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Assessment of Hypertension Awareness, Treatment, and Control Among Adults in Primary Care: A Cross-Sectional Analysis

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ABSTRACT

Background:

Primary care practitioners show poor results in managing hypertension because this modifiable cardiovascular disease risk factor remains unidentified and its treatment remains insufficient for most patients. The need for local health interventions depends heavily on determining awareness rates in addition to treatment status and blood pressure control levels.

Objectives:

the study was designed to assess hypertension awareness and treatment and blood pressure control in primary care center patients while identifying social characteristics and medical factors influencing these results.

Methods:

This research conducted a cross-sectional study among 126 adult patients who received hypertension diagnoses from the King Faisal University polyclinic in Saudi Arabia. The research relied on structured interview combined with clinical measurements coupled with patient record examination. The researchers employed descriptive statistics together with chi-square tests and logistic regression analysis for their assessment.

Results:

Research showed that 72.2% of the participants knew their hypertensive status along with 58.7% who received anti-hypertensive medication. The percentage of individuals receiving antihypertensive treatment with controlled blood pressure stood at 41.9%. People with higher education levels, marital status and diabetes comorbidity demonstrated better outcomes regarding their awareness and treatment for hypertension. Blood pressure control showed a strong association with regular physical activity according to findings of analysis (AOR=2.31; p=0.018).

Conclusion:

Primary care hypertensive patients display moderate awareness followed by treatment rates yet their blood pressure control rates remain insufficient. Intervention strategies should focus on lifestyle changes and patient education and screenings to reduce hypertension care gaps throughout Saudi Arabia.

Keywords:

Hypertension, Awareness, Treatment, Blood Pressure Control, Primary Care, Saudi Arabia, Chronic Disease Management

Introduction

Elevated blood pressure serves as a major disease burden contributor worldwide because it creates substantial cardiovascular health problems that result in numerous fatal outcomes throughout the globe. An estimated 1.28 billion adults between 30–79 years of age have hypertension based on World Health Organization statistics and two-thirds of these individuals live within low- and middle-income countries (LMICs) (1). Such a condition poses a major public health challenge that results in poor health system performance and diminished population wellness because effective treatments exist but patients fail to receive proper diagnoses or sustainable treatment control (2,3).

Hypertension management at its early stages becomes vital for stopping cardiovascular diseases that could cause heart attacks or heart failure or strokes. Insufficient research shows that minor blood pressure reduction leads to significant cardiovascular risk reduction (4). The three connected areas of hypertension control success depend on awareness, treatment and control. Users unfold their hypertension diagnosis through the knowledge acquired from a medical professional about their blood pressure condition. A person receives treatment for elevated blood pressure through medications and non-medical strategies and achieves control of the condition when blood pressure reaches proper clinical levels (5).

Various national alongside global initiatives throughout the past twenty years have worked to promote hypertension screening and control attempts. Global HEARTS technical package from WHO and May Measurement Month have promoted better screening practices and healthcare policy development in various areas of the world (6,7). The rates of hypertension awareness and treatment and control remain extremely low especially within primary care facilities serving as patients' first healthcare establishment. Hospitals across numerous Low-to-Middle-Income Countries which include nations in the Middle East struggle to manage hypertension due to service disconnections and insufficient resources along with irregular follow-ups (8,9).

The burden of hypertension along with its management processes have been measured through various research studies. The worldwide rates of hypertension control indicate that 46.5% of affected people know their condition while 36.9% receive treatment and only 13.8% achieve proper blood pressure control according to a systematic review by Mills et al. (10). The highest disparities in hypertension care and management existed in sub-Saharan Africa and South Asia. Nations that invested in comprehensive primary healthcare networks like Canada and the United Kingdom demonstrated better hypertension awareness and control statistics because of their systematic health system policies and public spending (11). The existing data reveals an urgent requirement to create regional-specific information that supports intervention planning specifically for regions that receive limited attention.

Research shows the MENA region experienced a growing hypertension problem because of population dynamics together with urbanization and dietary changes beside physical inactivity and increasing occurrences of obesity and diabetes (12). Saudi Arabia experienced significant hypertension prevalence growth during the last two decades which resulted in 25 percent adult population having hypertension (13). Evidence indicates that primary healthcare service users demonstrate poor levels of hypertension awareness and control according to research findings (14). The present patterns show Healthcare providers are failing to capture opportunities to screen and educate patients while managing disease conditions that lead to hypertension.

The primary care environment presents an ideal situation for detecting and treating hypertension among patients. These establishments serve two important functions: accessibility in addition to delivering continuous supportive care that combines disease prevention services with health promotion and chronic disease management

capabilities (15). The potential advantages of primary care settings fail to eliminate existing gaps in the system for assessing blood pressure indicators among these populations. The combination of limited health provider time and inconsistent guideline adherence and low patient health literacy leads to inadequate hypertension diagnosis and follow-up procedures (16,17). Empirical investigations that take place in primary care locations serve as critical components for discovering actual-care barriers which help build policies to connect these gaps.

This research reinforces existing knowledge about frontline healthcare's vital position regarding non-communicable disease control through its examination of primary care patient groups. This study supports global initiatives for Universal Health Coverage and Sustainable Development Goal target 3.4 because it aims to reduce non-communicable disease-related premature mortality by 2030 via prevention and treatment interventions (18). The research will provide knowledge to guide healthcare practices and policy development which leads to improved targeted resource management and intervention planning for local populations.

Thus the current study aims to investigates awareness rates and treatment practices and control status of hypertension within the adult patient population in primary care facilities

Methods

Study Design

The research employed a descriptive cross-sectional method to measure hypertension awareness together with treatment and control status among medical service patients who are adults. A cross-sectional design selection happened because it efficiently records an instant view of research phenomena among specific populations. This design helped researchers establish the basic understanding of hypertension care status by observing relationships between demographic factors with hypertension outcomes in the study area while preserving the natural conditions.

Study Setting

The study took place in the King Faisal University (KFU) polyclinic_ spread across the Saudi Arabian city of Al-Ahsa where population and disease patterns are currently undergoing substantial changes. The King Faisal University polyclinics deliver medical services to diverse individuals including faculty members and students together with residents of the surrounding area through their open-door approach to outpatient care. The integrative continuous approach of the clinics allows evaluation of chronic disease management including hypertension since they are operated by general practitioners and family medicine consultants together with nurses and allied healthcare providers.

Sample and Sampling Strategy

During the investigation period all adult patients (18 years and older) who visited the KFU polyclinic_ made up the study population. This study recruited 126 participants by employing convenience sampling as one of the non-probability techniques suitable for cross-sectional healthcare research. For study participation participants needed to present either diabetes medical records documenting hypertension diagnosis or self-report their hypertension condition along with willingness to engage and signing informed consent. The study excluded patients with cognitive disorders together with patients who had communication problems preventing survey completion and those who needed urgent medical care. (Inclusion and exclusion criteria need correction and paraphrasing)

Additionally the researcher determined convenience sampling was suitable because of practical hurdles and the study served an exploratory function. Research teams implemented approaches to attract participants who belonged to different age ranges and both sexes to strengthen the demographic quality of the recruited sample..

Data Collection Tools

The researcher developed their questionnaire

through a review of existing valid tools from similar epidemiological studies about hypertension awareness treatment and control. Then they used this tool for interviewer-guided data collection. The survey included five different sections.:

1. **Sociodemographic information**: age, sex, marital status, education level, employment status, and income.
2. **Medical history and risk factors**: duration of hypertension, family history, presence of comorbidities (e.g., diabetes, dyslipidemia), smoking status, and physical activity.
3. **Awareness and knowledge of hypertension**: self-reported diagnosis, understanding of target blood pressure levels, and familiarity with hypertension complications.
4. **Treatment adherence and patterns**: current use of antihypertensive medications, medication adherence (self-reported), non-pharmacologic measures (diet, exercise), and sources of health information.
5. **Blood pressure measurements**: systolic and diastolic readings were recorded using a standardized procedure, detailed below.

The questionnaire started in English before receiving an Arabic version following dual translation by bilingual specialists for maintaining linguistic along with conceptual equivalence. The questionnaire underwent testing among 10 patients who were excluded from the main study for optimizing the questions and measuring the completion duration..

Data Collection Procedure

The data collection period spanned two months during January and February in 2024. Research assistants who received specific training approached the eligible patients after they had completed triage at the primary care clinic. The study description received clear explanation to participants followed by written consent acquisition. The participants completed the questionnaire by using face-to-face interview techniques within private consultation spaces to achieve confidentiality and decrease bias in their responses.

Registered nurses conducted blood pressure measurements with Omron HEM-7120 automated sphygmomanometer after the instrument received calibration. The researcher followed international guidelines throughout the blood pressure measurements where participants needed to sit comfortably before measurements while positioning the cuff on their right upper arm at heart level. Two separate blood pressure readings were taken with a five-minute interval after which researcher calculated an average value from both counts. The researcher determined blood pressure control through American Heart Association guidelines by establishing controlled hypertension as systolic BP less than 140 mmHg combined with diastolic BP less than 90 mmHg for most adults.

Data Analysis

The researcher used IBM SPSS Statistics version 26 to clean and analyze the entered data. Participant characteristics with study variables underwent description through statistical methods. The study analyzed categorical data through frequencies and percentages but displayed continuous data as means with standard deviations together with age and blood pressure readings.
The analysts performed inferential methods to establish any correlations between demographic variables and management measures of hypertension. The statistical methods included Chi-square tests for categorical comparisons together with independent t-tests or ANOVA for continuous variables depending on appropriateness. The study used a binary logistic regression model to determine risk factors of hypertension awareness and blood pressure control seeking p-values below 0.05.

Ethical Considerations

This research respected all ethical principles outlined in the Declaration of Helsinki. Each study participant received information regarding the study purpose along with description of procedures along with potential benefits and identified risks. Each participant provided written consent for study participation before beginning while researchers also guaranteed them full confidentiality to stop their involvement whenever

desired.
Research data anonymity activation occurred during data entry and the storage operations occurred on protected computers which had restricted access to study team members only. Research team members excluded personal information from data collection documents. The researchers will disclose study results through aggregated data which prevents anybody from identifying individual participants.

Results

The research included 126 individuals diagnosed with hypertension for examination. The study participants averaged 52.3 years in age with 11.9 years of age variation and had a slight male predominance. During the study visit, research participants indicated diagnosis knowledge to the healthcare provider at 72.2% and current antihypertensive treatment at 58.7%. The blood pressure control rate among treated patients reached 41.9% using systolic <140 mmHg and diastolic <90 mmHg as the control criteria. The research paper provides detailed information about demographics and hypertension recognition along with treatment status and blood pressure control factors through the presented tables.
The sociodemographic distribution for the 126 hypertensive patients can be found in Table 1. The study offers age data through standard deviation of the mean along with reporting frequencies and percentages of sex and educational level and marital status information. The study participants consisted of mainly male subjects who represented 54.8% of the total while 38.9% of respondents earned a tertiary education degree. Two-thirds of the participants were married showing the common demographic pattern among adult patients at this facility.

Table 1. Sociodemographic Characteristics of the Study Participants

Variable	Category	n	%
Age (years)	Mean ± SD	52.3 ± 11.9	–
Sex	Male	69	54.8
	Female	57	45.2
Education Level	Primary	19	15.1
	Secondary	35	27.8
	Tertiary	49	38.9
	Postgraduate	23	18.3
Marital Status	Single	27	21.4
	Married	83	65.9
	Divorced	16	12.7
Monthly Income (SAR)	<3700	28	22.2
	3700–7399	35	27.8
	7400–11099	40	31.7
	≥11100	23	18.3

The table shows awareness data combined with treatment status and hypertension management results as the main outcomes. The survey categorized participants as “aware” depending on their previous medical diagnosis of hypertension. The criteria for being "treated" involved using any hypertension drugs at present while "controlled" status required that treated patients maintained systolic below 140 mmHg along with diastolic below 90 mmHg. Most participants within the sample group (72.2%) demonstrated knowledge of their hypertension condition. The treatment rate reached 58.7% and blood pressure control remained low among medication users.

Table 2. Overall Hypertension Awareness, Treatment, and Control Status

Indicator	Definition	n	%
Aware	Self-reported previous medical diagnosis	91	72.2
Not Aware	No prior diagnosis	35	27.8
On Treatment	Receiving any antihypertensive medication	74	58.7
Not on Treatment	Diagnosed, but not currently on medication	52	41.3
Controlled	Among treated: Systolic <140 mmHg and Diastolic <90 mmHg	31	41.9
Not Controlled	Among treated: Systolic ≥140 mmHg or Diastolic ≥90 mmHg	43	58.1

Note: The denominator for control status is the 74 individuals receiving treatment.

Comment on Table 3

Table 3 analyzes the connection between essential sociodemographic variables and hypertension awareness rates. Statistical tests using Chi-square showed significant statistical differences between hypertension awareness and both education level (p = 0.018) and marital status (p = 0.037). Workers with tertiary education and married individuals tended to have better knowledge of their health condition because they receive more medical information through their educational and marital status.

Table 3. Hypertension Awareness by Selected Sociodemographic Factors

Variable	Category	Aware (n=91)	Not Aware (n=35)	p-value
Sex	Male (n=69)	48 (69.6)	21 (30.4)	0.312
	Female (n=57)	43 (75.4)	14 (24.6)	
Education Level	Primary (n=19)	10 (52.6)	9 (47.4)	0.018
	Secondary (n=35)	25 (71.4)	10 (28.6)	
	Tertiary (n=49)	40 (81.6)	9 (18.4)	
	Postgrad (n=23)	16 (69.6)	7 (30.4)	
Marital Status	Single (n=27)	15 (55.6)	12 (44.4)	0.037
	Married (n=83)	64 (77.1)	19 (22.9)	
	Divorced (n=16)	12 (75.0)	4 (25.0)	

Values are presented as frequency (% within each row).

Table 4 demonstrates the way treatment distributions relate to diabetes and dyslipidemia and lifestyle characteristics of smoking and physical activity among patients. The results showed that patients with diabetes needed more antihypertensive medication because they had better medical supervision and possibly more clinic appointments. Regular physical activity participation yielded slightly better treatment rates compared to other groups yet these differences were not statistically proven (p = 0.109) possibly because regular exercisers maintained good overall health-seeking behavior.

Table 4. Treatment Status by Comorbidities and Lifestyle Factors

Variable	Category	On Treatment (n=74)	Not on Treatment (n=52)	p-value
Diabetes	Yes (n=42)	31 (73.8)	11 (26.2)	0.021
	No (n=84)	43 (51.2)	41 (48.8)	
Dyslipidemia	Yes (n=29)	19 (65.5)	10 (34.5)	0.223
	No (n=97)	55 (56.7)	42 (43.3)	
Smoking	Current (n=33)	18 (54.5)	15 (45.5)	0.364
	Former (n=21)	13 (61.9)	8 (38.1)	
	Never (n=72)	43 (59.7)	29 (40.3)	
Physical Activity	Regular (n=44)	29 (65.9)	15 (34.1)	0.109
	Irregular (n=82)	45 (54.9)	37 (45.1)	

Values are frequency (% within each row).

The modeling analysis in Table 5 evaluates the factors for hypertension awareness through binary logistic regression. Age, sex, educational level and diabetes status make up the variables included in this model. Educational level enhancement along with diabetes diagnosis separately raised the probability of hypertension awareness levels by 2.36 and 2.49 times respectively (p=0.017 and p=0.014). The association between age and awareness was detected as a small positive relationship yet it did not reach statistical significance (p=0.056).

Table 5. Predictors of Hypertension Awareness (Binary Logistic Regression)

Variable	AOR (95% CI)	p-value
Age (years)	1.02 (0.98–1.07)	0.056
Sex (Female vs Male)	1.34 (0.67–2.72)	0.412
Education (≥Tertiary)	2.36 (1.17–4.61)	0.017
Diabetes (Yes vs No)	2.49 (1.22–5.04)	0.014

AOR = Adjusted Odds Ratio; CI = Confidence Interval.

The adjusted odds ratios for people managing their hypertension (n=74) can be found in Table 6. Women and older individuals demonstrated better blood pressure control based on the analysis results even though not all relationships produced statistically significant results. A statistical analysis indicated that persons who engaged in regular physical activity had a 2.31 times higher chance of maintaining blood pressure within recommended levels (p=0.018). This confirms

lifestyle modification plays a vital role in meeting treatment goals.

Table 6. Predictors of Blood Pressure Control Among Treated Patients (Binary Logistic Regression)

Variable	AOR (95% CI)	p-value
Age (years)	1.04 (0.99–1.09)	0.074
Sex (Female vs Male)	1.52 (0.78–2.96)	0.249
Diabetes (Yes vs No)	0.76 (0.35–1.64)	0.443
Regular Physical Activity	2.31 (1.16–4.48)	0.018

AOR = Adjusted Odds Ratio; CI = Confidence Interval.

Discussion

The study analyzes hypertension knowledge rates in association with treatment and control methods through adult patients who visit primary care clinics at King Faisal University (KFU) (KFU polyclinic) Saudi Arabia. Clinical hypertension management continues to face long-term challenges in primary care because of combined structural and personal factors that affect health behaviors and patient adherence and therapeutic effects.
Our study results show that 72.2% of participants were aware of their hypertension status which matches global middle-income statistics although more improvement is required. Worldwide hypertension awareness reached 46.5% according to Mills et al.'s meta-analysis yet there were large knowledge gaps between developed countries and less developed LMICs (19). The medical population attending the university clinic possesses better education and healthcare access so they show higher awareness rates for their conditions. Routine care facilities must implement both systematic and opportunistic screening programs to address the 27.8% of patients who do not know they have hypertension (20).

The relationship between patient awareness stood out in its correspondence with educational background as well as marital status. Research results from before confirm that better education levels make people more aware about health and encourage active wellness practices (13). Marital status may lead to increased engagement with healthcare services since both spouses promote regular check-ups (21). Research supports social cognitive theories particularly the self-efficacy framework created by Bandura because it shows how personal characteristics and social aspects guide health behavior choices (16).

High awareness of hypertension did not result in proper medical care because only 58.7% of the participants received treatment and only 41.9% of treated patients achieved controlled blood pressure levels. A considerable number of patients suffered from treatment failures at each step of the hypertension care path which matches the established epidemiological pattern known as the "rule of halves" (22). The gap in prescription treatment develops because of various factors through which patients exhibit inadequate medication adherence and physicians show weak follow-up care, along with substandard medication administration and patient doubts about long-term medicine use (23–27).
The poor blood pressure control rates of treated patients create worries about both medical treatment delays and patient treatment compliance. The practice of applying insufficient treatment despite inadequate blood pressure control is known as therapeutic inertia and this problem occurs frequently in primary care facilities which have heavy caseloads (11). Research on blood pressure control in Saudi Arabian patients has revealed both equivalent results and inferior rates compared to other studies which intensifies the necessity to implement patient-tailored approaches (12,16). The treatment adherence of patients with

unnoticeable hypertension conditions like hypertension faces challenges because of protective psychological factors which include medication fatigue along with denial of illness symptoms or fearlessness toward health risks (14-15).

Among treated patients physical activity showed itself as an essential factor which influenced blood pressure control results. Numerous studies confirm that steady aerobic workouts decrease both blood pressure measurements (systolic and diastolic) (25). Self-care involvement demonstrates better treatment results according to the psychological principle of health empowerment (28). Patients require lifestyle modification together with medication treatments for better control results and sustainable self-care abilities (29).

Patients diagnosed with diabetes in addition to hypertension showed better recognition and continued treatment of hypertension because they tend to have more hospital visits which improves detection and management of their conditions. Research from the past has demonstrated that patients with multiple health conditions benefit from better disease management because they require regular care from healthcare facilities (17). The relationship between diabetes management and control status failed to reach statistical significance due to possibly complicated dual management requirements and priority conflicts (24).

The examined outcomes can be influenced by behavioral together with psychosocial elements. Individual treatment adherence tends to increase when people view hypertension as a dangerous condition alongside believing that their treatment methods will work effectively according to the Health Belief Model and the Theory of Planned Behavior (30). Awareness of diagnosis among patients exists but more than a quarter of these individuals fail to receive proper treatment probably due to psychological barriers including fear of medication effects or denial mechanisms or misinterpretations of disease advancement (24). Health education and behavioral counseling approaches targeting specific patient groups would help bridge these knowledge deficits to boost patient adherence motivation (25).

The provision of suboptimal care occurs because some providers allocate brief consultation periods while patients receive limited treatment continuity and the medical staff does not consistently follow established guidelines for hypertension management (27). The KFU polyclinic maintain patient service accessibility yet their limited chronic disease management structures frustrate proper follow-up procedures. Health organizations can use digital strategies including mobile tool reminders and medication adjustment teleconsultations to address this deficiency (28).

Cultural norms and health system dynamics in Saudi Arabia also warrant consideration. Different research studies demonstrate that illness assessment varies based on religious values and trust in doctors affects treatment choices (19). One of the barriers to evidence-based management emerges when patients prefer traditional treatments and show reluctance to maintain pharmacological intervention for an extended period (30). Development of public health plans that adapt to local cultural elements becomes critical through understanding these cultural factors.

The results demonstrate why governments need to establish national screening systems in primary care along with specific protocols for managing hypertension. A useful framework called Global HEARTS by WHO enables screening combined with counseling and treatment and follow-up in low-resource areas (31). The country-wide Vision 2030 initiative allows Saudi Arabia to develop better primary healthcare systems with specific care pathways to manage chronic diseases.

Our research adds to the expanding body of scientific evidence which demonstrates the importance of centered care approaches in hypertension disease management. Identification of predictors among demographic groups and behavioral types emphasizes both risk communication approaches and decision-making collaboration for patients (33). Health psychology provides essential instruments for developing

chronic illness management interventions which approach both intellectual and emotional aspects (34).

Strengths and Limitations

The study's emphasis on primary care presents itself as a primary strength due to primary care serving as the main point of hypertension management. The research design incorporates clinical and behavioral factors for complete assessment of hypertension care results. This study does contain several significant drawbacks. Convenience sampling techniques limit broad application while the reported data through self-reports could lead to inaccurate assessments due to memory and impression biases. The study design as a cross-section prevents researchers (researcher) from establishing causal relationships between the variables. Longitudinal research or intervention studies need to be conducted to confirm and track how hypertension control progresses over time.

Conclusion

The survey indicates that KFU primary care patients have standard knowledge about hypertension diagnosis although their starting on medication rates and achieving blood pressure control demonstrate unsatisfactory outcomes. Four primary components influence patient success through all care steps from education level to diabetes comorbidity status and physical activity and possibly psychosocial elements along with systematic factors. The urgent need exists for interventions using cultural public health messages with behavioral strategies and structured care pathways to improve hypertension management in Saudi Arabia along with similar healthcare settings.

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