An-Najah National University

Faculty of Graduate Studies

TREATMENT SATISFACTION AND ATTITUDES TOWARD TAKING MEDICATIONS AMONG HYPERTENSIVE PATIENTS: A CROSS-SECTIONAL STUDY FROM PALESTINE

By

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Dedication

This thesis is dedicated to my beloved family, whose unwavering support and encouragement have been the foundation of my academic journey. To my parents, for their endless sacrifices and boundless love, which have always been my guiding light. To my siblings, for their constant motivation and understanding, especially during the challenging times.

I also dedicate this work to my dear friends, whose companionship and encouragement have been invaluable. Your belief in my abilities has been a source of strength and inspiration.

Finally, to my esteemed colleagues, whose collaboration and support have enriched this research. Your insights and camaraderie have made this journey both enlightening and enjoyable.

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Lastly, I would like to thank all the participants of my study for their time and cooperation, without which this research would not have been possible.

With sincere appreciation,

Kareman Yaseen

Declaration

I, the undersigned, declare that I submitted the thesis entitled:

TREATMENT SATISFACTION AND ATTITUDES TOWARD TAKING MEDICATIONS AMONG HYPERTENSIVE PATIENTS: A CROSS-SECTIONAL STUDY FROM PALESTINE

I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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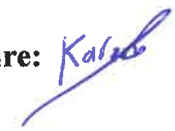
Signature: 

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TREATMENT SATISFACTION AND ATTITUDES TOWARD TAKING MEDICATIONS AMONG HYPERTENSIVE PATIENTS: A CROSS-SECTIONAL STUDY FROM PALESTINE

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Abstract

Background: Millions of patients are living with hypertension worldwide. This study aimed to assess the attitudes of hypertensive patients toward taking antihypertensive medications and their satisfaction with the treatment.

Methods: This research employed a cross-sectional design with a questionnaire as the instrument for data collection. This study was conducted in the primary healthcare centers of the Ministry of Health in Nablus, West Bank, Palestine. In addition to the demographic and clinical variables, the questionnaire also included the Arabic translated and culturally adapted Drug Attitude Inventory (DAI-10) and the Arabic version of the Treatment Satisfaction Questionnaire for Medication (TSQM).

Results: In this study, 356 patients with hypertension were included. More than half of the patients (57.6%, n = 205) were on amlodipine. Additionally, valsartan was used by 117 (32.9%) of the patients. The vast majority of the patients (95.2%) believed that they benefited from their antihypertensive drugs, and in their opinion, the benefits of their antihypertensive drugs outweighed the drawbacks. The vast majority of the patients (95.2 %) believed that they benefited from their antihypertensive drugs, and in their opinion, the benefits of their antihypertensive drugs outweighed the drawbacks. The Drug Attitude Inventory (DAI-10) measures the attitudes and adherence of hypertensive patients toward their antihypertensive medications via 10 statements. The DAI-10 scores were affected by the time since diagnosis ($p = 0.004$), presence of a documented food or drug allergy ($p < 0.001$), body mass index ($p = 0.004$), perceived effectiveness of the antihypertensive medications ($p = 0.010$), side effects ($p = 0.001$), convenience ($p = 0.040$), and global satisfaction scores ($p < 0.001$). The perceived effectiveness of

antihypertensive medications was affected by side effect scores ($p = 0.002$), convenience scores ($p < 0.001$), and global satisfaction scores ($p < 0.001$). The global satisfaction scores were affected by the time since diagnosis ($p = 0.008$), DAI-10 score ($p < 0.001$), perceived effectiveness of antihypertensive medications ($p < 0.001$), and side effects ($p < 0.001$).

Conclusions: The findings of this study revealed positive attitudes and high levels of satisfaction with antihypertensive medications among patients, especially with respect to the perceived effectiveness and convenience of antihypertensive medications. The time elapsed since diagnosis with hypertension, the presence of documented allergies, and high BMI are important factors that can predict negative attitudes and low satisfaction with treatment. Healthcare providers and decision makers should consider measures to improve, maintain, and support positive attitudes and satisfaction with treatment among hypertensive patients.

Keywords: Attitudes, Satisfaction, Hypertension, Antihypertensive Medications, Treatment, Cardiovascular Disease, Primary Healthcare.

Chapter One

Introduction and Theoretical Background

Hypertension, or raised blood pressure, is a clinical condition defined by persistently high pressure within the blood vessels. According to reports, (25%) of men and (20%) of women have elevated blood pressure (1). It is responsible for almost (45%) of the worldwide morbidity and death associated with cardiovascular disease (2).

Approximately 1 billion patients are affected by hypertension worldwide. Hypertension is the major risk factor for cardiovascular and renal disease and a major contributor to death (2).

It has been estimated that more than (20%) of individuals globally have high blood pressure, and among them, more than half have uncontrolled blood pressure (3). Hypertension is the cause of approximately (50%) of all fatalities related to stroke and heart disease. Additionally, hypertension-related complications result in 9.4 million deaths annually globally (4).

Hypertension is often referred to as a condition that causes few or minimal symptoms and is sometimes called the “silent killer” (5). Despite the existence of current guidelines and accessible medications, achieving an ideal reduction in blood pressure is still a challenge (6, 7). In previous studies, the proportion of patients who adhered to the prescribed antihypertensive drugs ranged between (60%) and (26%) (8). Moreover, nonadherence significantly affects clinical outcomes and leads to insufficient blood pressure control (8).

Various factors can influence patients’ adherence to antihypertensive therapy, such as sociodemographic and cognitive variables, the physician–patient relationship, health system features, the number of medicines used, comorbidities and the general profile of patient health (9). In addition, perceptions of drug use and treatment satisfaction also impact medication adherence (10). One way to examine this aspect is by considering the patient's viewpoint via the use of self-assessment questionnaires that measure their attitudes toward taking medications, their contentment with the therapy, and their perceived quality of life in relation to their health (8, 11).

It is generally accepted that an optimistic outlook on the administration of medicines and contentment with therapy are instrumental in increasing adherence levels. Therefore, it is important to evaluate the mindset of hypertension patients who have been given antihypertensive drugs.

1.1 A brief review of the relevant literature

1.1.1 Hypertension

Hypertension is the main adjustable factor that increases the risk of cardiovascular disease and death from any cause on a global scale (12). In 2010, over 1.38 billion individuals, or approximately (30%) of the worldwide adult population, were diagnosed with hypertension (12, 13). Hypertension is defined as a systolic blood pressure above 140 mmHg and/or a diastolic blood pressure surpassing 90 mmHg (6, 7). The worldwide prevalence and incidence rates of hypertension are becoming higher because of aging population and higher levels of exposure to potentially modifiable lifestyle risk factors such as junk food (specifically, consuming excessive salt and low consumption of potassium) and a lack of active lifestyles, including the performance of physical exercise (14). Nevertheless, the incidence of hypertension varies throughout different regions of the globe. Over the last twenty years, high-income countries have experienced a small decline in the prevalence of hypertension, whereas poor and middle-income countries have experienced significant increases (13). The variations in the prevalence of hypertension trends indicate that in poor countries, clinicians may encounter a significant increase in the proportions of people who are affected by hypertension and associated cardiovascular diseases. This increase may occur with a considerable burden of infectious illnesses in certain circumstances.

An analysis of data from more than 800 studies conducted in more than 150 countries involving about 9 million people revealed that in 2015, the average systolic blood pressure was 127.0 mmHg for males and 122.3 mmHg for females (15). The average diastolic blood pressure for men was 78.7 mmHg, while women had a diastolic blood pressure of 76.7 mmHg after age was taken into account. Both males and females from Eastern and Central Europe, South Asia, and Sub-Saharan Africa and presented elevated average systolic and diastolic blood pressures. On the other hand, affluent Western and Asia–Pacific areas were found to have lower average blood pressures. Regional disparities in hypertension may be due to certain social and environmental determinants,

include insufficient access to healthcare facilities, the availability of hypertension medications, and disparities in risk factors such as obesity, drunkenness, poor dietary choices, and insufficient physical activity (15, 16). Zhou et al. (2017) revealed that average blood pressure has either remained the same or significantly declined globally during the last 4 decades (16). After adjustment for age, the estimated worldwide average systolic blood pressure in males was quite constant from 1975 (126.6 mmHg) to 2015 (127.0 mmHg). Nonetheless, the blood pressure of females slightly decreased from 123.9 mmHg to 122.3 mmHg over this period. For both men and women, the trends in estimated worldwide mean age-standardized diastolic blood pressure were similar, with no change for men and a slight reduction for women. However, during the same period, there was more within-region variation in estimated mean blood pressure levels than between-region variation. In summary, hypertensive income states have fallen remarkably, whereas low-income countries have experienced an increase in income. Over that period, there were notable declines in high-income countries, but conversely, low- and middle-income nations experienced increases in hypertension rates, which are related to socioeconomic status changes, among other factors that have been attributed to the obesity epidemic in these areas. High-income Western Countries, Eastern Europe/Central Asia, Asia Pacific, Latin America/Caribbean, North Africa/Middle East, and Sub-Saharan Africa. Notably, there are different variations over time across regions in terms of average systolic blood pressure rates, which can be clearly observed in these diagrams, whereas the most significant decline occurred in people living within high-income western regions and eastern Europe/central Asia; others observed increasing trends, especially among those from Latin America/Caribbean or sub-Saharan Africa; either the North Africa/Middle East or Asia Pacific underwent small changes during this analysis period, hence showing a similar picture.” The data indicate that the most significant reduction in systolic blood pressure occurred in the high-income Asia–Pacific region, where men’s value decreased by 2.4 mm Hg per decade and women's value decreased by 3.2 mm Hg per decade. Moreover, in the high-income western region, men experienced a decline of 1.5 mm Hg per decade, whereas women experienced a decrease of 1.8 mm Hg per decade in diastolic blood pressure. Female patients from Central and Eastern Europe, Latin America and the Caribbean, the Middle East and North Africa, and Central Asia exhibited a reduction in both systolic and diastolic blood pressure values. Moreover, the men from these

countries did not experience any variation in this parameter. The average SBP (systolic blood pressure) and DBP (diastolic blood pressure) of people from Eastern and Southern Asia, Southeast Asia, South Pacific islands and black Africa, whose sex is male or female, have increased (16).

The disparity in the mean systolic and diastolic blood pressure measurements across different regions has led to variabilities in the prevalence rates of hypertension (15, 16). The prevention, diagnosis and treatment of high blood pressure have certainly influenced the reduction in blood pressure levels in these regions. Conversely, a lack of health care resources coupled with a graying population as well as urbanization, which leads to decreased physical activity and poor diet, is a probable cause of increased blood pressure among low- and middle-income countries. Both men and women have better awareness rates, treatment levels, and hypertension control in both high-income countries and low-middle-income countries. The differences in these factors play a large role in explaining why there may be greater reductions in blood pressure reported among women than among males in some areas.

1.1.2 Burden of hypertension across the globe

A prospective study included 153996 individuals aged 35–70 years from 628 urban and rural areas in 17 countries with different geographical and economic characteristics (17). The recruitment of participants took place from 2003 to 2009. This research included 142,042 people who had baseline blood pressure data, offering a unique chance to examine the incidence of hypertension across rural and urban populations in various parts of the globe. Research from PURE revealed that (40.8%) (95% CI 40.5-41.0%) of the people who took part had been diagnosed with hypertension, with a greater percentage of males (41.4%) than females (37.7%). Compared with their urban counterparts, rural dwellers in high-income and middle-income countries were more likely to suffer from hypertension. However, the opposite was true for low-income countries (17).

In 2017, hypertension in adults was redefined to include a systolic blood pressure of ≥ 130 mmHg and/or a diastolic blood pressure of ≥ 80 mmHg (18, 19). The decision to make this change was informed by several extensive, forward-looking studies that revealed a notable rise in the risk of cardiovascular disease as blood pressure increased,

even at levels as low as 115 mmHg for SBP. Additionally, the outcomes of randomized clinical trials supported this change (20). These trials demonstrated that aggressively lowering blood pressure (with a target systolic blood pressure below 120 mmHg) resulted in a greater reduction in both cardiovascular disease and overall mortality than standard lowering blood pressure (with a target systolic blood pressure above 140 mmHg). Upon the implementation of the new definition, the prevalence of hypertension among the general population in the United States increased from (32.0%) (according to conventional standards) to (45.4%). The prevalence in the overall Chinese population has substantially increased, increasing from (23.2%) to (46.4%). These results indicate that if the revised criteria were implemented globally, the disparity in the prevalence of hypertension between low-income and middle-income states/countries and high-income countries would be much greater than what has been previously reported (15). A better adherence to the revised recommendations would require a greater percentage of individuals receiving treatment with antihypertensive drugs. However, this approach could save approximately 610,000 cardiovascular disease incidents and 334,000 fatalities annually in the United States alone.

1.1.3 Hypertension, heart disease, renal disease, and death

Research has shown a robust, autonomous, and consistent correlation between blood pressure and the likelihood of cardiovascular disease, without any indication of a specific blood pressure threshold (17, 20-22). For example, the Prospective Studies Collaboration analyzed the connection between blood pressure and mortality related to particular causes in almost 1 million persons aged 40 to 89 years who had no prior history of cardiovascular disease at the start of the study (20, 22). This analysis was based on data from 61 observational studies conducted in the past. Over a period of 12.7 million person-years, there were approximately 56000 fatalities due to cardiovascular disease (12000 from stroke, 34000 from ischemic heart disease, and 10000 from other cardiovascular diseases), as well as 66000 deaths from other causes. Meta-analyses that accounted for regression dilution revealed that the relative change in the risk of cardiovascular disease mortality, linked to a specific absolute difference in average blood pressure for each ten-year age group, remained consistent even for increases in blood pressure starting from values as low as 115 mmHg systolic and 75 mmHg diastolic (22). Among individuals between the ages of 40 and 69 years, a variation of 20

mmHg in normal systolic blood pressure or 10 mmHg in usual diastolic blood pressure was linked to a more than twofold-fold greater likelihood of stroke-related mortality and a twofold-fold greater likelihood of death due to ischemic heart disease and other cardiovascular diseases. The relationship between the absolute difference in ordinary blood pressure and cardiovascular disease mortality differed between persons aged 80-89 years and adults aged 40-49 years. Specifically, the proportionate disparity in cardiovascular disease mortality linked to a specific absolute difference in blood pressure was almost fifty percent lower in the older age cohort compared to the younger cohort. Nonetheless, the annual absolute risk disparities were more pronounced in older individuals.

Hypertension is a risk factor for chronic kidney disease and renal failure; this has been demonstrated by several extensive prospective cohort studies (23, 24). Elevated blood pressure levels greater than 120 mmHg were consistently and gradually related to increased risk. A study conducted on 332544 males aged 35 to 57 years, initially free of end-stage renal disease, exhibited a significant and independent linear correlation between both systolic and diastolic blood pressure and the incidence of end-stage renal disease over an average follow-up duration of 16 years (25). The relative risk of end-stage renal disease in males with hypertension, characterized by a systolic blood pressure above 210 mmHg or a diastolic blood pressure surpassing 120 mmHg, was 22.1 ($P < 0.001$) higher than that for normotensive men with a systolic BP less than 120 mmHg and diastolic blood pressure less than 80 mmHg. An analogous correlation between blood pressure and the risk of end-stage renal disease was shown in a group of 158,365 Chinese individuals, both male and female, who were at least 40 years old. Furthermore, blood pressure had a notable and separate correlation with advancement to end-stage renal disease in a group of 3,708 individuals with chronic kidney disease included in the U.S. Chronic Renal Insufficiency Cohort Study. Research has revealed that patients with systolic blood pressure levels between 130–139 mmHg have a multivariate-adjusted relative risk of end-stage renal disease that is 2.37 times greater (95% CI 1.48–3.80) than that of patients with systolic blood pressure levels below 120 mmHg. Similarly, patients with systolic blood pressure (BP) levels above 140 mmHg had a relative risk of end-stage renal disease that was 3.37 times greater (95% CI 2.26–5.03) than that of patients with systolic blood pressure below 120 mmHg (23-25).

1.1.4 Risk factors associated with hypertension

Both diastolic and systolic blood pressures, as well as the incidence of hypertension, tend to increase with increasing age, regardless of sex. Younger males tend to have greater blood pressure than younger females do; however, the rate at which blood pressure increases every decade is higher in women than in men (26). Compared with their male counterparts, women aged 60 years have higher average blood pressures and more cases of hypertension. The probability of developing hypertension depends on race and ethnicity. Another study that was conducted between 2015-2016, which involved 4,821 American adults who were above twenty years of age, revealed that non-Hispanic Blacks (57.3%) had a significantly higher frequency of hypertension than non-Hispanic Whites (43.8%) and Hispanic Americans (44.7%) (26). There is a lack of evidence to support the notion that hereditary variables are responsible for racial and ethnic inequalities in the risk of hypertension. The primary variables that are expected to contribute to racial and ethnic disparities in average blood pressure and the prevalence of hypertension include sociodemographic, environmental, and behavioral factors. Furthermore, several variables may be changed or adjusted, such as high salt intake, insufficient potassium consumption, obesity, alcohol consumption, sedentary lifestyle, and an unhealthy diet, all of which are linked to a greater likelihood of developing hypertension (15, 27).

1.1.5 The economic burden of hypertension

Hypertension is linked to a significant economic cost. The costs encompass direct health-care expenses related to the management of high blood pressure, such as laboratory tests, medications, and clinic visits (28). Additionally, it includes costs associated with hospitalizations for complications arising from high blood pressure, as well as indirect costs resulting from lost productivity owing to premature death and disability caused by cardiovascular and kidney diseases related to hypertension. In 2001, the worldwide economic repercussions of hypertension were anticipated to exceed US$370 billion., which accounted for almost (10%) of the total global health-care spending (28). Nevertheless, significant disparities in health-care expenses across different regions were noted. For example, hypertension was responsible for (22.6%) of total healthcare costs in Eastern Europe and Central Asia, but it accounted for only (7.2%) of healthcare costs in East Asia and the Pacific. To the best of our knowledge,

there are no additional current assessments of the worldwide economic impact of hypertension.

1.1.6 Attitudes of patients toward hypertension and hypertensive medications

In Nepal, Shrestha et al. (2021) conducted a study with the objective of assessing the attitudes and behaviors of patients using antihypertensive medications toward hypertension at a tertiary care teaching hospital located in the western region of Nepal (29). The study was conducted in a cross-sectional design in a hospital setting. A total of 136 hypertensive patients who were taking medication and were aged 30 years or older were included. The patients were sampled from the outpatient department, medical floor, and geriatric ward via a nonprobability convenient sampling design. Data collection was conducted via interviews via semistructured questionnaires. The majority of the patients were male, accounting for (56.6%) of the total. The average age, shown as the mean ± standard deviation, was 56.74 ± 12.58 years. The majority of individuals identified as Hindu (69.9%), belonging to the upper caste (29.4%), lacking literacy (22.1%), and engaged in homemaking (27.2%). A total of (50.7%) of the patients had good attitudes, whereas (52.2%) demonstrated satisfactory self-care practices. The factors of educational level and dietary pattern and attitudes were shown to be significantly correlated, but no associations were detected between sociodemographic characteristics and self-care behavior. There was a significant correlation between attitudes and self-care habits ($p = 0.002$). The study revealed that (50%) of the sample patients had a positive attitude, whereas over (50%) demonstrated satisfactory self-care practices. Therefore, it is essential to prioritize educational treatments and awareness programs that specifically target nutritional components to enhance the attitudes and behaviors of all patient groups (29).

Craig et al. (2021) conducted a study to investigate the reasons behind the ongoing problem of poor medication adherence rates (30). This study analyzed the effects of implicit and explicit attitudes as well as established risk factors on objective and subjective antihypertensive medication adherence. Implicit and explicit beliefs were assessed by examining the difference between the scores of participants in the single-category IAT on computers, whereas the Necessity and Concerns subscales of the BQ-MED were applied in studying the same aspect. The prescription refill percentage of days covered (PDC) was calculated to assess adherence, whereas the 4-item Krousel-

Wood Medication Adherence Scale (K-Wood-MAS-4) was used for self-reporting purposes. Low adherence was defined as a mean PDC of < 0.8 or score ≥ 1 on the KWAM-4. The analysis involved hierarchical logistic and linear regression models that accounted for traditional risk variables, including socioeconomic determinants of health, as well as implicit and explicit attitudes in a programmed and stepwise manner. A total of 85 individuals who lived in the community and had insurance were included in the study. Among them, (44.7%) were female, (20.0%) were black, and the average age was 62.3 years. A total of (43.5%) had a low PDC, and (31.8%) had poor adherence according to the K-Wood-MAS-4 scale. The mean (standard deviation) scores for explicit and implicit attitudes were 7.188 (5.683) and 0.035 (0.334), respectively. A lower PDC was found to be related to more favorable explicit attitudes (adjusted odds ratio [aOR], 0.87; (95%) confidence interval [CI], 0.78–0.98; P=0.022) and implicit attitudes (aOR, 0.12; (95%) CI, 0.02–0.80; P=0.029). These attitudes explained an extra (8.6%) (P=0.016) and (6.5%) (P=0.029) of the variance in low PDC, respectively. There was a negative association between lower mean K-Wood-MAS-4 scores (indicating greater adherence) and more positive explicit attitudes. The adjusted β value was -0.04, with a (95%) confidence interval of -0.07 to -0.01 and a p value of 0.026. Explicit attitudes explained an extra (5.6%) of the variation in the K-Wood-MAS-4 scores, with a p value of 0.023. Implicit and explicit attitudes were shown to have a substantial effect on medication adherence, even after accounting for conventional risk factors and socioeconomic determinants of health. These attitudes should be further investigated as possible variables that influence adherence behavior.

Perret-Guillaume et al. (2011) conducted a study to examine the inclination of older patients to embrace antihypertensive treatment and their preferences for information and involvement in medical decision-making (31). Following the provision of standardized information regarding hypertension and its treatment, a total of 120 patients (with an average age of 83.8 ± 7.4 years) were surveyed regarding their willingness to undergo hypertension treatment in 15 hypothetical situations. These scenarios vary in terms of outcomes (such as myocardial infarction, heart failure, stroke, and death), absolute risks and risk reductions, and the potential for side effects. Between (50%) and (60%) of patients agreed to undergo therapy in all situations, whereas only (4%) to (7%) explicitly declined it, and (30%) to (40%) were uncertain. The Autonomy Preference Index (API) revealed a paradoxical finding: patients generally had a low inclination

toward participating in medical choices, as shown by a mean score of 58.9 ± 13.9 (mean ± standard deviation) out of 100. However, they expressed a strong need to acquire comprehensive medical information, as indicated by a mean score of 69.6 ± 17.2. Research suggests that a significant number of patients choose to entrust the ultimate decision-making authority to their physician, although the majority want to obtain comprehensive information. While the responsibility for deciding on treatment lies with the physician, patients may not necessarily fully comprehend or comply with antihypertensive medication despite initially accepting it. Full comprehension and willingness to undergo therapy require careful consideration of patients' wishes and many reiterations during subsequent consultations (31).

A qualitative study was conducted to obtain a better understanding of the experiences related to the treatment of high blood pressure using antihypertensive medications (32). The study was conducted via interviews. A healthcare facility located in the western region of Sweden that provides essential medical services. Procedure. Malterud's systematic text condensation method was used to conduct qualitative interviews and analysis. Topics. Ten individuals, including six men and four women, participated in pharmaceutical therapy for high blood pressure. Primary outcome measure. Observations about the efficacy and effects of pharmacological therapy for hypertension. The results revealed a sequential progression beginning with resistance to pharmacological therapy associated with the absence of regulation, adverse consequences, and an undesirable consciousness of compromised well-being. The initial negative emotions subsequently transformed into a favorable inclination toward making lifestyle adjustments due to concerns about cardiovascular disease. Consequently, the perception of medications shifted to seeing them as a means of rescue and a commonplace solution, thus fostering faith in healthcare. Although there was early reluctance to undergo therapy, the perception of antihypertensive medication gradually improved with time. Adherence to treatment relies on having confidence in the health care system. General practitioners play a crucial role in this matter.

Another qualitative study was conducted to gain insight into the perspectives and encounters of hypertensive individuals with respect to hypertension and the use of antihypertensive drugs (33). This qualitative analysis used open-ended questions from a survey to obtain insights from hypertension patients who were receiving therapy. The

aim was to understand their viewpoint on their condition and the effectiveness of their treatment. A total of 219 individuals aged 30 years or older who were taking antihypertensive medication were included in the study. These patients sought consultation at 25 primary health care clinics in Stockholm, Sweden, in 2016. The research used a thematic analysis method that included both inductive and deductive approaches. From the data, the researchers identified 21 codes. The analyses indicated that a significant number of hypertensive patients possess a restricted understanding of their condition. They also harbor concerns regarding the potential adverse effects of medication and encounter several challenges in receiving primary healthcare. These challenges, such as brief doctor appointments, prescription without proper communication, and the need for improvement in tailoring therapy and adopting a patient-centered approach, may have a detrimental effect on treatment adherence. A significant number of hypertensive patients possess a restricted comprehension of their condition and experience apprehension about the potential negative consequences of their antihypertensive drugs. There is also potential for improvement in the management of patients in basic health care. To encourage the accomplishment of a better blood pressure goal, interventions should prioritize these specific challenges (33).

Another study was conducted to examine the perceived issues and attitudes related to the management of hypertension in primary health care settings (34). A cross-sectional survey was conducted over the course of one week to study 2219 hypertension patients. These individuals were selected by general practitioners and were located in 26 health centers. Among the total number of patients, 1782 individuals (80%) completed and returned two questionnaires and took part in a health checkup. The research included a total of 1561 individuals who were receiving medical therapy for hypertension and 220 patients who were not currently receiving medical treatment. The surveys included 82 inquiries pertaining to various facets of hypertension care and therapy, which were further explored via factor analysis. On the basis of rigorous reliability and internal validity evaluations, a total of 14 issue indicators were established for the medical treatment of hypertension. The predominant issue reported was a deficiency of desire to pursue the necessary actions for managing hypertension, with a majority of (72%) of participants expressing this concern. A significant proportion of patients (66%) had challenges accepting their hypertension diagnosis. A prevalent occurrence (63%) of a negligent approach toward hypertension was observed. A total of (56%) of the patients

experienced a dearth of information. Approximately one-third of individuals had feelings of hopelessness regarding their hypertension, reported negative impacts of hypertension therapy on their sexual functions, and expressed a lack of support from healthcare professionals. The difficulties of payment and adjustment of dose recommendations were the least prevalent. The number of issues found per participant ranged from zero to 14, with an average of 4.9 ± 2.6 (standard deviation). Hypertensive patients in primary health care often encounter perceived challenges related to hypertension, as well as unfavorable attitudes and experiences (34).

In Sri Lanka, a study was conducted to investigate the knowledge, attitudes, and behavior related to hypertension in adult patients with high blood pressure in a specialized hospital in Sri Lanka (35). In this study, the knowledge, attitudes, and practices of hypertension patients regarding their antihypertensive drugs were investigated. The study focused on patients visiting the hypertensive clinic. The research included a total of 371 individuals with hypertension, including 253 (68.2%) females and 118 (31.8%) men. Among all the participants, 12 individuals (3.2% of the total) were women who had never had any formal education. Approximately (47.7%) of them had not achieved GCE (ordinary level) education. A majority of the study population (77%) had knowledge of the problems associated with hypertension since they were briefed by a member of the healthcare team. Approximately (74%) of individuals adhered to their whole prescription regimen. Nearly all (95%) of the patients had monitored their blood pressure (BP) over the last 12 months, and a similar number had scheduled medical appointments for BP examinations every 1–3 months. The patients in this study showed a high level of understanding of the need for frequent follow-up appointments and were also well informed about the potential risks associated with hypertension. Approximately (75%) of the patients exhibited optimal adherence to the prescribed medication. Forgetfulness was identified as the primary reason for inadequate adherence to medication (35).

Another study investigated awareness and knowledge of hypertension and its related risk factors among individuals diagnosed with hypertension. A total of one hundred and ten individuals with hypertension were recruited for this research, and two questionnaires were returned. The 1st questionnaire focused on gathering data on demographic features. The subsequent questionnaire aimed to assess the participants'

attitudes, knowledge, and practices. The surveys demonstrated both stability and internal consistency. Among the participants, (73%) were aware of the standard range for hypertension. Among the participants, (87.3%) knew that stress, (70.9%) knew that obesity, and (48.2%) knew that age was a risk factor associated with hypertension. Approximately (60%) of the participants were aware of the potential risks associated with uncontrolled hypertension. Approximately (82.7%) of the participants believed that after the body adjusted to hypertension, there was no need for the use of antihypertensive medication. Approximately (13.6%) of the participants monitored their blood pressure on a daily basis, whereas (11.8%) of the participants tested it monthly. There was a strong association between the educational degree of participants and their knowledge scores. There was a strong association between attitudes and knowledge, as well as between practices and attitudes scores. These results are important for the development of effective and ongoing self-management hypertension education programs. These programs should focus primarily on providing practical knowledge regarding control and preventive strategies (36).

1.1.7 Satisfaction with the treatment and adherence to taking antihypertensive medications

Inadequate compliance with hypertension medication is a prominent health issue and a notable contributor to morbidity, disability, and death linked with hypertension (37). In Nigeria, a study was conducted to establish the correlation between treatment satisfaction and medication adherence among hypertension patients in Ibadan, Nigeria (37). An observational study design in which hypertension patients were recruited in succession from 5 hospitals in Ibadan, Nigeria, was used. Data were collected via a pretested questionnaire that was presented by an interviewer. A sensitivity analysis was performed to account for unmeasured binary confounders. The threshold for statistical significance was established at $p < 0.05$ for a two-tailed test. The research included 342 participants, with an average age of 59.6 ± 12.6 years. The overall rate of medication adherence was (35.1%), as indicated by the MMAS-8 score of 8. The study revealed that treatment satisfaction was significantly linked to drug adherence, even after controlling for other factors. Sensitivity analysis revealed that the observed correlation between treatment satisfaction and medication adherence was likely caused by unmeasured confounding factors. There was a poor level of adherence to medicine, and

satisfaction with therapy was shown to independently increase medication adherence. The inclusion of treatment satisfaction techniques is essential in all therapeutic intervention packages for this particular demographic (37).

A study was carried out on nephrology outpatients who were prescribed antihypertensive medications and then transitioned to combination therapies (38). A retrospective analysis was conducted to investigate the changes in the efficacy of antihypertensive medications and blood pressure levels before and after treatment modifications. Furthermore, the research included a patient questionnaire that assessed changes in blood pressure when measured at home, the occurrence or nonoccurrence of skipped doses, the influence on expenditures linked to medicine, and the degree of patients' contentment about combination therapies. The survey findings from a sample of 90 participants indicated that switching to combination drugs led to a decrease in missed doses, a reduction in blood pressure when measured in an outpatient setting, and a decrease in medication-related expenses for all patients, including those without chronic kidney disease (CKD) and those with CKD. The results of our research indicate that the use of combination antihypertensive medicines led to increased adherence, decreased medication-related costs, and high levels of patient satisfaction. Combination medications for individuals with hypertension might provide advantages from both medical and economic perspectives (38).

A randomized, double-blind clinical study was undertaken among six hundred and twenty-six men with mild–moderate hypertension to assess the impact of propranolol, methyldopa, and captopril on their quality of life (39). Hydrochlorothiazide was used as necessary to regulate blood pressure. Following a 24-week treatment duration, all three groups exhibited comparable blood pressure management, albeit a smaller number of patients who were administered propranolol needed hydrochlorothiazide. Patients who were prescribed captopril, either alone or in conjunction with a diuretic, had the lowest likelihood of discontinuing therapy owing to negative side effects. The withdrawal rate for captopril was (8%), whereas it was (20%) for methyldopa and (13%) for propranolol. The sleep-disruptive therapy groups returned equivalent outcomes in visual memory and social participation. The overall well-being of those given captopril was significantly better ($P<0.05$ to <0.01) than that of those taking methyldopa; in addition, they had fewer side effects and performed better on job performance, visual–motor

functioning and life satisfaction scales than their counterparts did. Similarly, individuals who received propranolol performed better on measures of job performance than did subjects who took methyldopa. On the other hand, patients who received captopril were less likely to have adverse effects and sexual dysfunction than were those who received propranolol. They also improved significantly ($P<0.05$ to <0.01) in terms of overall well-being compared with individuals receiving methyldopa. Our findings suggest that antihypertensive drugs have different influences on the general health of individuals, which could be more effectively measured by means of standardized psychosocial tools (39).

Another study investigated the correlation between medication adherence and treatment satisfaction among hypertensive patients receiving care at the hypertension outpatient clinic at Lagos University Teaching Hospital (40). The investigation was performed at Lagos University Teaching Hospital, which served as the setting for this descriptive cross-sectional study. The study strategy included the sequential recruitment of hypertensive patients from the outpatient clinic. The research included 500 participants, with an average age of 58.9 ± 13.3 years. Research revealed that the majority of respondents (446 [89.2%]) had a moderate level of adherence to antihypertensive medication. Nevertheless, a mere (1.0%) of the participants indicated 'strong' adherence. The moderate-adherence group had the highest mean ratings for all the satisfaction categories and the overall domain. The level of satisfaction with the treatment was shown to be significantly correlated with the degree of adherence to medication. In this research, the rate of high adherence to hypertension medication was (1%), with a favorable correlation between treatment satisfaction and medication adherence. It is advisable to provide ongoing, individualized adherence instructions and counseling to individuals with hypertension (40).

Zyoud et al. (2013) performed a different study aimed at examining the parameters connected to adherence to antihypertensive therapy in patients with hypertension and determining the relationship between satisfaction with treatment and adherence to antihypertensive medication (10). This included the sociodemographic characteristics of the participants as well as disease-related attributes. The data analysis was conducted via SPSS version 15.0. The research included a total of 410 participants with hypertension. The average age of the participants was 58.38±10.65 years. Fifty-two

percent of the participants were female, and 36.8% reported limited adherence to antihypertensive treatment. Patients with varying degrees of adherence showed a notable disparity in the average ratings for the global satisfaction ($p < 0.001$), convenience ($p < 0.001$), and effectiveness ($p < 0.001$) domains. However, there was no significant difference in the side effects ($p = 0.466$) category. Following the incorporation of confounders by multiple linear regression, the association between medication adherence and general treatment satisfaction remained statistically significant ($p = 0.001$). Inadequate treatment satisfaction might hinder the achievement of high treatment adherence rates. These research results have the potential to be beneficial in therapeutic settings, particularly in the initial management of patients with hypertension, but there is still an opportunity to increase treatment satisfaction (10).

A study was conducted to determine the characteristics that are significantly correlated with medication adherence in a cohort of elderly Chinese individuals diagnosed with essential hypertension (41). Research has been conducted to examine the associations between variables at a certain point in time. A total of one hundred and nighty five older persons were recruited from twelve centers to gather data. A multivariate logistic regression analysis was conducted to investigate the aspects that were substantially linked to medication adherence, such as sickness perceptions, consultation satisfaction, and demographic and clinical features. A majority of the participants (55.9%) admitted to some level of medication nonadherence. Increased medication adherence was independently linked with older age, living alone, and perceptions related to treatment management. The odds ratios ranged from 1.1-1.9. These findings emphasize the importance of fostering optimistic ideas for the management of hypertension via therapy. Moreover, it is important to regularly monitor the compliance behavior of younger persons who are living with their families (41).

Research has been conducted to examine the safety and effectiveness of a novel extended-release version of diltiazem in diverse samples of hypertensive patients (42). Additionally, the study aimed to measure the satisfaction of both physicians and patients with the medication. Physicians recruited patients with hypertension for a 30-day trial, where they would be assessed and treated at an initial appointment and two subsequent follow-up sessions. The collected data for each patient included demographic information, diltiazem dose strength, blood pressure measurements, and adverse events.

A total of 15,155 doctors completed the first questionnaire, and 9,679 (64%) completed the final clinical assessment questionnaire. A total of 139,965 individuals with hypertension were included in the study. Blood pressure data were initially and subsequently collected for 50,856 patients, accounting for (36%) of the total number of patients. The average systolic blood pressure (SBP) decreased by 10.9 mm Hg at the first follow-up and by 15.5 mm Hg at the second follow-up. The average decreases in diastolic blood pressure were 6.7 mm Hg and 9.2 mm Hg, respectively. The most frequently reported adverse events were edema, headache, dizziness, nausea, and rash. Two-thirds of these occurrences were related to diltiazem. None of the adverse events related to diltiazem were observed in a frequency exceeding (1%) of patients. The doctors and patients both praised diltiazem for this, and a high level of satisfaction was observed. The results of this extensive study performed without randomization revealed that diltiazem was well tolerated and significantly decreased systolic and diastolic blood pressure with medical relevance. Moreover, many doctors and patients expressed their satisfaction at a relatively high rate among hypertensive individuals from different ethnic groups (42).

To evaluate health-related quality of life (HRQOL) and possible variables that can affect it, the authors of this study conducted another survey (43). Additionally, it aims to determine whether there is any correlation between HRQOL and adherence to treatment, confidence in physicians and treatment satisfaction among hypertensive patients. In a cross-sectional study, 196 patients were recruited from hospitals within Beirut, North Lebanon and South Lebanon. Improved adherence to antihypertensive medication was strongly and positively associated with higher HRQOL in most areas, except for general health, where the association did not approach statistical significance ($P = .089$). Improved adherence was also strongly associated with increased treatment satisfaction, specifically in terms of side effects, convenience, and overall satisfaction. However, there was no significant correlation between adherence and treatment efficacy. Additionally, there was a notable improvement in confidence in the doctors. There was a substantial and positive association between higher treatment satisfaction (TSQM domains) and improved overall HRQOL. There was a substantial and positive correlation between higher levels of confidence in physicians and better psychological health, environment, and overall HRQOL dimensions. Ultimately, the efficacy, convenience, and overall satisfaction with TSQM were notably better when there was a

greater level of confidence in the physician. The findings of the research revealed that there was a correlation between better adherence to treatment, higher general satisfaction and improved quality of life. For example, a positive correlation exists between greater patient satisfaction with antihypertensive therapy, confidence in their physician and better compliance (43).

A study was conducted primarily to investigate the relationships among medication adherence, treatment satisfaction, and disease perception among Lebanese hypertensive patients (44). The study also assessed the relationship between adherence to medication and the management of blood pressure (BP). For this research, a cross-sectional design was used whereby patients were recruited from both physician practice offices and community pharmacies found in Beirut. People who had been on hypertension treatment for at least three months were requested to participate in the study. Blood pressure was also assessed and documented. A total of 117 participants were included, and among them, (29.1%) exhibited inadequate adherence to their antihypertensive medication regimen (as indicated by MMAS-8 scores less than 6). Individuals with strong adherence were 3.5 times more likely to have well-controlled hypertension than individuals with poor adherence were (P=0.010). Patient satisfaction with the treatment was much greater in those who demonstrated excellent adherence to the prescribed regimen (P<0.001). There were no significant associations between the subjects' sociodemographic, disease-related, or drug-related features and medication adherence. Regarding the impression of sickness, while the average BIPQ score of participants who followed the prescribed treatment was lower than the average score of those who did not follow the treatment, this difference was not statistically significant. Overall, the study revealed that treatment pleasure is a reliable indicator of adherence. Research is necessary to ascertain whether treatments aimed at increasing satisfaction may enhance the adherence to and management of blood pressure (44).

Bharmal et al. (2009) emphasized the use of the Treatment Satisfaction Questionnaire for Medicine (TSQM) Version 1.4, the most reliable and valid tool that measures patients' satisfaction with their medication (45). The instrument assesses satisfaction along four subscales: side effects, convenience, efficacy and overall satisfaction. This is because if doctors are to use it to evaluate the side effects experienced by patients during observational studies, they may evaluate the incidence or absence of negative

incidents, which is not normal in clinical settings and could therefore interfere with regular medical treatment procedures. Thus, five questions related to side effects were removed to develop a shortened version of the TSQM called the TSQM-9 from its original version, the TSQM version 1.4. This study administered the interactive voice response system (IVRS)-based psychometric evaluation of the TSQM-9 among patients who were prescribed antihypertensive agents. An online panel was used to select a cohort of 3,387 individuals who reported using prescription antihypertensive drugs. The participants were instructed to fill out the IVRS-administered TSQM-9 questionnaire at the beginning of the trial, along with the modified Morisky scale. They were then requested to complete the same questionnaires again within a period of 7 to 14 days. Researchers have performed several psychometric studies. A total of 396 participants successfully completed all the research procedures. The study consisted of a gender distribution in which males accounted for approximately (50%) of the participants. The racial and ethnic composition of the individuals was as follows: (58.3%) were white, (18.9%) were black, (17.7%) were Hispanic, and (5.1%) were either Asian or from other racial/ethnic backgrounds. The structural equation modeling results provided evidence of construct validity for the TSQM-9 since the observed data fitting the Decisional Balance Model of Treatment Satisfaction were evident, even in the absence of the side effects domain. The TSQM-9 domains demonstrated strong internal consistency, as shown by Cronbach's alpha values of 0.84 and above. The TSQM-9 domains exhibited strong test–retest reliability, as shown by high intraclass correlation coefficients above 0.70. The TSQM-9 domains successfully distinguished between persons who exhibited low, medium, and high compliance with medication, demonstrating moderate to high effect sizes. Significant relationships were found between the medication adherence scale score and other measures, indicating convergent validity. The IVRS-administered TSQM-9 was determined to be a dependable and accurate tool for evaluating treatment satisfaction in real-life research designs, where it is possible that using the adverse effects section of the TSQM would disrupt regular clinical care (45).

1.2 Problem statement

Poor adherence among patients who are taking two or more medications or who do not tolerate the side effects is one of the factors that influences disease progression and can be directly associated with deteriorated health outcomes among patients with hypertension (46). Therefore, assessing, improving, supporting, and maintaining adherence to antihypertensive medications among patients with hypertension are essential efforts to improve the health outcomes of patients with hypertension (47).

In Palestine, studies on the attitudes and satisfaction of patients with hypertension toward antihypertensive medications are lacking. Therefore, there is a need to assess the attitudes of patients with hypertension toward taking antihypertensive medications and their satisfaction with the treatment. The findings of this study might be used in designing measures to increase support and maintain adherence to antihypertensive medications by patients with hypotension who are treated in the Palestinian healthcare system. Adherence to antihypertensive medications can significantly improve the health outcomes of patients with hypertension and their quality of life.

1.3 Study questions

- What were the attitudes of hypertensive patients in Palestine toward their antihypertensive medications?
- How satisfied were the hypertensive patients in Palestine with their antihypertensive medications?
- Was there any association between the attitudes of hypertensive patients toward taking antihypertensive medications and their satisfaction with the treatment?
- What are the factors that influence the satisfaction of hypertensive patients with their antihypertensive medications?

1.4 Objectives

The general aim of the study was to assess the associations between the attitudes of patients with hypertension toward taking antihypertensive medications and their satisfaction with the treatment.

- To evaluate the attitudes of hypertensive patients in Palestine toward taking antihypertensive medications.
- To assess the satisfaction of hypertensive patients in Palestine with their antihypertensive medications.
- To assess the associations between attitudes toward taking antihypertensive medications and satisfaction with treatment.
- To assess the factors that could be associated with the attitudes of hypertensive patients toward taking antihypertensive medications and their satisfaction with treatment.

1.5 Importance of the study

Given the limited number of studies that have been conducted to assess the associations between the attitudes of hypertensive patients toward taking their medications and their satisfaction with treatment, a review of the published literature revealed that there are no studies on the attitudes of hypertensive patients toward taking their medications and their satisfaction with treatment in Palestine.

The attitudes of antihypertensive patients toward taking antihypertensive medications and their satisfaction with treatment were assessed. It has been proposed that positive attitudes and higher satisfaction can improve adherence to antihypertensive medications and patient outcomes.

In addition, determining the factors that affect attitudes toward taking antihypertensive medications and satisfaction with treatment can help inform the design of measures to improve adherence to taking antihypertensive medications, reduce nonadherence, and optimize the health outcomes of patients.

Chapter Two

Methods

2.1 Study design

This study was conducted in a cross-sectional design utilizing face to face questionnaires as the study tool. This study design was selected because it was the most suitable design for achieving the objectives of the study.

2.2 Study setting

This study was conducted in two primary healthcare centers of the Ministry of Health (Al-Makhfeyah and Balata) in Nablus, West Bank, Palestine from 3/2023 to 9/2023.

At primary healthcare centers, outpatient clinics serve patients who have chronic diseases, review their medications, and follow up with their treatment. The patients were met at the centers and were invited to take part in the study.

Primary healthcare centers in the West Bank, including Al-Makhfeyah and Balata, provide the foundation of the healthcare system, providing a wide array of critical medical services. These facilities provide consultations with general practitioners for various health issues, ranging from simple ailments to chronic disease management, including drug assessments and treatment follow-ups. Maternal and child health services are essential, including prenatal care, immunizations, well-baby examinations, and family planning. Primary healthcare centers are essential in the management of chronic illnesses such as diabetes and hypertension, including patient education and lifestyle counseling. Immunization programs, health education campaigns, and basic laboratory services are generally accessible. Certain primary healthcare centers may further include pharmaceutical services, dental treatment, mental health assistance, and physiotherapy. Serving as the first point of contact for several individuals, these centers provide accessible and cost-effective treatment, often functioning as a conduit to specialist services via referrals. They are crucial for disease prevention, health promotion, and the continuous treatment of chronic illnesses in the community.

2.3 Population

The study population in this study included all hypertensive patients who visited the outpatient primary healthcare clinics of the Ministry of Health in Nablus, West Bank, Palestine.

2.3.1 Inclusion criteria

- Patients with hypertension.
- Patients taking antihypertensive medications.
- Patients aged 18 years and above.
- Patients who provided written informed consent and agreed to participate in the study.

2.3.2 Exclusion criteria

- Patients who were diagnosed with hypertension and did not take antihypertensive medications.
- Patients who were unable to complete the questionnaire.

2.4 Sample size and sampling method

The sample size was calculated by using the Raosoft® sample size calculator. Assuming that more than 20,000 hypertensive patients visited two outpatient primary healthcare clinics of the Ministry of Health (Al-Makhfeyah and Balata) in Nablus, West Bank, Palestine, during the study period, a response distribution of (50%), and a margin of error of (5%), the sample size was calculated at a (95%) confidence interval as 377 patients.

Hypertensive patients who visited the outpatient primary healthcare clinics of the Ministry of Health in Nablus, West Bank, Palestine, during the study period were approached and invited to participate in the study. The objectives of the study were explained to the patients, the information was collected after the verbal explanation. The patients were asked to complete a questionnaire through a face–to–face interview. The patients were conveniently recruited until the sample size was reached.

2.5 Data collection and study tools

The data were collected via a questionnaire as the study tool. The questionnaire was developed on the basis of previous studies and was composed of three sections.

The first section collected the demographic and clinical variables of the patients, including age, time since diagnosis with hypertension, antihypertensive medications, sex, marital status, presence of food or drug allergies, past medical history, past surgical history, and smoking status. In addition, the weight and height of each patient were collected to calculate the body mass index (BMI).

The second section included the Arabic translated and culturally adapted Drug Attitude Inventory (DAI-10) (48). The DAI-10 measures the attitudes and adherence of hypertensive patients toward their antihypertensive medications via 10 statements. For each statement, the patients had to agree or disagree (true/false).

The third section contained the Arabic version of the Treatment Satisfaction Questionnaire for Medication (TSQM) (48). The TSQM measures the satisfaction of hypertensive patients with their treatment. The TSQM was acquired from Quintiles Strategic Research Services. The TSQM comprises 14 items assessing the perceived efficacy of antihypertensive drugs (items 1-3), side effects (items 4-8), convenience (items 9-11), and overall satisfaction (items 12-14). Items 1-3 were evaluated on a scale ranging from highly dissatisfied to extremely satisfied. Item 4 received a rating of either no or yes. Item 5 received ratings of very bothersome, slightly troublesome, or somewhat bothersome. Items 6-8 were evaluated as either a significant amount, considerable amount, moderate amount, minimal amount, or not at all. Items 9-10 were evaluated as very difficult, difficult, fairly easy, easy, very easy, or extremely easy. Item 11 received ratings of very inconvenient, inconvenient, somewhat convenient, convenient, very convenient, or extremely convenient. Item 12 had ratings of not at all confident, slightly confident, very confident, very confident, or extremely confident. Item 13 was evaluated as not at all certain, slightly certain, moderately certain, very certain, or highly certain. Item 14 received ratings of extremely unsatisfied, very displeased, dissatisfied, slightly satisfied, satisfied, very satisfied, or extremely satisfied. Both DAI-10 and TSQM were previously translated into Arabic and culturally adapted to be used among Arab populations.

A team of three qualified clinical pharmacologists and pharmacists, all experts in public health research and specialists in this type of study, evaluated the final version of the questionnaire for its face and content validity. They reviewed the organization, word definitions, medical terminology, appropriateness, completeness, and logical flow of statements. After refining the questionnaire, a pre-test was conducted among 20 hypertensive patients to assess the clarity and reliability of the questions, leading to necessary revisions. These 20 patients were not included in the final analysis. To assess the questionnaire's reliability, internal consistency testing was conducted using Cronbach's alpha. The internal consistency for the domains of TSQM 1.4 in our study was as follows: Effectiveness (3 items, Cronbach's Alpha=0.916), Side effects (4 items, Cronbach's Alpha=0.731), Convenience (3 items, Cronbach's Alpha=0.780), and Overall Satisfaction (3 items, Cronbach's Alpha=0.902). The internal consistency of the DAI-10 instrument was 0.723, demonstrating high reliability.

2.6 Data and statistical analysis

For the DAI-10, items 2, 5, 6, and 8 were negatively related. The DAI-10 score ranges from -10 to +10. A total score greater than 0 indicates a favorable attitude toward drugs, whereas a total score less than 0 indicates a negative attitude toward medications (49, 50).

The TSQM was scored as follows (51):

- The perceived effectiveness of the antihypertensive medications score was calculated as ([item 1 + item 2 + item 3] – 3)/18) × (100%).
- The side effects score was calculated as follows: when item 4 was answered as No = (100%), the side effects score was calculated as ([(item 5 + item 6 + item 7 + item 8) – 4]/16) × (100%).
- The convenience score was calculated as ([(item 9 + item 10 + item 11) – 3]/18) × (100%).
- The global satisfaction score was calculated as ([(item 12 + item 13 + item 14)) - 3]/14) × (100%).

The data collected in this study were analyzed via IBM SPSS v. 22.0. The categorical data are presented as frequencies and percentages. The continuous variables are presented as medians with their corresponding interquartile ranges [first quartile "Q1",

third quartile “Q3”]. Differences in the scores were assessed via Mann–Whitney U tests. Correlations were assessed via Spearman’s ranked correlations. Correlation was described as low when the Spearman’s rho was < 0.30, moderate when the Spearman’s 0.70 < rho ≥ 0.30, and high when the Spearman’s rho was ≥ 0.70. To control for confounding factors, the variables that were significantly associated with the Mann–Whitney U tests and Spearman’s ranked correlations were included in multiple linear regression models. A p value < 0.05 was considered statistically significant.

2.7 Ethical approval

The study was conducted following the ethical principles of An-Najah National University and those in the Declaration of Helsinki. All issues of the study protocol were authorized by An-Najah National University Institutional Review Board (IRB) and local health authorities, including the use of patient clinical information. All patients provided written informed consent.

2.8 Validity and reliability study

A team of three qualified clinical pharmacologists and pharmacists, all experts in public health research and specialists in this type of study, evaluated the final version of the questionnaire for its face and content validity. They reviewed the organization, word definitions, medical terminology, appropriateness, completeness, and logical flow of statements. After refining the questionnaire, a pre-test was conducted among 20 hypertensive patients to assess the clarity and reliability of the questions, leading to necessary revisions. These 20 patients were not included in the final analysis. To assess the questionnaire’s reliability, internal consistency testing was conducted using Cronbach’s alpha. The internal consistency for the domains of TSQM 1.4 in our study was as follows: Effectiveness (3 items, Cronbach’s Alpha=0.916), Side effects (4 items, Cronbach’s Alpha=0.731), Convenience (3 items, Cronbach’s Alpha=0.780), and Overall Satisfaction (3 items, Cronbach’s Alpha=0.902). The internal consistency of the DAI-10 instrument was 0.723, demonstrating high reliability.

In this study, the data collected were used for scientific research only. All collected data were confidential. The patients were a confirmation of data privacy. All the data were kept safe throughout the study.

Chapter Three

Results

3.1 Demographic and clinical characteristics of the patients

A total of 365 patients with hypertension were included in this study. Table 1 presents the demographic and clinical characteristics of the patients who were included in this study.

The patients had a mean age of 58.5 ± 8.8 years, and the median age was 58.0 (53.0–64.0) years. The average time during which the patients suffered from hypertension was 8.6 ± 5.9 years, and the median duration was 8 years, with an interquartile range (5-10 years). The majority of the sample were female (68.5%), and 112 (31.5%) were men. The sample included more married patients than unmarried patients. The majority of the patients did not have any documented food or drug allergies (93.8%, n = 334). Nearly (87%) of the patients did not have any past medical history. A total of two hundred fifty-four people (71.3%) had no past surgical history, whereas one hundred and two others (28.7%) underwent surgical operations. In this study, one hundred forty-six patients did not smoke, constituting approximately (41%) of the sample. Among the patients, 123 (34.6%) were classified as either overweight or obese.

Table 1

Demographic and clinical characteristics of the patients (n = 356)

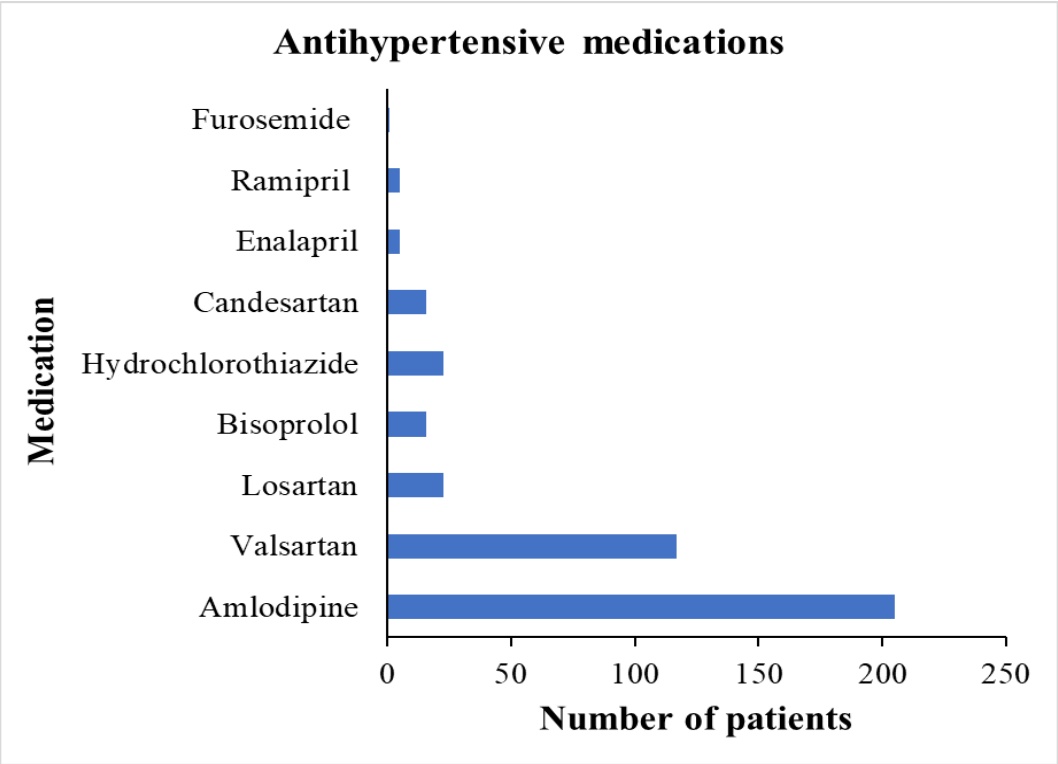
Characteristic	n	%	Mean ± SD	Median [Q1, Q3]
Age (years)			58.5 ± 8.8	58.0 [53.0, 64.0]
Time since diagnosis with hypertension (years)			8.6 ± 5.9	8.0 [5.0, 10.0]
Sex				
Male	112	31.5		
Female	244	68.5		
Marital status				
Currently unmarried	48	13.5		
Currently married	308	86.5		
Has a documented food or drug allergy				
No	334	93.8		
Yes	22	6.2		
Has a past medical history				
No	309	86.8		
Yes	47	13.2		
Has a past surgical history				
No	254	71.3		
Yes	102	28.7		
Smoking				
No	210	59.0		
Yes	146	41.0		
Body mass index				
Healthy weight	233	65.4		
Overweight/obese	123	34.6		

3.2 The antihypertensive medications used by the patients

In this study, more than half of the patients (57.6%, n = 205) were on amlodipine. Additionally, valsartan was used by 117 (32.9%) of the patients. Moreover, the patients also used losartan, bisoprolol, hydrochlorothiazide, candesartan, enalapril, ramipril, and furosemide. The distributions of the antihypertensive medications used by the patients are shown in Figure 1.

Figure 1

Distribution of the antihypertensive medications used by the patients



3.3 Attitudes of patients toward their antihypertensive medications

Table 2 displays the answers of the patients to the DAI-10 questionnaire. In this study, the vast majority of the patients (95.2%) believed that they benefited from their antihypertensive drugs, and in their opinion, the benefits of their antihypertensive drugs outweighed the drawbacks. More positive attitudes were enforced when (94.7%) of the patients stated that they felt more relaxed when they took antihypertensive drugs and (95.5%) of the patients stated that they felt more normal when they took antihypertensive drugs. On the other hand, (93.3%) of the patients disagreed with the statements that were negatively stated in the DAI-10 questionnaire, which included feeling uncomfortable while using antihypertensive medications, and indicated that they felt comfortable while taking their antihypertensive medications. In addition, (91.6%) of the patients reported that they did not feel tired or sluggish when taking their antihypertensive medications.

A considerable percentage of the patients (88.8%) reported that they took their antihypertensive medications regularly and not only when they felt sick. On the other

hand, (11.2%) of the participants admitted that they only took antihypertensive medications when they were sick. Despite a small proportion of the patients (10.7%) reporting that they felt unnatural for their minds and body to be controlled by medications, the vast majority of the patients (89.3%) reported that they disagreed with this statement.

Furthermore, the vast majority of the patients (97.5%) in this study stated that their thoughts were clearer when they took their antihypertensive medications. In addition, (77.8%) of the patients stated that adhering to their antihypertensive medications helped them prevent further illnesses. On the other hand, (22.2%) of the patients did not believe that their antihypertensive medications helped them prevent illness.

Table 1

Attitudes of patients toward taking antihypertensive medications as measured via the DAI-10 questionnaire

		True		False	
#	Item	n	%	n	%
1	The benefits of medicine surpass the drawbacks for me.	339	95.2	17	4.8
2*	I experience discomfort while on medicine.	24	6.7	332	93.3
3	I select my own medications.	7	2.0	349	98.0
4	Medications induce a greater sense of relaxation.	337	94.7	19	5.3
5*	Medications induce fatigue and lethargy in me.	30	8.4	326	91.6
6*	I administer medication solely when I am unwell.	40	11.2	316	88.8
7	I experience a greater sense of normalcy while on medicine.	340	95.5	16	4.5
8*	It is abnormal for my mind and body to be regulated by medicines.	318	89.3	38	10.7
9	My cognition is more lucid while on medications.	347	97.5	9	2.5
10	Adhering to my medication regimen enables me to avert illness.	277	77.8	79	22.2

3.4 Satisfaction of patients with their antihypertensive medications

In this study, the patients' satisfaction with their antihypertensive medications was measured via the TSQM tool. The extent of satisfaction/dissatisfaction across different dimensions, including the effectiveness of antihypertensive medications, side effects, convenience, and overall satisfaction, is shown in Table 3 and Table 4.

The majority of the patients stated that they were satisfied with the effectiveness of their antihypertensive medications. Among the patients, (59.6%) were very satisfied, and (23.3%) were satisfied with the ability of antihypertensive medications to treat the disease condition. In addition, (62.9%) of the patients were very satisfied with the ability of antihypertensive medications to relieve symptoms, and (63.2%) of the patients were very satisfied with the time it took the medication to exert a therapeutic effect.

In this study, a minority (8.1%, n = 29) of the patients reported experiencing adverse effects. A tiny proportion of the patients reported that adverse effects affected their physical and mental health. Notably, only (0.6%) of the patients reported that adverse effects interfered with their physical health to a small extent, and (4.5%) of the patients reported that adverse effects interfered with their mental health to a small extent. The adverse effects of antihypertensive medications minimally affect the overall satisfaction of patients.

The majority of the patients reported that they found it easy to use their antihypertensive medications. Moreover, more than half of the patients (55.3%) found it easy to plan medications. In addition, more than half of the patients (51.4%) reported that they found it convenient to take antihypertensive medications.

There was a high level of confidence in the medications used and overall high satisfaction among the patients. Among the patients, (76.1%) stated that they felt very confident that taking antihypertensive medications was beneficial, and (77%) of the patients were very certain that the benefits of their antihypertensive medications outweighed the drawbacks. Overall, the majority of the patients (68.5%) were very satisfied, and (14.3%) were satisfied.

Table 2

Extent of patients' satisfaction with their antihypertensive medications as measured via the TSQM tool

#	Item	Extremely dissatisfied n (%)	Very dissatisfied n (%)	Dissatisfied n (%)	Somewhat satisfied n (%)	Satisfied n (%)	Very satisfied n (%)	Extremely satisfied n (%)
	Effectiveness							
1	To what extent are you satisfied or unsatisfied with the medication's efficacy in preventing or treating your condition?	1 (0.3%)	3 (0.8%)	10 (2.8%)	34 (9.6%)	83 (23.3%)	212 (59.6%)	13 (3.7%)
2	To what extent are you satisfied or unsatisfied with the efficacy of the drug in alleviating your symptoms?	0 (0.0%)	4 (1.1%)	13 (3.7%)	31 (8.7%)	77 (21.6%)	224 (62.9%)	7 (2.0%)
3	What is your level of satisfaction or dissatisfaction with the time required for the drug to take effect?	2 (0.6%)	1 (0.3%)	5 (1.4%)	25 (7.0%)	92 (25.8%)	225 (63.2%)	6 (1.7%)
	Side effects	No n (%)	Yes n (%)					
4	Do you encounter any adverse effects from this medication?	327 (91.9%)	29 (8.1%)					
		Very bothersome n (%)	Somewhat bothersome n (%)	A little bothersome n (%)				
5	What is the severity of the adverse effects associated with the medication prescribed for your condition?	3 (0.8%)	16 (4.5%)	10 (2.8%)				
		A great deal n (%)	Quite a bit n (%)	Somewhat n (%)	Minimally n (%)	Not at all n (%)		
6	How much do the adverse effects impact your physical health and functional capacity (e.g., strength, energy levels, etc.)?	1 (0.3%)	2 (0.6%)	18 (5.1%)	4 (1.1%)	4 (1.1%)		
7	To what degree do the adverse effects impede your cognitive function (e.g., clarity of thought, alertness, etc.)?	0 (0.0%)	1 (0.3%)	5 (1.4%)	7 (2.0%)	16 (4.5%)		
8	To what extent have the side effects of the drug influenced your overall pleasure with it?	1 (0.3%)	4 (1.1%)	17 (4.8%)	6 (1.7%)	1 (0.3%)		

Convince and global satisfaction ratings are shown in Table 4.

Table 3

Extent of patients' convenience global satisfaction ratings with their antihypertensive medications as measured via the TSQM tool

#	Convenience	Very difficult n (%)	Difficult n (%)	Somewhat easy n (%)	Easy n (%)	Very easy n (%)	Extremely easy n (%)	
9	What is the level of ease or difficulty associated with utilizing the drug in its present formulation?	1 (0.3%)	12 (3.4%)	69 (19.4%)	208 (58.4%)	57 (16.0%)	9 (2.5%)	
10	What is the level of ease or difficulty in scheduling the administration of the drug each time?	3 (0.8%)	14 (3.9%)	80 (22.5%)	197 (55.3%)	51 (14.3%)	11 (3.1%)	
		Very inconvenient n (%)	Inconvenient n (%)	Somewhat convenient n (%)	Convenient n (%)	Very convenient n (%)	Extremely convenient n (%)	
11	What is the convenience or inconvenience of adhering to the pharmaceutical regimen as prescribed?	2 (0.6%)	4 (1.1%)	32 (9.0%)	126 (35.4%)	183 (51.4%)	9 (2.5%)	
	Global satisfaction	Not at all confident n (%)	A little confident n (%)	Somewhat confident n (%)	Very confident n (%)	Extremely confident n (%)		
12	Overall, how confident are you that taking this medication is a good thing for you?	8 (2.2%)	12 (3.4%)	50 (14.0%)	271 (76.1%)	15 (4.2%)		
		Not at all certain n (%)	A little certain n (%)	Somewhat certain n (%)	Very certain n (%)	Extremely certain n (%)		
13	What is your level of confidence that the benefits of your drug surpass its drawbacks?	12 (3.4%)	8 (2.2%)	47 (13.2%)	274 (77.0%)	15 (4.2%)		
		Extremely dissatisfied n (%)	Very dissatisfied n (%)	Dissatisfied n (%)	Somewhat satisfied n (%)	Satisfied n (%)	Very satisfied n (%)	Extremely satisfied n (%)
14	Considering all factors, how satisfied or dissatisfied are you with this medication?	2 (0.6%)	3 (0.8%)	7 (2.0%)	33 (9.3%)	51 (14.3%)	244 (68.5%)	16 (4.5%)

3.5 Associations between demographic and clinical variables and attitudes toward antihypertensive medications and patient satisfaction with the treatment

The associations between the different demographic and clinical variables of the patients and their attitudes toward their antihypertensive medications and their satisfaction with the treatment were investigated. The associations are shown in Table 5.

Compared with female patients, male patients reported lower convenience scores ($p = 0.021$). Moreover, male patients tended to report slightly greater side effects. However, the difference in the side effect scores was not statistically significant ($p = 0.094$). On the other hand, there were no statistically significant associations between the sex of the patients and the DAI-10 scores, perceived effectiveness of antihypertensive medications, or global satisfaction scores.

There were no statistically significant associations between the marital status of the patients and the DAI-10 score, perceived effectiveness of antihypertensive medications, side effects, convenience, or global satisfaction score.

The patients who had documented food and drug allergies reported significantly lower DAI-10 scores than did the patients who did not have documented food or drug allergies ($p < 0.001$). In addition, those patients also reported lower perceived effectiveness of antihypertensive medications ($p = 0.001$), higher side effect scores ($p < 0.001$), and lower global satisfaction scores ($p < 0.001$). Although the convenience scores reported by the patients who had documented food and drug allergies were lower than those reported by the patients who did not have documented food or drug allergies, the difference was not statistically significant ($p = 0.131$).

Patients who had a past medical history reported significantly lower DAI-10 scores ($p = 0.007$). In addition, the patients who had a past medical history also reported significantly higher side effect scores ($p = 0.018$). Moreover, those patients also reported lower global satisfaction scores ($p = 0.019$). Although the perceived effectiveness of antihypertensive medications reported by patients who had a past medical history was lower than that reported by patients who did not have a past medical history, the difference was not statistically significant ($p = 0.054$). However, the difference in the convenience scores was not statistically significant ($p = 0.505$).

The side effect scores reported by the patients who had a past surgical history were significantly lower ($p = 0.042$) than those reported by the patients who did not have a past surgical history. On the other hand, there were no statistically significant differences in the DAI-10 scores, perceived effectiveness of antihypertensive medication scores, convenience scores, or global satisfaction scores between patients who had a past surgical history and patients who did not have a past surgical history.

The patients who were smokers reported significantly lower DAI-10 scores ($p = 0.002$) than did the patients who were nonsmokers. Conversely, there were no statistically significant differences in the perceived effectiveness of antihypertensive medication scores, side effect scores, convenience scores, or global satisfaction scores between patients who were smokers and nonsmokers.

Patients who were overweight or obese reported significantly lower DAI-10 scores ($p < 0.001$) than patients who were healthy in weight. Similarly, patients who were overweight or obese reported significantly lower perceived effectiveness of antihypertensive medication ($p = 0.006$), higher side effect scores ($p = 0.016$), higher convenience scores ($p = 0.003$), and higher global satisfaction ($p = 0.002$).

Table 4

Associations between demographic and clinical variables and attitudes toward antihypertensive medications and patient satisfaction with the treatment

		DAI score		Effectiveness		Side effects		Convenience		Global satisfaction	
Characteristic	n (%)	Median [Q1, Q3]	p	Median [Q1, Q3]	p	Median [Q1, Q3]	p	Median [Q1, Q3]	p	Median [Q1, Q3]	p
Sex											
Male	112 (31.5%)	6.0 [6.0, 6.0]	0.138	83.3 [66.7, 83.3]	0.632	100.0 [83.3, 100.0]	0.094	66.7 [55.6, 72.2]	0.021	78.6 [71.4, 78.6]	0.390
Female	244 (68.5%)	6.0 [4.0, 6.0]		83.3 [66.7, 83.3]		100.0 [83.3, 100.0]		72.2 [61.1, 72.2]		78.6 [71.4, 78.6]	
Marital status											
Currently unmarried	48 (13.5%)	6.0 [4.0, 6.0]	0.778	77.8 [66.7, 83.3]	0.098	100.0 [83.3, 100.0]	0.929	66.7 [55.6, 72.2]	0.143	78.6 [67.9, 78.6]	0.147
Currently married	308 (86.5%)	6.0 [4.0, 6.0]		83.3 [66.7, 83.3]		100.0 [83.3, 100.0]		72.2 [61.1, 72.2]		78.6 [71.4, 78.6]	
Has a documented food or drug allergy											
No	334 (93.8%)	6.0 [4.0, 6.0]	0.000	83.3 [66.7, 83.3]	0.001	100.0 [83.3, 100.0]	0.000	72.2 [61.1, 72.2]	0.131	78.6 [71.4, 78.6]	0.000
Yes	22 (6.2%)	-2.0 [-4.0, 4.0]		58.3 [50.0, 83.3]		100.0 [83.3, 100.0]		66.7 [50.0, 72.2]		57.1 [21.4, 78.6]	
Has a past medical history											
No	309 (86.8%)	6.0 [4.0, 6.0]	0.007	83.3 [66.7, 83.3]	0.054	100.0 [83.3, 100.0]	0.018	66.7 [61.1, 72.2]	0.505	78.6 [71.4, 78.6]	0.019
Yes	47 (13.2%)	6.0 [4.0, 6.0]		83.3 [55.6, 83.3]		100.0 [83.3, 100.0]		66.7 [58.3, 72.2]		78.6 [50.0, 78.6]	
Has a past surgical history											
No	254 (71.3%)	6.0 [4.0, 6.0]	0.809	83.3 [66.7, 83.3]	0.567	100.0 [83.3, 100.0]	0.042	72.2 [61.1, 72.2]	0.343	78.6 [71.4, 78.6]	0.561
Yes	102 (28.7%)	6.0 [4.0, 6.0]		83.3 [66.7, 83.3]		100.0 [83.3, 100.0]		66.7 [61.1, 72.2]		78.6 [71.4, 78.6]	
Smoking											
No	210 (59.0%)	6.0 [4.0, 6.0]	0.002	83.3 [66.7, 83.3]	0.882	100.0 [83.3, 100.0]	0.420	72.2 [61.1, 72.2]	0.458	78.6 [71.4, 78.6]	0.222
Yes	146 (41.0%)	6.0 [4.0, 6.0]		83.3 [66.7, 83.3]		100.0 [83.3, 100.0]		66.7 [61.1, 72.2]		78.6 [71.4, 78.6]	
Body mass index											
Healthy weight	233 (65.4%)	6.0 [6.0, 6.0]	0.000	83.3 [66.7, 83.3]	0.006	100.0 [83.3, 100.0]	0.016	72.2 [61.1, 72.2]	0.003	78.6 [78.6, 78.6]	0.002
Overweight/obese	123 (34.6%)	6.0 [4.0, 6.0]		83.3 [66.7, 83.3]		100.0 [83.3, 100.0]		66.7 [61.1, 72.2]		78.6 [60.7, 78.6]	

3.6 Correlations between age, time since diagnosis, DAI-10 score, and TSQM score

The correlations between age, time since diagnosis, DAI-10 score, and TSQM score are shown in Table 6.

There was a significant moderate positive association between age and time since diagnosis (rho = 0.51, $p < 0.001$). On the other hand, there was a significant negative correlation between age and the DAI-10 score (rho = -0.14, p = 0.010) or convenience score (rho = -0.15, p = 0.004). On the other hand, age, perceived effectiveness of antihypertensive medications, side effect scores, and global satisfaction scores did not correlate significantly.

Similarly, there were significantly low negative associations between the time since diagnosis and the DAI-10 score (rho = -0.18, p = 0.001), convenience score (rho = -0.26, $p < 0.001$), and global satisfaction score (rho = -0.18, p = 0.001). On the other hand, the time since diagnosis, perceived effectiveness of antihypertensive medication and side effect scores did not significantly correlate.

There were moderate positive correlations between the DAI-10 scores and the perceived effectiveness of antihypertensive medications (rho = 0.36, $p < 0.001$), side effect scores (rho = 0.26, $p < 0.001$), convenience scores (rho = 0.19, $p < 0.001$), and global satisfaction scores (rho = 0.37, $p < 0.001$).

The effectiveness scores were moderately and positively correlated with the side effects scores (rho = 0.42, $p < 0.001$) and convenience scores (rho = 0.42, $p < 0.001$) and were positively correlated with global satisfaction (rho = 0.73, $p < 0.001$).

There was a low and positive correlation between the side effects scores and convenience (rho = 0.26, $p < 0.001$) and a moderate correlation with the global satisfaction scores (rho = 0.46, $p < 0.001$). There was a moderate positive correlation between convenience scores and global satisfaction scores (rho = 0.48, $p < 0.001$).

Table 5

Correlations between age, time since diagnosis, DAI-10 score, and TSQM score

Variable		Age (years)	Time since diagnosis (year)	DAI score	Effectiveness	Side effects	Convenience	Global satisfaction
Age (years)	Rho	-	0.51	-0.14	0.04	0.06	-0.15	-0.02
	p value		<0.001	0.010	0.428	0.288	0.004	0.700
Time since diagnosis (year)	Rho	0.51	-	-0.18	-0.06	-0.05	-0.26	-0.18
	p value	<0.001		0.001	0.261	0.397	0.000	0.001
DAI score	Rho	-0.14	-0.18	-	0.36	0.26	0.19	0.37
	p value	0.010	0.001		<0.001	<0.001	<0.001	<0.001
Effectiveness	Rho	0.04	-0.06	0.36	-	0.42	0.42	0.73
	p value	0.428	0.261	<0.001		<0.001	<0.001	<0.001
Side effects	Rho	0.06	-0.05	0.26	0.42	-	0.26	0.46
	p value	0.288	0.397	<0.001	<0.001		<0.001	<0.001
Convenience	Rho	-0.15	-0.26	0.19	0.42	0.26	-	0.48
	p value	0.004	<0.001	<0.001	<0.001	<0.001		<0.001
Global satisfaction	Rho	-0.02	-0.18	0.37	0.73	0.46	0.48	-
	p value	0.700	0.001	<0.001	<0.001	<0.001	<0.001	

3.7 Regression analysis

The variables that were significantly associated with the Mann–Whitney U test and correlations were included in multiple linear regression models to control for confounding variables. The linear regression models are shown in Table 7.

The DAI-10 scores were affected by the time since diagnosis ($p = 0.004$), presence of a documented food or drug allergy ($p < 0.001$), body mass index ($p = 0.004$), perceived effectiveness of the antihypertensive medications ($p = 0.010$), side effects ($p = 0.001$), convenience ($p = 0.040$), and global satisfaction scores ($p < 0.001$). On the other hand, age, past medical history, and smoking status were not significantly associated with the DAI-10 score.

The perceived effectiveness of antihypertensive medications was affected by side effect scores ($p = 0.002$), convenience scores ($p < 0.001$), and global satisfaction scores ($p < 0.001$). On the other hand, the presence of a documented food and drug allergy, BMI, and DAI-10 score were no longer associated.

The side effect scores were affected by the DAI-10 scores ($p < 0.001$), effectiveness scores ($p = 0.004$), and global satisfaction scores ($p < 0.001$). On the other hand, the presence of a documented food and drug allergy, past medical history, past surgical history, BMI, and convenience scores were no longer associated.

The convenience scores were affected by age ($p = 0.018$), time since diagnosis ($p = 0.043$), DAI-10 score ($p = 0.024$), and perceived effectiveness of antihypertensive medications ($p < 0.001$). On the other hand, sex, BMI, side effect scores, and global satisfaction scores were no longer associated.

The global satisfaction scores were affected by the time since diagnosis ($p = 0.008$), DAI-10 score ($p < 0.001$), perceived effectiveness of antihypertensive medications ($p < 0.001$), and side effects ($p < 0.001$). On the other hand, the presence of a documented food and drug allergy, past medical history, BMI, and convenience scores were no longer associated.

Table 6

Predictors of associations between the demographic and clinical variables of patients and their attitudes toward antihypertensive medications and their satisfaction with the treatment

Variable	UC	SE	SC	t	p	Variable	UC	SE	SC	t	p
DAI score						Convenience					
Age (years)	-0.01	0.01	-0.05	-1.28	0.203	Age (years)	-0.16	0.07	-0.12	-2.37	0.018
Time since diagnosis (year)	-0.05	0.02	-0.13	-2.92	0.004	Time since diagnosis (year)	-0.21	0.10	-0.11	-2.03	0.043
Allergy	-3.09	0.41	-0.30	-7.55	0.000	Sex	1.49	1.13	0.06	1.31	0.190
Past medical history	-0.48	0.28	-0.06	-1.72	0.087	BMI	-1.38	1.10	-0.06	-1.25	0.212
Smoking	0.05	0.28	0.01	0.20	0.845	DAI score	-0.63	0.28	-0.14	-2.27	0.024
BMI	-0.82	0.29	-0.16	-2.86	0.004	Effectiveness	0.35	0.06	0.42	5.56	0.000
Effectiveness	0.03	0.01	0.16	2.58	0.010	Side effects	0.03	0.05	0.03	0.55	0.585
Side effects	-0.03	0.01	-0.15	-3.43	0.001	Global satisfaction	0.10	0.06	0.14	1.61	0.109
Convenience	-0.02	0.01	-0.09	-2.07	0.040	Global satisfaction					
Global satisfaction	0.07	0.01	0.41	6.29	0.000	Time since diagnosis (year)	-0.21	0.08	-0.08	-2.66	0.008
Effectiveness						Allergy	-1.50	2.09	-0.02	-0.72	0.472
Allergy	3.74	2.03	0.07	1.84	0.067	Past medical history	-1.74	1.28	-0.04	-1.36	0.174
BMI	0.59	0.92	0.02	0.64	0.522	BMI	0.12	0.93	0.00	0.13	0.896
DAI score	0.46	0.24	0.08	1.89	0.060	DAI score	1.53	0.24	0.25	6.36	0.000
Side effects	0.14	0.04	0.11	3.06	0.002	Effectiveness	0.60	0.04	0.53	13.49	0.000
Convenience	0.20	0.04	0.17	4.83	0.000	Side effects	0.23	0.04	0.17	5.23	0.000
Global satisfaction	0.57	0.04	0.64	13.25	0.000	Convenience	0.08	0.04	0.06	1.78	0.075
Side effects											
Allergy	-4.38	2.40	-0.10	-1.82	0.069						
Past medical history	-0.47	1.49	-0.01	-0.32	0.750						
Past surgical history	-1.68	1.10	-0.07	-1.53	0.126						
BMI	-0.70	1.09	-0.03	-0.64	0.521						
DAI score	-1.01	0.29	-0.23	-3.56	0.000						
Effectiveness	0.18	0.06	0.22	2.91	0.004						
Convenience	0.01	0.05	0.01	0.20	0.845						
Global satisfaction	0.32	0.06	0.44	5.34	0.000						

Chapter Four

Discussion

4.1 Summary of the main results

Worldwide, millions of patients are living with hypertension. A lack of adherence to antihypertensive medications increases the burden of the disease and deteriorates health outcomes. It has been proposed that good attitudes toward taking antihypertensive medications and satisfaction with the treatment can improve adherence to taking antihypertensive medications and the health outcomes of patients. For the first time, this study aimed to assess the attitudes of hypertensive patients toward taking antihypertensive medications and their satisfaction with the treatment. The study was conducted in primary healthcare clinics in the Nablus area in Palestine. In this study, the majority of the hypertensive patients expressed positive attitudes toward taking antihypertensive medications. In this study, positive attitudes toward taking antihypertensive medications were associated with high satisfaction with the treatment. Satisfaction with the treatment was affected by the presence of documented food or drug allergies, past medical history, smoking status, and male sex. The findings of this study indicate that healthcare providers and decision makers should consider the demographic and clinical variables of patients when designing measures and setting policies to improve the attitudes of hypertensive patients toward taking antihypertensive medications and their satisfaction with treatment. Improving the attitudes and satisfaction of patients can improve their adherence to taking antihypertensive medications. This, in turn, can improve patient outcomes.

These findings were comparable to others that were reported in previous studies (48). Some studies have reported that adherence to taking antihypertensive medications was affected by the age of the patients, their educational levels, employment status, and knowledge about the complications of not managing hypertension (52).

4.2 Expressing positive attitudes toward taking antihypertensive medications

The majority of the hypertensive patients in this study had positive attitudes toward taking antihypertensive medications. Other studies have revealed that the attitudes of hypertensive patients toward their disease and treatment, which include the intake of

antihypertensive drugs, vary greatly(48). The results of these studies show that familiarity with hypertension and holding a belief in the reward of antihypertensive medications as positive attitudes toward taking medications influence adherence to antihypertensive medications (33, 53, 54). Most hypertensive patients have faith in the ability of antihypertensive medications to treat their hypertension. These findings suggest that these patients are most likely to use antihypertensive drugs continuously as prescribed. Adherence to antihypertensive medications has been shown to reduce the potential risks associated with uncontrolled blood pressure among hypertensive patients (48). The results therefore suggest that healthcare providers must educate patients about hypertension and help them understand the importance of using antihypertensive medicines. In the enlightenment/consulting sessions, they should concentrate on how beneficial it is for an individual to take antihypertensive drugs despite their negative effects and how antihypertensive medications make hypertensive people feel comfortable and relaxed. Further investigations could concentrate on means of educating/counseling hypertensive patients and changing their perceptions toward the use of antihypertensive drugs by determining ways to improve this attitude.

4.3 Satisfaction with the efficacy of antihypertensive medications

According to the reported findings of this research, most high blood pressure patients are concerned with the efficiency of their antihypertensive drugs. Consistent with these findings, several other quantitative and qualitative studies performed on hypertensive patients also supported this view. High levels of satisfaction with the effectiveness of antihypertensive medications by hypertensive patients indicate that the medications used by patients were perceived as effective in managing hypertension among the patients included in this study. These findings indicate that the currently prescribed antihypertensive medications were adequate. However, patients should consider monitoring their blood pressure, and healthcare providers should consider reviewing the treatment plans for individual hypertensive patients. In addition, healthcare providers might consider personalizing the treatment plan for each individual patient when needed (55-57). Future qualitative studies might consider exploring the reasons why some patients were less satisfied with the effectiveness of antihypertensive medications.

4.4 Low incidence of side effects

In this study, fewer than (10%) of the patients reported that they experienced side effects. The proportion of patients who reported experiencing side effects was lower than that reported in previous studies that were conducted elsewhere (58-60). This low incidence of side effects indicated that the antihypertensive medications used by the patients who participated in this study were appropriately selected and well tolerated. Similarly, the negligible effect of the reported side effects on the overall satisfaction of the hypertensive patients further highlighted that the current treatment plans used for the patients were adequate. However, future studies should consider the best ways to reduce the incidence of some side effects that reportedly occurred among some of the patients who participated in this study. In addition, future studies should consider investigating how antihypertensive medications can improve the quality of life of hypertensive patients in the long term.

4.5 Differences in satisfaction with the treatment between male and female patients

In this study, male patients reported lower convenience scores and a higher incidence of reported adverse effects than female patients did. Although the difference in the incidence of the reported adverse effects was not statistically significant, it could be considered in light of the differences between males and females in terms of their experiences with using medications. Previous studies have reported disparities in the prescription of cardiovascular medications, including antihypertensive medications, between male and female patients (61-64). A systematic review with meta-analysis reported that male patients were less likely to receive diuretics than female patients who received treatment in primary care (61). On the other hand, the same review reported that female patients were less likely to receive angiotensin-converting enzyme inhibitors, statins, and aspirin than male patients were. Different classes of antihypertensive medications have various side effects. Therefore, healthcare providers might consider the sex of hypertensive patients while tailoring counseling and educational materials/sessions about hypertension and antihypertensive medications and their side effects. These tailored sessions might improve patient satisfaction with the treatment, adherence to taking antihypertensive medications, and health outcomes. More studies are needed to understand the reasons behind the differences in patient

satisfaction with treatment and the incidence of side effects among male and female patients.

4.6 The effects of food and drug allergy

In this study, the patients who had documented food/drug allergies reported significantly lower satisfaction with the treatment and a higher incidence of adverse effects. These findings were not surprising, as allergies and intolerances have been previously reported among hypertensive patients (65, 66). These allergies and intolerances are reportedly bothersome to patients, resulting in suboptimal control of blood pressure and reduced adherence to taking antihypertensive medications (65). Together, these findings stress the necessity of taking a comprehensive medication history from patients before they are prescribed certain antihypertensive medications. These findings underscore the importance of clinical pharmacists, who could be instrumental in obtaining detailed medication histories from patients. Healthcare professionals must consider prescribing different antihypertensive drugs to patients suffering from allergies due to certain antihypertensive medications.

4.7 The impact of past medical history and smoking

Patients who had other medical histories and those who were smokers expressed lower satisfaction with the treatment and had a higher incidence of adverse effects. These findings indicate that comorbid diseases and smoking can negatively affect the treatment experiences of hypertensive patients. The findings reported in this study were not surprising, as it is highly likely that patients with comorbidities use other medications that might interact with antihypertensive medications. Hypertension is often accompanied by obesity, diabetes mellitus, hyperlipidemia, a sedentary lifestyle, and smoking. Multiple morbidities are known to increase health risks (67). These findings indicate other roles of the clinical pharmacist in taking the past medical history, the presence of comorbidities, and the recommendation of the best antihypertensive medications that would not interact with the other medications used by the patients. Moreover, personalized treatment plans can increase patient satisfaction with treatment and adherence to antihypertensive medications. Moreover, the results of this study indicate that smoking cessation programs and comprehensive medication reviews can be beneficial for hypertensive patients who are smokers and have other comorbidities.

4.8 The impact of other demographic and disease variables

The results from the study revealed significant connections between some demographic and clinical factors and satisfaction levels regarding treatment. As such, there was a modest positive correlation between age and years since the diagnosis of hypertension. However, there was a poor negative relationship between age on the one hand and the DAI-10 score and convenience score on the other hand. Thus, it can be concluded that older people have problems with their treatments, especially those who have lived with hypertension for a long period of time. These findings are in line with those of previous studies (29, 35, 68). Additionally, the results suggest that aged patients, along with those who have longer periods of hypertension, might require special educational and counseling sessions. These personally designed sessions may lead to an increase in how patients receive treatment, their satisfaction rates and attitudes toward taking drugs among them.

Moreover, patients who were overweight or obese had considerably lower scores on the DAI-10 scale and regarded their antihypertensive medications to be less effective. Additionally, these patients experienced greater levels of side effects, reported that the prescriptions were less convenient, and had lower overall satisfaction scores. These findings indicate that BMI can affect the experiences of patients (68, 69). It is likely that patients who are overweight or obese may suffer differences in the way their bodies process medications, resulting in varying levels of adverse effects and efficacy. These findings highlight the need to include weight control in the overall therapeutic regimen for hypertensive patients. Interventions that prioritize weight loss and lifestyle adjustments have the potential to enhance both treatment satisfaction and health outcomes.

Patients who had undergone previous surgeries had considerably lower ratings for adverse effects than did those who had not undergone any surgeries. This finding is intriguing, as it suggests that people who have undergone surgery may be more resilient or have a distinct tolerance for adverse effects. Alternatively, it may indicate variations in pharmaceutical protocols or posttreatment monitoring. Additional investigations are needed to delve into the causes of this correlation and ascertain the extent to which surgical history influences overall treatment experience. Gaining insight into these

parameters may assist in customizing postoperative care and antihypertensive therapy to optimize patient outcomes.

4.9 The key predictors of positive attitudes and high satisfaction

Multiple linear regression models have revealed important factors that predict treatment satisfaction, such as the duration since diagnosis, the existence of food or medication allergies, BMI, perceived efficacy, side effects, and overall satisfaction ratings. These predictors provide a thorough comprehension of the elements that influence patients' experiences with antihypertensive medicines. The regression analysis highlights the intricate nature of treatment satisfaction and emphasizes the need for a comprehensive approach to patient care. Healthcare practitioners may increase patient happiness and adherence by specifically targeting these factors and implementing appropriate treatments. For example, effectively controlling adverse effects, guaranteeing the efficacy of drugs, and addressing unique patient factors such as allergies and BMI might result in improved treatment results.

4.10 Implications for practice

- The research findings suggest that patients in the examined demographic group typically have a favorable perception of antihypertensive medications, as shown by their high levels of treatment satisfaction and positive attitudes. Clinical pharmacists may significantly enhance favorable attitudes by providing patient counseling and education about the advantages and significance of adherence to prescribed drugs.

- Nevertheless, some subcategories, such as male individuals, patients with allergies or a past medical history, and smokers, may want more support and personalized measures. Clinical pharmacists are optimally situated to deliver personalized assistance, addressing particular issues concerning allergies, medical history, and the influence of smoking on hypertension management, while also customizing medication regimens and counseling to meet the unique requirements of male patients.

- Healthcare practitioners should prioritize enhancing the treatment experiences of hypertensive patients by increasing drug convenience, effectively controlling side effects, and addressing lifestyle issues. Clinical pharmacists can substantially

enhance patient care by streamlining medication regimens for convenience (e.g., once-daily dosing), proactively addressing side effects through medication modifications or recommendations, and delivering thorough lifestyle counseling, encompassing dietary guidance, exercise suggestions, and smoking cessation assistance.

- Ensuring patient education, consistent follow-up, and tailored treatment regimens are essential for encouraging adherence and satisfaction. Clinical pharmacists can spearhead these initiatives by delivering comprehensive medication education, performing regular follow-up consultations to assess progress and resolve issues, and partnering with physicians to formulate and execute customized treatment strategies that enhance both effectiveness and patient satisfaction.

4.11 Implications for future research

- Subsequent investigations should delve into the fundamental processes that are responsible for the observed connections and factors that might predict the level of satisfaction with therapy.

- Longitudinal studies are necessary to evaluate the consistency of these results over time and the enduring effects of antihypertensive medications on patient outcomes.

- Furthermore, intervention studies should assess the efficacy of focused approaches in enhancing treatment experiences for certain patient populations.

- Future research may enhance the effectiveness and personalization of hypertension care, leading to improved patient outcomes and quality of life.

4.12 Strengths of the study

- **Comprehensive data collection:** The use of a well-developed questionnaire allowed the gathering of extensive data pertaining to demographics, clinical variables, antihypertensive medications, and patient perspectives about antihypertensive medications. This comprehensive method offers a comprehensive comprehension of patients' encounters.

- **The use of valid and reliable tools:** The study used validated instruments, namely, the DAI-10 and the TSQM. The use of recognized and tested devices enhances the accuracy and consistency of the gathered data.

- **Assessing the different dimensions of satisfaction:** This study provided a comprehensive analysis of patient satisfaction with antihypertensive medications by examining several aspects, including efficacy, side effects, convenience, and overall satisfaction. This provides a detailed and nuanced view of patient experiences.

- **Primary healthcare settings:** By performing the study at primary healthcare clinics, the research accurately represented the actual environments where the majority of hypertension patients receive medical treatment. This increased the relevance of the results to comparable healthcare settings.

- **Diversity in the patient population:** By including patients from various demographic and clinical backgrounds, including different ages, genders, and medical histories, a comprehensive sample is obtained that encompasses a broad spectrum of experiences and viewpoints.

- **Identification of the key predictors:** This research revealed important factors that strongly influence treatment satisfaction and attitudes, including the duration since diagnosis, the existence of allergens, and BMI. This information is very important for physicians who are striving to enhance patient care and promote adherence.

4.13 Limitations of the study

- **Study design:** The study's cross-sectional design restricts the capacity to demonstrate causal correlations between variables. Longitudinal studies are necessary to establish causation and monitor changes over a period of time.

- **Self-reporting:** The use of self-reported data to evaluate treatment satisfaction and attitudes toward pharmaceuticals might introduce bias, such as memory bias or social desirability bias, which can impact the accuracy of the replies.

- **Limited geographical coverage:** The research conducted in Nablus, West Bank, Palestine, restricts the applicability of the results to other areas. The findings of this

study may be affected by variations in culture, socioeconomic conditions, and healthcare systems if they are to be conducted in various regions.

- **Selection bias:** The inclusion of patients who voluntarily agreed to participate in the research may introduce systemic differences compared with those who declined to participate, resulting in selection bias. This might affect the representativeness of the sample.

- **Lack of measured clinical outcomes:** This research specifically examines patient satisfaction and attitudes but does not establish any connections between these factors and clinical outcomes such as blood pressure management, cardiovascular events, or improvements in quality of life. The study's results could be enhanced by including clinical outcomes.

- **Lack of qualitative data:** This research uses quantitative measures to evaluate satisfaction and attitudes, but it lacks qualitative data that may provide more profound insights into patients' experiences and the underlying causes of their views and satisfaction levels.

4.14 Conclusion

The study assessed the attitudes and satisfaction of hypertensive patients who visited primary healthcare clinics in the Nablus area toward taking antihypertensive medications. The findings of this study revealed positive attitudes toward and high levels of satisfaction with antihypertensive medications among patients, notably regarding the perceived effectiveness and convenience of antihypertensive medications. The time elapsed since diagnosis with hypertension, the presence of documented allergies, and BMI are important factors that can predict negative attitudes and low satisfaction with treatment. Healthcare providers and decision makers should consider measures to improve, maintain, and support positive attitudes and satisfaction with treatment among hypertensive patients.

List of Abbreviations

Abbreviation	Meaning
API	Autonomy Preference Index
BP	Blood pressure
CKD	Chronic kidney disease
DAI-10	Drug Attitude Inventory
DBP	Diastolic blood pressure
HRQOL	Health-related quality of life
K-Wood-MAS-4	Krousel-Wood Medication Adherence Scale
NHANES	National Health and Nutrition Examination Survey
PDC	Percentage of days covered
SBP	Systolic blood pressure
TIPS	Trust in Physician Scale
TSQM	Treatment Satisfaction Questionnaire for Medication
WHOQOL-brief	World Health Organization Quality of Life-brief

References

1. Zeng Z, Chen J, Xiao C, Chen W. A Global View on Prevalence of Hypertension and Human Develop Index. Annals of global health. 2020;86(1):67.

2. Dai H, Bragazzi NL, Younis A, Zhong W, Liu X, Wu J, et al. Worldwide Trends in Prevalence, Mortality, and Disability-Adjusted Life Years for Hypertensive Heart Disease From 1990 to 2017. Hypertension. 2021;77(4):1223-33.

3. Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, et al. Heart Disease and Stroke Statistics-2016 Update: A Report From the American Heart Association. Circulation. 2016;133(4):e38-360.

4. Allison MG, Heil EL, Hayes BD. Appropriate Antibiotic Therapy. Emergency medicine clinics of North America. 2017;35(1):25-42.

5. Kalehoff JP, Oparil S. The Story of the Silent Killer. Current Hypertension Reports. 2020;22(9):72.

6. Lee CJ, Park WJ, Suh J-W, Choi E-K, Jeon DW, Lim S-W, et al. Relationship between health-related quality of life and blood pressure control in patients with uncontrolled hypertension. The Journal of Clinical Hypertension. 2020;22(8):1415-24.

7. Amare F, Hagos B, Sisay M, Molla B. Uncontrolled hypertension in Ethiopia: a systematic review and meta-analysis of institution-based observational studies. BMC Cardiovascular Disorders. 2020;20(1):129.

8. Poulter NR, Borghi C, Parati G, Pathak A, Toli D, Williams B, et al. Medication adherence in hypertension. Journal of Hypertension. 2020;38(4).

9. Hamrahian SM, Maarouf OH, Fülöp T. A Critical Review of Medication Adherence in Hypertension: Barriers and Facilitators Clinicians Should Consider. Patient Preference and Adherence. 2022;16(null):2749-57.

10. Zyoud SeH, Al-Jabi SW, Sweileh WM, Morisky DE. Relationship of treatment satisfaction to medication adherence: findings from a cross-sectional survey among

hypertensive patients in Palestine. Health and Quality of Life Outcomes. 2013;11(1):191.

11. Tesfaye WH, McKercher C, Peterson GM, Castelino RL, Jose M, Zaidi STR, et al. Medication Adherence, Burden and Health-Related Quality of Life in Adults with Predialysis Chronic Kidney Disease: A Prospective Cohort Study. International Journal of Environmental Research and Public Health. 2020;17(1):371.

12. Bu X, Xie Z, Liu J, Wei L, Wang X, Chen M, et al. Global PM2.5-attributable health burden from 1990 to 2017: Estimates from the Global Burden of disease study 2017. Environmental Research. 2021;197:111123.

13. Elnaem MH, Mosaad M, Abdelaziz DH, Mansour NO, Usman A, Elrggal ME, et al. Disparities in Prevalence and Barriers to Hypertension Control: A Systematic Review. International Journal of Environmental Research and Public Health. 2022;19(21):14571.

14. Alpsoy Ş. Exercise and Hypertension. In: Xiao J, editor. Physical Exercise for Human Health. Singapore: Springer Nature Singapore; 2020. p. 153-67.

15. Mills KT, Bundy JD, Kelly TN, Reed JE, Kearney PM, Reynolds K, et al. Global Disparities of Hypertension Prevalence and Control. Circulation. 2016;134(6):441-50.

16. Zhou B, Bentham J, Di Cesare M, Bixby H, Danaei G, Cowan MJ, et al. Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19·1 million participants. The Lancet. 2017;389(10064):37-55.

17. Chow CK, Teo KK, Rangarajan S, Islam S, Gupta R, Avezum A, et al. Prevalence, Awareness, Treatment, and Control of Hypertension in Rural and Urban Communities in High-, Middle-, and Low-Income Countries. JAMA. 2013;310(9):959-68.

18. Association ACoCAH. Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: Synopsis of the 2017 American College of

Cardiology/American Heart Association Hypertension Guideline. Annals of Internal Medicine. 2018;168(5):351-8.

19. Cifu AS, Davis AM. Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. JAMA. 2017;318(21):2132-4.

20. Collaboration PS. Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies. The Lancet. 2002;360(9349):1903-13.

21. Gu D, Kelly TN, Wu X, Chen J, Duan X, Huang J-F, et al. Blood Pressure and Risk of Cardiovascular Disease in Chinese Men and Women. American Journal of Hypertension. 2008;21(3):265-72.

22. Lewington S, Clarke R, Qizilbash N, Peto R, Collins R. Age-specific relevance of usual blood pressure to vascular mortality. The Lancet. 2003;361(9366):1391-2.

23. Anderson AH, Yang W, Townsend RR, Pan Q, Chertow GM, Kusek JW, et al. Time-updated systolic blood pressure and the progression of chronic kidney disease: a cohort study. Ann Intern Med. 2015;162(4):258-65.

24. Turnbull F, Woodward M, Neal B, Barzi F, Ninomiya T, Chalmers J, et al. Do men and women respond differently to blood pressure-lowering treatment? Results of prospectively designed overviews of randomized trials. European heart journal. 2008;29(21):2669-80.

25. Klag MJ, Whelton PK, Randall BL, Neaton JD, Brancati FL, Stamler J. End-stage Renal Disease in African-American and White Men: 16-Year MRFIT Findings. JAMA. 1997;277(16):1293-8.

26. Dorans KS, Mills KT, Liu Y, He J. Trends in Prevalence and Control of Hypertension According to the 2017 American College of Cardiology/American Heart Association (ACC/AHA) Guideline. Journal of the American Heart Association. 2018;7(11):e008888.

27. Mills KT, Stefanescu A, He J. The global epidemiology of hypertension. Nature Reviews Nephrology. 2020;16(4):223-37.

28. Gaziano TA, Bitton A, Anand S, Weinstein MC, for the International Society of H. The global cost of nonoptimal blood pressure. Journal of Hypertension. 2009;27(7).

29. Shrestha J, Marasine NR, Lamichhane R, Marasini NR, Sankhi S. Attitude and self-care practice on hypertension among antihypertensive medication users in a tertiary care hospital Nepal. SAGE Open Medicine. 2021;9:20503121211040707.

30. Craig LS, Peacock E, Mohundro BL, Silver JH, Marsh J, Johnson TC, et al. Implicit and Explicit Attitudes Toward Antihypertensive Medications Explain Variation in Pharmacy Refill and Self-Reported Adherence Beyond Traditional Risk Factors: Potential Novel Mechanism Underlying Adherence. Journal of the American Heart Association. 2021;10(6):e018986.

31. Perret-Guillaume C, Genet C, Herrmann FR, Benetos A, Hurst SA, Vischer UM. Attitudes and Approaches to Decision Making About Antihypertensive Treatment in Elderly Patients. Journal of the American Medical Directors Association. 2011;12(2):121-8.

32. Hultgren F, Jonasson G, Billhult A. From resistance to rescue – patients' shifting attitudes to antihypertensives: A qualitative study. Scandinavian Journal of Primary Health Care. 2014;32(4):163-9.

33. Malkon S, Wettermark B, Kahan T, Bastholm-Rahmner P, Hasselström J, Qvarnström M. A Qualitative Study on Patients' Views on Hypertension and Antihypertensive Medications. Patient Preference and Adherence. 2023;17(null):3331-9.

34. Jokisalo E, Kumpusalo E, Enlund H, Takala J. Patients' perceived problems with hypertension and attitudes towards medical treatment. Journal of Human Hypertension. 2001;15(11):755-61.

35. Ralapanawa U, Bopeththa K, Wickramasurendra N, Tennakoon S. Hypertension Knowledge, Attitude, and Practice in Adult Hypertensive Patients at a Tertiary Care Hospital in Sri Lanka. International Journal of Hypertension. 2020;2020(1):4642704.

36. Rashidi Y, Manaflouyan H, Pournaghi Azar F, Nikniaz Z, Nikniaz L, Ghaffari S. Knowledge, attitude and practice of Iranian hypertensive patients regarding hypertension. Journal of cardiovascular and thoracic research. 2018;10(1):14-9.

37. Ajayi DT, Adedokun BO, Owoeye DO, Akpa OM. Treatment Satisfaction and Medication Adherence Among Hypertensive Patients Seeking Care in Selected Hospitals in Ibadan, Nigeria. Archives of basic and applied medicine. 2018;6(1):67-72.

38. Kato H, Shiraishi T, Ueda S, Kubo E, Shima T, Nagura M, et al. Blood pressure control and satisfaction of hypertensive patients following a switch to combined drugs of an angiotensin receptor blocker and a calcium channel blocker in clinical practice of nephrology. Clinical and Experimental Nephrology. 2015;19(3):465-73.

39. Croog SH, Levine S, Testa MA, Brown B, Bulpitt CJ, Jenkins CD, et al. The Effects of Antihypertensive Therapy on the Quality of Life. New England Journal of Medicine. 1986;314(26):1657-64.

40. Oluwole EO, Osibogun O, Adegoke O, Adejimi AA, Adewole AM, Osibogun A. Medication Adherence and Patient Satisfaction among Hypertensive Patients Attending Outpatient Clinic in Lagos University Teaching Hospital, Nigeria. Nigerian Postgraduate Medical Journal. 2019;26(2).

41. Lo SHS, Chau JPC, Woo J, Thompson DR, Choi KC. Adherence to Antihypertensive Medication in Older Adults With Hypertension. Journal of Cardiovascular Nursing. 2016;31(4).

42. Glasser SP. Antihypertensive safety and efficacy and physician and patient satisfaction: results from a phase 4 practice-based clinical experience trial with diltiazem LA. Advances in Therapy. 2006;23(2):284-94.

43. Jneid S, Jabbour H, Hajj A, Sarkis A, Licha H, Hallit S, et al. Quality of Life and Its Association With Treatment Satisfaction, Adherence to Medication, and Trust in Physician Among Patients With Hypertension: A Cross-Sectional Designed Study. Journal of Cardiovascular Pharmacology and Therapeutics. 2018;23(6):532-42.

44. Saarti S, Hajj A, Karam L, Jabbour H, Sarkis A, El Osta N, et al. Association between adherence, treatment satisfaction and illness perception in hypertensive patients. Journal of Human Hypertension. 2016;30(5):341-5.

45. Bharmal M, Payne K, Atkinson MJ, Desrosiers M-P, Morisky DE, Gemmen E. Validation of an abbreviated Treatment Satisfaction Questionnaire for Medication (TSQM-9) among patients on antihypertensive medications. Health and Quality of Life Outcomes. 2009;7(1):36.

46. Kong FZ, Ji CF, Du XD, Logan R, Zhao HY, Wu GH, et al. Baseline beliefs about medication are associated with outcomes of antidepressants in inpatients with first-diagnosed depression under supervised therapeutic compliance. Aging. 2021;13(17):21400-7.

47. Broekman M, Coenen MJH, Wanten GJ, van Marrewijk CJ, Kievit W, Klungel OH, et al. Patients' beliefs about medicine are associated with early thiopurine discontinuation in patients with inflammatory bowel diseases. European journal of gastroenterology & hepatology. 2018;30(2):167-73.

48. . !!! INVALID CITATION !!!

49. Hogan TP, Awad A, Eastwood R. A self-report scale predictive of drug compliance in schizophrenics: reliability and discriminative validity. Psychological medicine. 1983;13(1):177-83.

50. Pomykacz B, Mao M, Roger RD, Teter CJ. A Review of Brief Medication-Adherence Instruments Used in Patients with Schizophrenia and Bipolar Disorder. Harvard Review of Psychiatry. 2007;15(5).

51. Liberato ACS, São João TM, Jannuzzi FF, Landaas EJ, Wongchareon K, Rodrigues RCM. Treatment Satisfaction Questionnaire for Medication (TSQM version 1.4): Ceiling and Floor Effects, Reliability, and Known-Group Validity in Brazilian Outpatients With Hypertension. Value in Health Regional Issues. 2020;23:150-6.

52. Karakurt P, Kaşikçi M. Factors affecting medication adherence in patients with hypertension. Journal of vascular nursing. 2012;30(4):118-26.

53. Qvarnström M, Kahan T, Kieler H, Brandt L, Hasselström J, Wettermark B. Medication persistence to antihypertensive drug treatment – a cross-sectional study of attitudes towards hypertension and medication in persistent and non-persistent patients. Blood Pressure. 2019;28(5):309-16.

54. Saleem F, Hassali MA, Shafie AA, Atif M. Drug Attitude and Adherence: A Qualitative Insight of Patients with Hypertension. Journal of Young Pharmacists. 2012;4(2):101-7.

55. Xiao ZL, Yang M, Chen XB, Xie XM, Chen MF. Personalized antihypertensive treatment guided by pharmacogenomics in China. Cardiovascular diagnosis and therapy. 2022;12(5):635-45.

56. Carey RM. Is Personalized Antihypertensive Drug Selection Feasible? JAMA. 2023;329(14):1153-4.

57. Muselli M, Bocale R, Necozione S, Desideri G. Is the response to antihypertensive drugs heterogeneous? Rationale for personalized approach. European Heart Journal Supplements. 2024;26(Supplement_1):i60-i3.

58. Choi H, Hall C. Chapter 8 - Antihypertensive drugs. In: Ray SD, editor. Side Effects of Drugs Annual. 44: Elsevier; 2022. p. 111-20.

59. Yang W, Luo H, Ma Y, Si S, Zhao H. Effects of Antihypertensive Drugs on Cognitive Function in Elderly Patients with Hypertension: A Review. Aging and disease. 2021;12(3):841-51.

60. Piskorz D. Hypertensive Mediated Organ Damage and Hypertension Management. How to Assess Beneficial Effects of Antihypertensive Treatments? High Blood Pressure & Cardiovascular Prevention. 2020;27(1):9-17.

61. Zhao M, Woodward M, Vaartjes I, Millett ERC, Klipstein-Grobusch K, Hyun K, et al. Sex Differences in Cardiovascular Medication Prescription in Primary Care: A Systematic Review and Meta-Analysis. Journal of the American Heart Association. 2020;9(11):e014742.

62. Connelly PJ, Currie G, Delles C. Sex Differences in the Prevalence, Outcomes and Management of Hypertension. Current Hypertension Reports. 2022;24(6):185-92.

63. Song J-J, Ma Z, Wang J, Chen L-X, Zhong J-C. Gender Differences in Hypertension. Journal of Cardiovascular Translational Research. 2020;13(1):47-54.

64. Kalibala J, Pechere-Bertschi A, Desmeules J. Gender differences in cardiovascular pharmacotherapy—the example of hypertension: a mini review. Frontiers in pharmacology. 2020;11:564.

65. Palermiti A, Pappaccogli M, Rabbia F, D'Avolio A, Veglio F. Multiple drug intolerance in antihypertensive patients: what is known and what is missing. Journal of Hypertension. 2024;42(8).

66. Felkle D, Jarczyński M, Kaleta K, Zięba K, Nazimek K. The immunomodulatory effects of antihypertensive therapy: A review. Biomedicine & Pharmacotherapy. 2022;153:113287.

67. Sheppard JP, Tucker KL, Davison WJ, Stevens R, Aekplakorn W, Bosworth HB, et al. Self-monitoring of Blood Pressure in Patients With Hypertension-Related Multimorbidity: Systematic Review and Individual Patient Data Meta-analysis. American Journal of Hypertension. 2020;33(3):243-51.

68. Verulava T, Mikiashvili G. Knowledge, awareness, attitude and medication compliance in patients with hypertension. Arterial Hypertension. 2021;25(3):119-26.

69. Kurnia AD, Melizza N, Ruhyanudin F, Masruroh NL, Prasetyo YB, Setyowati CI, et al. The Effect of Educational Program on Hypertension Management Toward Knowledge and Attitude Among Uncontrolled Hypertension Patients in Rural Area of Indonesia. Community Health Equity Research & Policy. 2022;42(2):181-8.

Appendices

Appendix A

Institutional Review Board Approval

An-Najah National University
Faculty of Medicine & Health Sciences
Institutional Review Board

جامعة النجاح الوطنية
كلية الطب وعلوم الصحة
لجنة اخلاقيات البحث العلمي

Ref: Mas. Dec. 2022/16

IRB Approval Letter

Title of Research:

Treatment satisfaction and attitudes toward taking medications among hypertensive patients: a cross-sectional study from Palestine

Submitted by:
Kareman Yaseen

Supervisore:

Sae'd Zyoud, Samah Al-Jabi

Approved:
27th Dec. 2022

Your Study Title "**Treatment satisfaction and attitudes toward taking medications among hypertensive patients: a cross-sectional study from Palestine..**" reviewed by An-Najah National University IRB committee and was approved on. 27th Dec. 2022.

Hasan Fitian, MD

IRB Committee Chairman

IRB Institutional Review Board

Nablus - P.O Box :7 or 707 | Tel (970) (09) 2342902/4/7/8/14 | Faximile (970) (09) 2342910| E-mail : IRB@najah.edu

Appendix B

Data Collection Form

Socio-demographic and clinical data

Patient Information					
Date of Birth	____ / _____ / _____ AGE: _____				
Gender	○ Male ○ Female				
Marital Status	○ Single ○ Married ○ Divorced ○ Widowed				
Height	**_____ cm**				
Weight	**_____ Kg**				
BMI	**_____ Kg/m^2**				
Smoking	○ No ○ Yes ○ Ex-smoker				
City					
Village					
Past Medical History					
ALLERGY	○ None ○ Allergic to _____				
DISEASE HISTORY	○ None	☐ Diabetes	☐Osteoporosis	☐Dyslipidemia	☐ BPH
	☐ Asthma	☐COPD	☐L. Cirrhosis	☐ IBS	☐IHD
	☐ R. Arthritis	☐ Osteoarthritis	☐ Gout		
	☐Others: _____				

	_____
Hypertension	Diagnosis date: How were diagnosed?
Medication History	
Home Medications (Drug, Dose, Route, Frequency)	

Drug Attitudes Inventory (DAI-10)

Item	True	False
For me, the good things about medication outweigh the bad		
I feel uncomfortable on medication.		
I take medications of my own choice.		
Medications make me feel more relaxed.		
Medication makes me feel tired and sluggish.		
I take medication only when I am sick.		
I feel more normal on medication.		
It is unnatural for my mind and body to be controlled by medications.		
My thoughts are clearer on medication.		
By staying on medications, I can prevent getting sick		

TSQM 1.4

استبانة حول الرضا عن المعالجة بالدواء

الإرشادات: نرجو تخصيص بعض الوقت للتفكير بمستوى رضاك أو عدم رضاك عن الدواء الذي تتناوله في هذه التجربة الطبية. يهمنا معرفة تقييمك لفعالية الدواء وأعراضه الجانبية ومدى سهولة استخدامه على مدى فترة الأسبوعين إلى الثلاثة أسابيع الماضية، أو منذ المرة الأخيرة التي استخدمته فيها. لكل سؤال، الرجاء وضع علامة صح بجانب الإجابة الأكثر تعبيراً عن تجربتك الخاصة مع الدواء.

1. ما مدى رضاك أو عدم رضاك عن قدرة الدواء على الوقاية من حالتك المرضية أو على علاجها؟

1) غير راضٍ الى أقصى الحدود
2) غير راضٍ جداً
3) غير راضٍ
4) راضٍ الى حد ما
5) راضٍ
6) راضٍ جداً
7) راضٍ الى أقصى الحدود

2. ما مدى رضاك أو عدم رضاك عن طريقة تخفيف الدواء للأعراض التي تعاني منها؟

1) غير راضٍ الى أقصى الحدود
2) غير راضٍ جداً
3) غير راضٍ
4) راضٍ الى حد ما
5) راضٍ
6) راضٍ جداً
7) راضٍ الى أقصى الحدود

3. ما مدى رضاك أو عدم رضاك عن الفترة الزمنية التي يستغرقها الدواء ليبدأ مفعوله؟

1) غير راضٍ الى أقصى الحدود

2) غير راضٍ جداً

3) غير راضٍ

4) راضٍ الى حد ما

5) راضٍ

6) راضٍ جداً

7) راضٍ الى أقصى الحدود

4. هل تعاني من أية أعراض جانبية نتيجة لتناولك الدواء؟

1) نعم

2) لا

(إن كانت إجابتك لا، فالرجاء الإنتقال إلى السؤال رقم 9)

5. ما مدى تضايقك من الأعراض الجانبية للدواء الذي تتناوله لعلاج حالتك؟

1) متضايق لأقصى الحدود

2) متضايق جداً

3) متضايق إلى حد ما

4) متضايق قليلاً

5) غير متضايق بتاتاً

6. إلى أي درجة تؤثر الأعراض الجانبية على صحتك البدنية وقدراتك الجسدية (أي القوة ومستويات الطاقة ... إلخ)؟

1) إلى حد كبير

2) إلى حد ملحوظ

3) بعض الشيء

4) إلى حد ضئيل

5) أبداً

7. إلى أي درجة تؤثر الأعراض الجانبية على قدرتك <u>العقلية</u> (أي القدرة على التفكير بصفاء والبقاء مستيقظاً ... إلخ)؟

1) إلى حد كبير

2) إلى حد ملحوظ

3) بعض الشيء

4) إلى حد ضئيل

5) أبداً

8. إلى أية درجة أثرت الأعراض الجانبية للدواء على رضاك العام عنه؟

1) إلى حد كبير

2) إلى حد ملحوظ

3) بعض الشيء

4) إلى حد ضئيل

5) أبداً

9. ما مدى سهولة أو صعوبة إستخدام الدواء بشكله الحالي؟

1) صعب الى أقصى الحدود

2) صعب جداً

3) صعب

4) سهل بعض الشيء

5) سهل

6) سهل جداً

7) سهل إلى أقصى الحدود

10. ما مدى سهولة أو صعوبة تنظيم الوقت لإستخدام الدواء في كل مرة؟

1) صعب إلى أقصى الحدود

2) صعب جداً

3) صعب

4) سهل إلى حد ما

5) سهل

6) سهل جداً

7) سهل إلى أقصى الحدود

11. ما مدى مناسبة أو عدم مناسبة تناول الدواء حسب الإرشادات؟

1) غير مناسب بتاتاً

2) غير مناسب جداً

3) غير مناسب

4) مناسب إلى حد ما

5) مناسب

6) مناسب جداً

7) مناسب إلى أقصى الحدود

12. بشكل عام، إلى أي حد أنت واثق من أن تناول هذا الدواء مفيدٌ لك؟

1) غير متأكد بتاتاً

2) متأكد قليلاً

3) متأكد إلى حد ما

4) متأكد جداً

5) متأكد إلى أقصى الحدود

13. إلى أي حد أنت متأكد من أن إيجابيات الدواء الذي تتناوله تفوق سلبياته؟

1) غير متأكد بتاتاً

2) متأكد قليلاً

3) متأكد إلى حد ما

4) متأكد جداً

5) متأكد إلى أقصى الحدود

14. إذا أخذنا جميع الأمور بعين الإعتبار، ما مدى رضاك أو عدم رضاك عن هذا الدواء؟

1) غير راضٍ الى أقصى الحدود

2) غير راضٍ جداً

3) غير راضٍ

4) راضٍ الى حد ما

5) راضٍ

6) راضٍ جداً

7) راضٍ الى أقصى الحدود

جـامعـــة النجاح الوطنية

كليـــة الدراســـات العليـــا

الرضا عن العلاج والمواقف تجاه تناول الأدوية لدى مرضى ارتفاع ضغط الدم: دراسة مقطعية من فلسطين

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إشراف

أ.د. سائد زيود

أ.د. سماح الجابي

قدمت هذه الرسالة استكمالا لمتطلبات الحصول على درجة الماجستير في الصيدلة السريرية، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس– فلسطين.

2025

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الملخص

خلفية الدراسة: في جميع أنحاء العالم ، يعيش ملايين المرضى مع ارتفاع ضغط الدم. تهدف هذه الدراسة إلى تقييم مواقف مرضى ارتفاع ضغط الدم تجاه تناول الأدوية الخافضة للضغط ورضاهم عن العلاج.

منهجية الدراسة: أجريت هذه الدراسة في تصميم مقطعي باستخدام استبيان كأداة للدراسة. أجريت هذه الدراسة في مراكز الرعاية الصحية الأولية التابعة لوزارة الصحة في نابلس، الضفة الغربية، فلسطين. بالإضافة إلى المتغيرات الديموغرافية والسريرية ، احتوى الاستبيان أيضا على جرد الموقف الدوائي (DAI-10) والنسخة العربية من استبيان الرضا عن العلاج للأدوية (TSQM).

نتائج الدراسة: في هذه الدراسة ، تم تضمين ما مجموعه 356 مريضا يعانون من ارتفاع ضغط الدم. كان أكثر من نصف المرضى (57.6%، ن = 205) يتناولون أملوديبين. بالإضافة إلى ذلك، تم استخدام فالسارتان من قبل 117 (32.9%) من المرضى. اعتقدت الغالبية العظمى من المرضى (95.2%) أنهم استفادوا من الأدوية الخافضة للضغط وفي رأيهم أن فوائد الأدوية الخافضة للضغط تفوق العيوب. ذكر غالبية المرضى أنهم راضون عن فعالية الأدوية الخافضة للضغط. من بين المرضى، كان (59.6%) راضين جدا و (23.3%) راضين عن قدرة الأدوية الخافضة للضغط على علاج حالة المرض. تأثرت درجات DAI-10 بالوقت منذ التشخيص ($p = 0.004$) ، ووجود حساسية موثقة للطعام أو الدواء ($p <$

0.001)، ومؤشر كتلة الجسم (p = 0.004)، والفعالية المتصورة لدرجات الأدوية الخافضة للضغط (p = 0.010)، ودرجات الآثار الجانبية (p = 0.001) ، ودرجات الراحة (p = 0.040) ، ودرجات الرضا العالمية (p < 0.001). تأثرت الفعالية المتصورة لدرجات الأدوية الخافضة للضغط بدرجات الآثار الجانبية (p = 0.002)، ودرجات الراحة (p < 0.001) ، ودرجات الرضا العالمية (p < 0.001). تأثرت درجات الرضا العالمية بالوقت منذ التشخيص (p = 0.008)، ودرجات DAI-10 (p < 0.001)، والفعالية المتصورة لدرجات الأدوية الخافضة للضغط (p < 0.001)، ودرجات الآثار الجانبية (p < 0.001).

إستنتاجات الدراسة: كشفت نتائج هذه الدراسة عن مواقف إيجابية ومستويات عالية من الرضا عن الأدوية الخافضة للضغط بين المرضى، لا سيما تجاه الفعالية المتصورة والراحة للأدوية الخافضة للضغط. كان الوقت المنقضي منذ تشخيص ارتفاع ضغط الدم، ووجود الحساسية الموثقة، ومؤشر كتلة الجسم من العوامل المهمة التي يمكن أن تتنبأ بالمواقف السلبية وانخفاض الرضا عن العلاج. يجب على مقدمي الرعاية الصحية وصناع القرار النظر في اتخاذ تدابير لتحسين المواقف الإيجابية والحفاظ عليها ودعمها والرضا عن العلاج بين مرضى ارتفاع ضغط الدم.

الكلمات المفتاحية: المواقف، الرضا، ارتفاع ضغط الدم، الأدوية الخافضة للضغط، العلاج، أمراض القلب والأوعية الدموية، الرعاية الصحية الأولية.