 3.3% it was less than 110 mmHg. However, the diastolic blood pressure frequency distribution, more than 60% of Egyptians DBP was in the range 70-89 mmHg. DBP was above 110 mmHg in 1.5% and less than 60 mmHg in 3.3%.

**The first hypothesis** of the present study was that the counseling program will have a positive effect on patients' knowledge toward the anti hypertensive therapeutic regimen. The results of this study supported the first hypothesis as the findings revealed that, there were highly statistically significant improvements in the patients' knowledge pre/post program phases' intervention.

This finding was supported by **Huang et al. (2004)**, who found that, the effect of beliefs and knowledge about hypertension and its management is concordant with the known theoretical model relating attitudes to changes in lifestyle behaviors, as well as the patient education about hypertension and lifestyle modification improved blood pressure control. Apparently, such patients can play a more active role in their treatment and therefore are more effective in controlling their condition. As well, **Chobanian (2009)** stated that, low counseling rates are attributed to a lack of time, knowledge, skills and training in lifestyle counseling, leading to patients' low self-confidence in performing this role.

The previous results were in the same line with **Armstrong (2010)** who mentioned that, the impact of enhanced health education programs about health knowledge and behavior (lifestyle modification) of patients with chronic conditions provided valuable results in improving patients' adherence to taking medication.

In the similar study **Kim et al. (2007)** clarify that, good health awareness and knowledge of high blood pressure, as well as of the medications being taken, have been shown to be associated with good adherence to medication regimes. They added that, it has been proven again, here, that improving patients' knowledge related to their illness or of the medications that they are taking, results in better adherence to their medications. Getting patients

involved in their treatments by imparting relevant knowledge often empowers patients to be more concerned about their health. This can be achieved through more patient counseling and health care professional patient interactions. A lot of improvement is possible in this area in primary health clinics by training and mobilizing the health caregivers.

**The second hypothesis** of the present study was that, the counseling program will have a positive effect on patients' adherence to the anti hypertensive medications. The result of this study supported the second hypothesis and there was a significant improvement in total adherence among the patients under study after implementation of the counseling program.

This finding goes on the same line with what was reported by **Nunes et al. (2009)** in their respective guideline and review which strongly advocate the adoption of an individualized consultation style that recognizes the importance of involving patients in treatment decisions as key to enabling clinicians to enhancing adherence. Meanwhile, **Haynes et al. (2008)** stated that, reviews of adherence interventions in general and in hypertension specifically have reported that much of the experimental work to date has generally taken a pragmatic one size fits all (for example, information, reminders and self monitoring) approach to enhancing adherence; most have been shown to be ineffective.

As well, **Braverman and Dedier (2009)** stated that, there is positive relationship between patient's levels of knowledge of treatment and better adherence. Additionally, **Burnier (2006) and Simpson et al. (2006)** identified that, adherence to treatments should not be a goal in itself, but should be seen as an instrument for increasing the health of the individual as well as society. In this respect, **Collins (2005)** found that, the nurse patient communication is often premised on contribution from the patient. The agenda of the nurses does not seem to be as 'routinized' as that of the doctors. Nurses also seem to address adherence and lifestyle factors to a higher extent than doctors do.

**The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) (2013)** stated that, beginning at the initial visit with a patient who has hypertension, the clinician should counsel and encourage the patient to make therapeutic lifestyle changes such as dietary changes, increased physical activity, tobacco avoidance, and weight control — and monitor the patient's progress. The report identify that, therapy begins with lifestyle modification. If the blood pressure goal is not

achieved thiazide-type diuretics should be used as initial therapy for most patients, either alone or in combination with one of the other class of medications that have also been shown in clinical trials to reduce one or more hypertensive complications.

**The third hypothesis** of the present study was that, the counseling program would have a positive effect on patients' adherence to the self care activities related to hypertension. The result of this study supported the third hypothesis and there was a significant improvement in total adherence among the patients under study after implementation of the counseling program.

As regards differences between patients mean scores regarding hypertension self care activities level effects pre/post counselling program phases' intervention. the majority of patients under study were adherent with self care activities 1 month post and gradually decreased at 3 and 6 months post program intervention. This result was supported by **Jin et al. (2008)**, who reported that, the therapeutic compliance not only includes patient compliance with medication but also with diet, exercise, or life style changes. They clarified that, in counselling, nursing actions are directed towards the goal of helping patients to accept the fact that they have hypertension. The nurse has to help the patients to understand that medications and lifestyle modifications can control but are generally unable to cure hypertension and to persuade them to use specific strategies to achieve the necessary lifestyle changes. When a patient is confronted with the need for lifestyle change, strategies are essential to handle a situation that could be experienced as demanding.

The **JNC 7 (2013)** recommends exercise, weight reduction, sodium restriction, moderation of alcohol intake, and a diet rich in fruits and vegetables and low in fat for all stages. Pharmacologic treatment options include > 50 agents, as well as combinations of agents, in 14 classes. In their study, **Heymann et al. (2011)** stated that, the hypertensive patients reported receiving counseling on the necessity of smoking cessation, correct diet, desired weight, and regular exercise in the treatment of blood pressure. Previous studies suggest that knowledge transferred from medical staff is an important factor in inducing patients to comply with lifestyle recommendations. In the previous study, **Hajjar and Kotchen (2003)** mentioned that, an integral and crucial element in controlling blood pressure is non-pharmaceutical treatment, which includes smoking cessation, weight reduction, proper diet, and regular physical activity. However, the level of patients' compliance with medical and non-medical treatment recommendations

is low. Consequently, blood pressure is controlled in only about a third of hypertensive patients.

**The fourth hypothesis** of the present study was that, the counseling program will have a positive effect on patients' beliefs toward the anti hypertensive therapeutic regimen. The result of this study supported the fourth hypothesis and there was a significant improvement in total adherence among the patients under study after implementation of the counseling program.

As regards the general health beliefs regarding hypertension therapeutic regimen pre/post counseling program phases' intervention in the current study, there were highly statistically significant improvements in post-test 1 month regarding most of the items. These results were supported by **Belal (2009)** who stated that patients' adherence to treatment often improves when they have positive beliefs about the efficacy of the treatment they take and trust that their treatment is working well to control their illness. However, believing that treatments are not important or harmful is a barrier to adherence. Patients' beliefs about medical management and drugs in particular are driven by their knowledge. **Pollock (2005)** found that, increasing awareness of possible differences in beliefs about medicines and the importance of beliefs for consultation could increase patient-centered consultation: e.g. seeing the patient as a person and establishing a therapeutic alliance. In this respect, this may also decrease the patients' misunderstandings and concerns about medicines. Questions about and discussing beliefs about medicines, thus increasing the involvement of the patient, are also likely to mean that the prescription of unnecessary and inappropriate drugs, the need for healthcare services and the costs of healthcare will decrease.

In a study carried out by **Hayrettin (2009)** found that 43.7% of patients believe that anti hypertensive drugs can be stopped once the blood pressure has stabilized. This shows how the lack of knowledge about treatment contributes to patient low adherence behavior. Surprisingly, **Abdulameer (2012)** highlighted that, although beliefs about medicines can affect adherence to medicines and the information in the consultation, not all healthcare professionals have been seen to recognize the importance of discussing patient beliefs during patient-healthcare communication. Interestingly, **Saeed (2011)** mentioned that, inclusion of the patient in the consultation and discussion of his/her thoughts are fundamental to patient-centered care, and have been seen to have positive effects on the health of the patient and adherence to medicines. Creating interventions based on beliefs about medicines is one new way to proceed to obtain improved adherence.



Considering the reasons and obstacles for non adherence with follow up visits, findings of the current study showed that, increased waiting time, outpatient clinic crowding, refusal to accept the chronic nature of the disease and lack of understanding of the importance of long-term continuing treatment were the common obstacles affecting patients' visits during follow up.

This result was congruent with **Neal *et al.* (2005) & Collins (2005)**, who stated that the patients might not be able to take time off work for treatment; as a result, their rate of compliance could be threatened. A shorter traveling time between residence and healthcare facilities could enhance patient's compliance. As well, **The JNC 7 (2013)**, emphasized that, all patients with diagnosed hypertension should be counseled and encouraged to make therapeutic lifestyle changes in order to lower their blood pressure. Many patients will also require anti hypertensive drug therapy. Once this is initiated, most patients should return for follow-up and adjustment of medications at monthly intervals or less until the blood pressure goal is reached. More frequent visits are necessary for patients with stage 2 hypertension or with complicating comorbid conditions. Comorbidities such as heart failure, diabetes, and the need for laboratory tests influence the frequency of visits. Other cardiovascular risk factors should be monitored and treated to their respective goals. After blood pressure is at goal and stable, follow-up visits can usually be at 3- to 6-month intervals, or more often if necessary.

Concerning the poor anti hypertension medication adherence reasons as stated by the patients under study pre/post counseling program intervention, there was a reduction in the reasons for poor adherence post intervention than before intervention with highly statistically significant differences. This might be due to that the patients became aware about the importance of the adherence to the anti hypertensive therapeutic regimen after the counseling program intervention.

This result was congruent with **Morisky *et al.* (2008)** who mentioned that the nurses and other health care professionals have an important role to increase patient compliance with therapeutic regimens through determining the factors affecting compliance of patients with hypertension toward therapeutic regimen, which is essential to reducing the level of non-compliance in general, quality outcomes while decreasing costs, resource consumption, and mortality rate. As well, **Jayasinghe, (2009)** identified that, nurse plays a pivotal role in improving the general well being of patients by patient education, support and evaluation

to increase patient involvement and self-reliance in the management of hypertension.

Meanwhile, **Krousel-Wood (2004)** stated that, among factors that affect patients' adherence are demographic characteristics, severity of disease, complexity of drug regime (number of drugs and daily doses prescribed), drug classes (due to tolerability and side effects to medication), patients' forgetfulness and lack of understanding on the nature of disease.

As regards the suggestions to improve the adherence as stated by the patients under study, there was significant improvements in post program intervention regarding items of suggestions as dosage simplification, educational interventions and information to patient and single-agent therapy. However, there were insignificant difference regarding to the improved tolerability profile of drugs and good physician and nurse patient interaction and improved drug efficacy. This result might be due to that there was no adequate time for the doctor or nurses to counsel the patients about their diseases and their treatment.

The result of the present study was inconsistent with **Jin *et al.* (2008)** who emphasized that, much of the earlier researches focused on identifying patient characteristics of noncomplaint individuals and the complexity of the medication regimen. In addition, BP control typically requires more than one antihypertensive medication and the frequency of dosing may vary. The complexity of the drug regimen affects compliance; compliance among hypertensive patients improves considerably when drugs are prescribed just once a day. In addition, many patients experience unpleasant side effects from their medication that may be unacceptable in a largely asymptomatic disease. This is often reported as one of the main reasons for non- or partial compliance. Meanwhile, **Sharaf (2010)** emphasized on, the outcome of 'patient-centered' communication between patients and health care providers is that it contributes to increase patients' understanding about their illnesses and adherence to treatments. This is based on the provided support from health care providers.

The current study result revealed that, there were positive correlations between patients' demographic characteristics and clinical data and low anti hypertensive therapeutic regimen adherence pre/post counseling program intervention. This result was consistent with **Hadi and Rostami-Gooran (2004) and Hayrettin (2009)** who stated that, the association between age and compliance is complex. In the present study, older patients were more compliant. Several studies have shown such an association, but conversely some researchers have

reported the opposite correlation. Meanwhile, **Balbay et al. (2005)** and **Al-Hamdan (2010)** reported that, some studies revealed that advancing age affected compliance among elderly people in the opposite direction. As well, **Alsolami et al. (2012)** mentioned that the risk factors associated with the development of hypertension are family history, advanced age, gender, a lack of physical activity, poor diet (especially salty food), overweight and obesity, and increased alcohol intake.

In similar study, **Choi-Kwon et al. (2005)** denoted that, the female patients were found by some researchers to have better compliance. As well, **Schoberberger (2002)** mentioned that, female patients were found to be one and a half times more compliant than male patients. The incidence of adherence was significantly lower in male patients. However, a literature review of several studies on the predictors of medication adherence in the elderly, and on the effects of age, sex, knowledge, attitudes, and comorbidities on medication adherence, revealed to be inconsistent.

**Yavuz et al. (2004)** and **Persell (2007)** stated that, several studies revealed that patients with higher educational level might have higher compliance, while other studies found no association. Intuitively, it may be expected that patients with higher educational level should have better knowledge about the disease and therapy and therefore be more compliant. However, **Senior et al. (2004)** found that even highly educated patients may not understand their conditions or believe in the benefits of being compliant to their medication regimen. As well, **Kaona et al. (2004)** and **Al-Nozha (2007)** studies showed that patients without formal educational qualifications had better compliance with cholesterol-lowering medication. Patients with lower educational level might have more trust in physicians' advise. From these results, it seems that educational level may not be a good predictor of therapeutic compliance.

Health literacy means patients are able to read, understand, remember medication instructions, and act on health information (**Vlasnik et al. 2005** and **Dowse & Ehlers 2005**). Patients with low health literacy were reported to be less compliant with their therapy. On the contrary, patients who can read and understand drug labels were found to be more likely to have good compliance. Thus, using written instructions and pictograms on medicine labels has proven to be effective in improving patient's compliance (**Hashmi, 2007**). In the same context, **Jin et al. (2008)** stated that, the cost is a crucial issue in patient's compliance especially for patients with chronic disease as the treatment period could be life-long. Healthcare expenditure could be a large portion

of living expenses for patients suffering from chronic disease. Cost and income are two interrelated factors. Healthcare cost should not be a big burden if the patient has a relatively high income or health insurance. However, **Mishra et al. (2005)** who found that patients who had no insurance cover or who had low income were more likely to be non-compliant to treatment. **Ahmad (2012)** identified that, however, even for patients with health insurance, health expenses could still be a problem. Healthcare personnel should be aware of patient's economic situation and help them use medication more cost-effectively.

The previous results were consistent with **Ibrahim et al. (1995)** who reported that, the systolic hypertension was present in 17.2% of the population, also more common in women than men. There was a sharp increase with aging reaching a plateau at age decade of 65-74 years. Diastolic hypertension was more common in men than in women in all age groups. Its prevalence increased progressively to reach a plateau between ages 45-65 years followed by a sharp decline that was more evident in women than in men.

The current study result revealed that, there were positive correlations between patients' demographic characteristics and clinical data and unsatisfactory level of self care activities adherence pre counseling program intervention. This result was consistent with **Zanni and Wick (2011)** who recommends lifestyle modifications, with good reason. Reducing weight by 10 kg (22 lb) reduces blood pressure by 5 to 20 mmHg; exercising 30 minutes daily is associated with a reduction of 4 to 9 mm Hg; and reducing sodium intake can affect pressure by 2 to 4 mmHg. Effecting changes in health behaviors involves helping the patient set realistic and achievable goals, suggesting small changes that elicit firm commitments. Patients may balk at 30 minutes of exercise but be willing to commit to 10 minutes a day. They may roll their eyes at a 10% weight reduction but commit to losing 5 lb. Sometimes, adding new behaviors (e.g, exercising) is easier than eliminating old habits (e.g, eating salty chips).

The **JNC 7 (2013)** reported that, the hypertension responds to both lifestyle changes and pharmacotherapy. Lifestyle changes include: exercise, weight reduction, sodium restriction, moderation of alcohol intake, and a diet rich in fruits and vegetables and low in fat for all stages. Pharmacologic treatment options include > 50 agents, as well as combinations of agents, in 14 classes. Generally, most patients require > 2 antihypertensive medications to achieve normal pressure.

Meanwhile, **Keenan and Rosendorf (2011)** stated that, health care providers and public health practitioners should work within the context of hypertension self-care to increase patient knowledge and improve self-efficacy for hypertension management. Providers need to consider the role of self-care adherence among patients with uncontrolled hypertension. Assessment of individuals' self-care activities in addition to medication adherence is an important first step. The patients may have low self-efficacy with respect to hypertension. They may require specific counseling and encouragement that hypertension is a manageable condition.

### Conclusion and Recommendations

From the study results, it was concluded that the patients with hypertension had many learning needs related to knowledge and self care deficiency. The study findings lead to accepting the research hypotheses that implementation of the counseling program will lead to improvement the patients' knowledge, self care practices, beliefs and adherence to the anti hypertensive medications received. Therefore, it is **recommended** to apply the counseling program to patients with hypertension in other settings, the nurses should be able to administer the program and educate the patients and their families about the therapeutic regimen including the medications and self care practices as low salt diet, physical activities, smoking, weight management and health beliefs, a simplified and comprehensive booklet is to be introduced to the patients at the out patients clinics and further studies on the factors affecting patients compliance with the recommended therapeutic regimen are to be carried out.

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