

Assessment of the Level of Compliance with Therapeutic Regimen among Patients with Hypertension

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Abstract

Background: Hypertension is an important condition among adults, affecting nearly one billion people worldwide. Treatment with appropriate medication is a key factor in the control of hypertension and reduction in the associated risk of complications. However, compliance with treatment is often sub-optimal, especially in developing countries. **Aim:** Assess the level of compliance with therapeutic regimen among patients with hypertension.

Design: Descriptive exploratory research design was used in this study.

Setting: This study was conducted at the medical department in EL-Sahel Educational Hospital. **Sample:** A purposive sample of (120 patients) with hypertension at the age of ≥ 18 years with a confirmed diagnosis of hypertension for six months.

Tools: tool(1) Structured Interview Questionnaire consists of two parts, part 1: Patients' Socio-demographic characteristics, and part 2: Patients' Medical Data. Tool(2) Patients' Compliance Assessment Questionnaire.

Results: Based on the findings of the present study. About half of the studied patients have a high level of compliance and less than one-third of them have a moderate level of compliance. Additionally, less than one-third of the studied patients have a low level of compliance.

Conclusion: The current study clarifies that there was a high significant positive correlation between all domains of patients' compliance at p-value < 0.01 .

Recommendations: Further studies are needed to assess compliance level in a larger community-based sample and to investigate the effectiveness of interventions expected to produce better compliance with therapeutic regimen among hypertensive patients.

Introduction :

Hypertension is a major risk factor for stroke and coronary heart disease and the most important risk factor for cerebrovascular diseases. A large percentage of the population, however, is unaware that they have hypertension, and those known to be hypertensive are often not adequately controlled. The first line of treatment for hypertension is preventive lifestyle changes and medication, and poor control is attributed to poor compliance with the treatment regimen (*Brouwers et al., 2019*).

Hypertension is a significant public health problem in many countries characterized by persistently raised pressure in the blood vessels (defined as systolic BP 140 with/ without diastolic BP 90 mm Hg). According to the Global Burden of Disease Study, increased blood pressure (BP) due to essential hypertension is the leading risk factor for death and disability. It is the cause of 50% of heart disease, stroke, and heart failure and 18% of overall deaths, and at least 40% of deaths in people with diabetes. Nearly all (90%) of adults will develop hypertension by the time they reach 80 years old (*Song et al., 2020*).

A therapeutic regimen consisting of nonpharmacological (lifestyle changes), pharmacological intervention, and patient education is effective in treating hypertension and reducing its complications. For hypertensive individuals, a healthy diet, physical activity, stress management, smoking cessation, regular monitoring, and taking medications can help reduce the risk of complications and improve overall health outcomes. Therefore, the implementation of a comprehensive therapeutic regimen may not only aid in the control of the disease but also improve the overall well-being of the affected population, and prevent economic burden to patients, families, and the healthcare system (*Pluta et al., 2020*).

Keywords:

Compliance,
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Patient compliance is defined as “the extent to which a person’s behavior in terms of taking medication, following diet, or executing lifestyle changes coincides with medical or health advice.” Compliance can be viewed as a patient’s behavior in terms of timeliness in seeking care, attendance at follow-up appointments, or observance of the physician’s advice. As compliance improves the outcome of hypertension, understanding its pattern is an important step in evaluating the effect of a hypertension treatment regimen (*Verulava & Mikiashvili, 2021*).

Nurses play an important role in helping hypertensive patients accept, understand, and perform therapeutic self-care to control high blood pressure. The key to accomplishing this is through the encouragement of active patient participation and mutual negotiation in the plan of care. In this way, the patient’s priorities and needs are considered rather than the nurse’s, thus increasing the likelihood of their adhering to the therapeutic regimen (*Khademian et al., 2020*).

Significance of the Study

Hypertension is a major healthcare challenge in modern life, as it relates to the increasing prevalence of stroke and cardiovascular morbidity and mortality. According to the European Society of Hypertension, the global prevalence of hypertension was estimated to be 1.13 billion in 2015, with a prevalence of over 150 million in central and eastern Europe. The overall prevalence of hypertension in adults is around 30-45%, with a global age-standardized prevalence of 24 and 20% in men and women, respectively, in 2015. This high prevalence of hypertension is consistent across the world, irrespective of income status, i.e. in lower, middle, and higher-income countries (*de Souza et al., 2022*).

Overall, the estimated prevalence of hypertension in Egypt was 26.3%. Hypertension prevalence increased progressively with age, from 7.8% in 25- to 34-year-olds to 56.6% in those 75 years or older. Hypertension was slightly more common in women than in men (26.9% versus 25.7%, respectively). Overall, 37.5% of hypertensive individuals were aware that they had high blood pressure, 23.9% were being treated with antihypertensive medications, and 8.0% were under control (systolic pressure <140 mm Hg and diastolic pressure <90 mm Hg). 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%) (*Sani et al., 2022*).

Aim of the Study

This study aimed to assess the level of compliance with therapeutic regimens among patients with hypertension.

Research question:

What is the level of compliance with the therapeutic regimen among patients with hypertension?

Subjects and Method:

A descriptive exploratory research design was utilized for the conduction of this study.

Study settings:

The study was conducted at the medical

department in EL- Sahel Educational Hospital, Cairo Governorate, Egypt.

Study Subjects:

A purposive sample of (120 patients) with hypertension at the age of ≥ 18 years both genders with a confirmed diagnosis of hypertension for six months, at the medical department, at EL- Sahel Educational Hospital.

Tools of data collection:

Two tools were utilized to collect data for this study.

Tool (I): Structured Interview Questionnaire.

This tool was adapted from (Nesnawy, 2015), and modified by the investigator to assess patients’ compliance regarding therapeutic regimen among hypertensive patients, It was divided into two parts.

Part one: Patients’ Socio-demographic characteristics:

This part included socio-demographic data such as (age, gender, level of education and place of residence.....ect).

Part Two: Patients’ Medical Data:

This part included medical data Such as (weight, height, BMI,....ect.)

Tool (II): Patients’ Compliance Assessment Questionnaire.

This tool was adapted from (Nesnawy, 2015), and modified by the investigator at the point (Compliance with nutritional regimen that lowers blood pressure) to assess patients’ compliance regarding therapeutic regimen among hypertensive patients, It included the following (Compliance with therapeutic and nutritional regimen, compliance with lifestyle that helps to lower blood pressure, perception of severity and risks of disease, perception of barriers, factors related to health care providers, and factors that motivate patients to adhering to therapeutic regimen).

Scoring system:

- ❖ Consider high level of compliance more than 80%.
- ❖ Consider moderate level of compliance (60-80%).
- ❖ Consider low level of compliance less than 60%.

Operational item:

The operational item included an elaboration of the phases of the study, namely the preparatory phase, content validity of the developed tool, pilot study, and fieldwork.

Preparatory Phase:

The investigator reviewed the literature using textbooks, scientific journals, and the internet to develop the data collection tool, and for acquiring in-depth knowledge about the subject. The questionnaire was developed in the Arabic language.

Validity and reliability:

The validity of the tools is whether or not the instrument measured what it was designed to measure it was done by seeking the opinions of a jury group consisting of five assistant professors of Medical-Surgical Nursing at the faculty of Nursing Helwan University who judged their clarity, comprehensiveness, accuracy, relevance and whether it elicited the type of information sought thus the tools were the face and content-validated. The tools were

modified and rephrased based on the jury's opinions. This phase took three weeks' duration.

Reliability is the consistency of a measure the degree to which an instrument measures the same way each time it's used under the same conditions with the same subject and validity is about the accuracy of a measure (Aithal and Aithal, 2020).

Pilot study:

It was carried out for one week to evaluate the reliability and applicability of the tools to find the possible obstacles that might be faced during data collection. 10% of the total sample (12 patients) was included and chosen randomly from the previously mentioned setting, then later included in the sample. There were no major modifications found after the pilot study. The pilot also served to assess the reliability of the scale by examining its internal consistency.

Field of work:

Field work included the following:

- An official approval letter clarifying the purpose of the present study was issued from the Dean of the Faculty of Nursing at Helwan University to the general director of the medical department, at EL-Sahel Educational Hospital, and Scientific Research Ethical Committee in the Faculty of Nursing as an approval to conduct this study.
- The investigator attended the previously mentioned setting two days/week (Saturday and Monday) during the morning and afternoon shifts. This study started from the beginning of December 2022, till the end of May 2023, covering six months for data collection.

- First, the investigator held the first meeting by interviewing each patient individually to introduce herself and briefly explain the study's nature and purpose. They were informed that participation in this study was voluntary and they had the right to withdraw at any time without giving any reason. Oral approval of patients to share in this study was achieved.
- Then, the self-administrated interview was distributed to each patient to assess the level of compliance regarding the therapeutic regimen. The questionnaire took about 20-30 minutes to be completed.

Statistical design:

Data were collected, coded, and entered into a personal computer (PC) IBM-compatible 2.6 GHz. They were analyzed using Statistical Package for Social Science (SPSS), under Windows version 24. The collected data were organized, revised, analyzed, and tabulated using number and percent distribution. Proper statistical tests were used to determine whether there were statistically significant differences between the variables of the study. The statistical tests used in this study were:

- 1- Chi-square test(X^2) for qualitative variables.
 - 2- Correlation coefficients (r) to find correlations between quantitative data.
- $P > 0.05$ there was a statistically insignificant difference
 - $P < 0.05$ there was a statistically significant difference
 - $P < 0.01$ there was a statistically highly significant difference.

RESULTS

Table (1): Frequency and percentage distribution of the studied patients according to their socio-demographic characteristics (n=120).

Demographic characteristics		
Age (years)		
0 ≤ 30		.3
0 ≤ 40	3	9.2
0 ≤ 50	8	1.7
0 ≤ 60	5	5.8
Mean ± SD 46.95 ± 7.43		
Gender		
Male	4	5.0
Female	6	5.0
Residence		
Urban	6	0.0
ural	4	0.0
Occupation		
Government employee	4	0.0
non-governmental employee	2	0.0
Free Business	4	0.0
does not work / Housewife	0	0.0
Monthly Income		
Enough	8	5.0
Not enough	02	5.0

Number of family		
1-4	1	7.5
5-8	9	2.5
Mean± SD 5.25±1.04		
Marital status		
Single		.8
Married	06	8.3
Widower		.7
Divorced		.2
Educational Level		
illiterate	3	0.8
Basic education	7	4.2
Secondary education	0	8.3
University education	0	6.7

Table (1) shows that the mean age of the studied patients is 46.95±7.43 years. About (58.3%) of the studied patients have a secondary level of education. Additionally, (55.0%) are female. While (80.0%) come from urban areas, and (50.0%) are not working, and are housewives. Concerning their monthly income, (85.0%) reported not having enough income. Furthermore, the mean number of family members for the studied patients is 5.25±1.04. While (88.3%) are married, and 58.3% of them have secondary education.

Table (2): Relationship between socio-demographic characteristics of studied patients and their total patients' compliance (n=120).

Items	Total patients' compliance						χ ²	P-value	
	High (n=57)		Moderate (n=32)		Low (n=31)				
	n	%	n	%	n	%			
Age	0 - 29		.3		.1			6.69	.009**
	30 - 39	1	6.8		.1		.2		
	40 - 49	9	0.9		8.8		.7		
	50 - 59		.0	4	5.0	7	7.1		
Gender	Male		0.5	1	5.6	7	7.1	7.197	.004**
	Female	1	9.5	1	4.4		2.9		
Residence	Urban	3	5.4	0	3.8	3	4.2	3.81	.03*
	Rural	4	4.6		.2		5.8		
Kind of work	Government	0	5.1		2.5			1.47	.000**
	non-governmental		.0		.4		6.1		
	Free business	1	6.8		.2		.2		
	Does not work / is a housewife	2	1.1	3	1.9	5	0.7		
Monthly income	Enough	3	2.8		2.5		.2	4.36	.021*
	Not enough	4	7.2	8	7.5	0	6.8		
Number of family	1-4		5.8		1.9		6.1	.936	.230
	5-7	8	4.2	5	8.1	6	3.9		
Marital status	Single		.5		.4		.5	.98	.064
	Married	2	1.2	6	1.3	8	0.3		
	Widower				.2				
	Divorced		.3		.1		.2		

Educational level	cannot read or write		.8		.2	0	2.3	2.50	.002**
	basic education		.0		2.5		9.0		
	intermediate/secondary education	5	1.4	3	1.9	2	8.7		
	university education	7	9.8		.4				

*Significant at p <0.05. **Highly significant at p <0.01. Not significant at p>0.05

Table (2) shows that a highly statistically significant relation was found between the studied patients total patients' compliance and their age, gender, kind of work, and educational level (p<0.01). While there was statistically significant relation between their residence and monthly income (p<0.05). However there was no statistically significant relation with their number of family and marital status (p>0.05).

Table (3): Correlation matrix between domains of patients' compliance.

	1	2	3	4	5	6	7	8	9
Compliance to taking antihypertensive drugs									
Commitment to eating foods that lower blood pressure	0.456 ≤0.01**								
Commitment to a lifestyle that helps lower blood pressure	0.499 ≤0.01**	0.601 ≤0.01**							
Realizing the seriousness of the disease	0.560 ≤0.01**	0.544 ≤0.01**	0.474 ≤0.01**						
Realizing the potential for risks	0.604 ≤0.01**	0.493 ≤0.01**	0.501 ≤0.01**	0.703 ≤0.01**					
Awareness of the benefits of compliance with treatment	0.572 ≤0.01**	0.556 ≤0.01**	0.772 ≤0.01**	0.650 ≤0.01**	0.600 ≤0.01**				
Awareness of obstacles	0.612 ≤0.01**	0.608 ≤0.01**	0.602 ≤0.01**	0.540 ≤0.01**	0.583 ≤0.01**	0.780 ≤0.01**			
Factors specific to healthcare providers	0.568 ≤0.01**	0.500 ≤0.01**	0.523 ≤0.01**	0.703 ≤0.01**	0.503 ≤0.01**	0.615 ≤0.01**	0.672 ≤0.01**		
Factors that maintain commitment	0.700 ≤0.01**	0.613 ≤0.01**	0.664 ≤0.01**	0.578 ≤0.01**	0.617 ≤0.01**	0.503 ≤0.01**	0.605 ≤0.01**	0.711 ≤0.01**	

Table (3) shows that there was high significant positive correlation between all domains of patients' compliance at p-value<0.01**.

Figure (1): Percentage distribution of the studied patients according to their total patients' compliance (n=120).

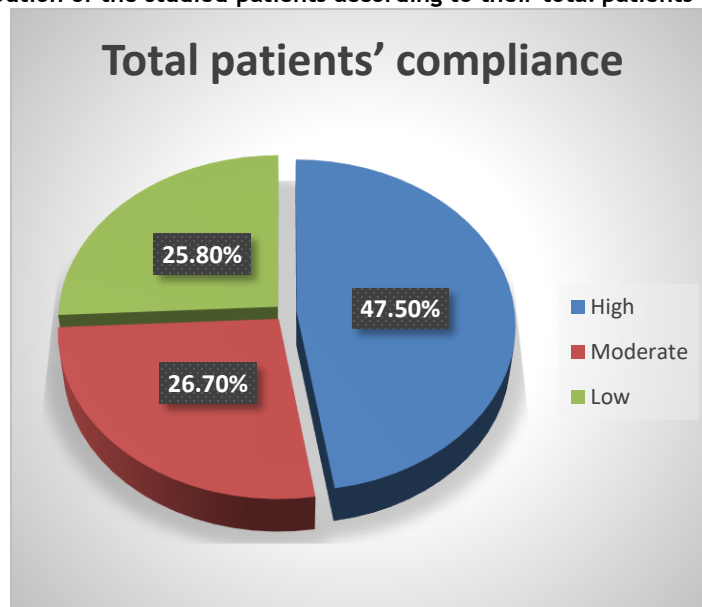


Figure (1) Indicates that 47.5% of the studied patients have a high level of compliance, while 26.7% of them have a moderate level of compliance. Additionally, 25.8% of them have a low level of compliance.

Discussion:

Concerning the age of the studied patients, the results of the present study revealed that around half of the studied patients were in the age group 50-59 years, with a mean age of 46.95 ± 7.43 . This result was in agreement with those of *Berhane & Worku, (2020)*, who conducted a study entitled "Adherence to antihypertensive treatment and associated factors in central Ethiopia" and mentioned that more than half of their studied were in the age group 50-64 years. These findings explained from the investigator's point of view may be due to increasing age, blood vessels lose their elasticity, and the chance of atherosclerosis increases which leads to high pressure and women experience hormonal changes, such as menopause.

Regarding the gender of the studied patients, the results of the present study showed that more than half of the studied patients were female. These findings explained by the investigator's point of view may be due to women being at higher risk of high blood pressure during pregnancy, which they often continue with. This result disagreed with that of *Nishigaki, et al., (2020)*, who conducted a study entitled "Physician and patient perspectives on hypertension management and factors associated with lifestyle modifications in Japan: results from an online survey" and mentioned that more than half of the studied patients were male.

Considering the residence of the studied patients, the results of the present study revealed that the majority of the studied patients come from urban areas. This result was agreed with that of *Pan et al., (2019)*, who conducted a study entitled "Determinants of hypertension treatment adherence among a Chinese population using the therapeutic adherence scale for hypertensive patients." And found the majority of patients come from urban areas. These findings explained from the investigator's point of view may be due to an unhealthy lifestyle, which contributes to high blood pressure.

Considering the occupation of the studied patients, the results of the present study revealed that half of the studied patients were not working and were housewives. This result was in accordance with that of *Roba et al., (2019)*, who conducted a study entitled "Prevalence of hypertension and associated factors in Dire Dawa City, Eastern Ethiopia: a community-based cross-sectional study" and found that about half of patients were not working and were housewives.

Considering the marital status of the studied patients, the results of the present study revealed that the majority of the studied patients were married. This result was agreed with that of *Chandler et al., (2019)*, who conducted a study entitled "Impact of a culturally tailored mHealth medication regimen self-management program upon blood pressure among hypertensive Hispanic adults" and found that about two third of the studied patients were married. These findings explained from the investigator's point of view may be due to an increase in responsibilities, life pressures, and lack of compliance with a healthy lifestyle.

As regarded the educational level of the studied patients, the results of the present study revealed that more than half of the studied patients had a secondary level of education. This result was agreed with those of *Alsaqabi & Rabbani, (2020)*, who conducted a study entitled "Medication adherence and its association with quality of life among hypertensive patients attending primary health care centers in Saudi Arabia". These findings explained from the investigator's point of view may be due to the lower the level of education; the more difficult it was to follow orders.

Regarding the medical data of the studied patients, the results of the present study revealed that about one-third of the studied patients had a family history of hypertension. This result was in disagreement with that of *Turan, et al., (2019)*, who conducted a study entitled "Effect of social support on the treatment adherence of hypertension patients" and found that more than two-thirds of patients had a family history of hypertension.

On the other hand, concerning the medical data of the studied patients, the results of the present study revealed that more than two-thirds of the studied patients had no family history of hypertension. This result was similar to those of *Ahmad & Sultan, (2023)*, who conducted a study entitled "Prevalence and associated factors of hypertension complications among hypertensive patients: a hospital-based study" and found that more than half of patients had no family history of hypertension.

Regarding to compliance with taking antihypertensive drugs, the results of the present study revealed that, more than half of the studied patients never forget to take medication for hypertension. This result was consistent with *Andualem et al., (2021)*, who conducted a study entitled "Adherence to antihypertensive medications among adult hypertensive patients attending chronic follow-up units of Dessie referral Hospital, northeastern Ethiopia: a cross-sectional study" and found that about two-thirds of the studied patients never missed their medication. These findings explained by the investigator's point of view may be due to they know that compliance with medication helps control blood pressure.

Regarding total patients' compliance, this result was congruent with those of *Espeche et al., (2020)*, who conducted a study entitled "Adherence to antihypertensive drug treatment in Argentina: A multicenter study" and revealed that around half of the studied patients have a high level of compliance, While less than one-third of them have a moderate level of compliance. Additionally, one-quarter of them have a low level of compliance. These findings explained from the investigator's point of view may be due to patients knowing that compliance with diet and medication helps them control blood pressure.

On the other hand, the results of the present study were incongruent with those of *Shi et al., (2019)*, who conducted a study entitled "Association between medication literacy and medication adherence among patients with hypertension" and revealed that the minority of the studied patients have a high level of compliance, while less than one-third of them have a moderate level of compliance. Additionally, two-thirds of them have a low level of compliance.

Regarding domains of patients' compliance, the results of the present study revealed that more than one-third of the studied patients realized the seriousness of the disease. This result was consistent with *Suhat et al.*, (2022), who conducted a study entitled "Relationship of health belief model with medication adherence and risk factor prevention in hypertension patients in Cimahi City, Indonesia" and found that more than two-thirds of the studied patients realized the seriousness of the disease.

Regarding the relationship between the demographic characteristics of studied patients and their total patients' compliance, the results of the present study revealed that there was a highly statistically significant relation was found between total patients' compliance and their age. This result was inconsistent with *GK, et al.*, (2019), who conducted a study entitled "Assessment of Adherence to Anti-hypertensive Treatment among Patients Attending a Urban Health Care Facility of a Medical College" and found that there was no statistically significant relation was found between the studied patients total patients' compliance and their age.

As regards the relation between the demographic characteristics of studied patients and total patients' compliance, the present study noticed that there was a highly statistically significant relation between total patients' compliance and their educational level. In addition, there was a statistically significant relation between total patients' compliance and their residence. This result was in agreement with that of *Hussein et al.*, (2020), who conducted a study entitled "Patient adherence to antihypertensive medications in upper Egypt: a cross-sectional study" and found that patients with higher education level and patients with a secondary level were highly statistically significant adherent than illiterate and also patients live in urban was statistically significant relation more adherent than those living in rural.

Regarding the relationship between the demographic characteristics of studied patients and their total patients' compliance, the results of the present study revealed that there was no statistically significant relation was found between total patients' compliance and their marital status. This result was consistent with *Girdhar et al.*, (2022), who conducted a study entitled "Epidemiological correlates of adherence to anti-hypertensive treatment in primary health care setting of Ludhiana, Punjab".

Regarding the correlation between domains of patients' compliance, the results of the present study revealed that there was a highly significant positive correlation between compliance to taking antihypertensive drugs and realizing the seriousness of the disease. This result was consistent with *Thirunavukkarasu et al.*, (2022), who conducted a study entitled "Medication Adherence among Hypertensive Patients Attending Different Primary Health Centers in Abha, Saudi Arabia: A Cross-Sectional Study".

Conclusion

Based on the findings of the present study. About half of the studied patients have a high level of compliance and less than one-third of them have a moderate level of compliance. Additionally, less than one-third of the studied patients have a low level of compliance.

Furthermore, there was a high significant positive correlation between all domains of patients' compliance at p -value <0.01 .

Recommendations

Based on the current study results, the following recommendations were suggested:

- Continuous educational programmes to enhance the patients' knowledge and practice regarding compliance with hypertension treatment.
- Health education media (such as TV, videotapes, brochures, etc.) should be available for the hypertensive patient to make use of their waiting time prior to receiving the necessary health service.
- Provide the necessary social support for patients who live alone.
- Enhance patient-physician relationship to improve compliance to therapeutic regimen.
- Encouraging patients to self-measurement of blood pressure and monitoring of compliance.

Further researches:

- Further studies are also needed to assess compliance level in a larger community-based sample and to investigate the effectiveness of interventions expected to produce better compliance with therapeutic regimen among hypertensive patients.
- Develop a booklet with simple language to simplify information about hypertension and its complications.
- Replication of the study on large subjects from different hospitals and in different geographical areas in Egypt for generalization of findings and to assess level of compliance for among hypertensive patients.

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