Epidemiology and Health System Journal
doi:10.34172/ehsj.26284 2024 Autumn;11(4):184-190 http://ehsj.skums.ac.ir

Original Article

Factors Influencing Treatment Satisfaction Among Hypertensive Patients in Iran

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Abstract

Background and aims: Hypertension (HTN) represents a significant global health concern associated with severe complications, including cardiovascular diseases, stroke, and kidney failure. Effective management and patient satisfaction with treatment are crucial for controlling the condition and preventing premature mortality. This cross-sectional study evaluated factors influencing treatment satisfaction among 319 hypertensive patients across 50 primary healthcare centers in Kerman, Iran, during January and February 2021.

Methods: This cross-sectional study focused on patients with HTN who were referred to fifty primary healthcare institutions in Kerman, southeast Iran, between January and February 2021. The 14-item Treatment Satisfaction Questionnaire for Medication (TSQM-14) and the 8-item Morisky Medication Adherence Scale were utilized to evaluate treatment satisfaction and medication adherence, respectively. Bivariate and multiple linear regression models were employed to identify factors associated with treatment satisfaction, which was scored on a scale from 0 to 100, reporting beta coefficients (B) and 95% confidence intervals (CI).

Results: In this study, participants with HTN had a mean age of 56.7 ± 13 years. Overall, the average treatment satisfaction among respondents was 61.1 ± 15.0. In the multiple regression model, treatment satisfaction was significantly associated with having a diagnosis of HTN for more than a decade (B = 4.9; 95% CI: 1.3-8.6), measuring blood pressure (BP) more than eight times per month (B = 8.3; 95% CI: 4.1-12.4), achieving controlled BP (B = 6.5; 95% CI: 2.9-10.0), and adhering to treatment (B = 5.6; 95% CI: 2.4-8.8).

Conclusion: Treatment satisfaction among hypertensive patients is currently suboptimal. Enhancing BP monitoring and medication adherence through targeted interventions has the potential to improve patient satisfaction and promote better long-term health outcomes.

Keywords: Hypertension, TSQM-14 instrument, Treatment satisfaction, Iran

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Received: October 5, 2024
Revised: December 3, 2024
Accepted: December 3, 2024
ePublished: December 31, 2024

Introduction

Hypertension (HTN) is a prevalent chronic condition associated with serious complications, including renal failure, cardiovascular diseases, and stroke. It significantly contributes to global mortality rates.[1] In 2019, an estimated 1.3 billion adults aged 30–79 years were affected by HTN, with the majority of cases occurring in low- and middle-income countries.[2] However, treatment coverage and effective control of HTN remain inadequate, with only 42% of affected individuals receiving treatment and merely 21% achieving adequate control of their condition.[3,4] According to a systematic review conducted in Iran, over 26% of adults are affected by HTN; however, less than 40% achieve adequate control of their condition, despite more than 80% receiving medication.[5,6]

Factors such as health literacy and the cost-effectiveness of medications are critical in the management of chronic diseases and significantly influence health outcomes.[7] HTN necessitates lifelong management and adherence to medication and compliance with treatment regimens are pivotal for effective disease control.[8] While lifestyle modifications, such as healthy diets, smoking cessation, and physical activity, can assist in lowering blood pressure (BP), many patients still necessitate medication.[9] Importantly, a significant 46% of adults with HTN are unaware of their condition, which can result in disruptions to their treatment.[2]

Low medication adherence is a significant risk factor for mortality and disability among hypertensive patients and continues to be a concern in Iran and other countries.[10,11] Conversely, research has demonstrated a positive association between medication adherence and treatment satisfaction, with dissatisfied patients exhibiting significantly poorer control of their HTN.[11,12]

Treatment satisfaction is defined as patients' assessment of the treatment process and its outcomes, influenced by factors such as comorbidities, lifestyle, and behavioral circumstances.[13] It is regarded as a critical indicator of care quality, influencing health-related decisions, particularly in chronic diseases such as HTN that necessitate long-term management.[14] Dissatisfaction with treatment can result in poor adherence, thereby exacerbating complications related to HTN.[15]

Patients satisfied with their treatment are more likely to adhere to prescribed therapies, attend follow-up appointments, and adopt healthy practices, thereby improving health outcomes.[16] However, studies indicate that dissatisfaction with treatment can result in poor adherence, thus increasing the likelihood of uncontrolled BP and associated health complications.[16] Medication side effects, perceived effectiveness, ease of use, and accessibility significantly impact treatment satisfaction. Accordingly, addressing these factors can enhance adherence, improve attendance at follow-up appointments, and promote the adoption of healthy lifestyles, ultimately leading to better patient outcomes.[17] By understanding and enhancing treatment satisfaction, healthcare providers can facilitate improved health outcomes, reduce the risk of HTN-related complications, and enhance the overall quality of life for patients with HTN.[18]

Factors influencing treatment satisfaction are complex and often interrelated, making comprehensive assessment challenging. Previous studies generally concentrated on one or a few parameters at a time or primarily examined key factors within the context of other diseases.[16,18,19] This study seeks to identify multiple parameters independently associated with treatment satisfaction in a community-based sample of hypertensive patients. Identifying these factors may assist healthcare systems and primary care providers in targeting specific areas to enhance patient satisfaction, which could subsequently influence clinical outcomes.

Materials and Methods

Participants and Setting

This cross-sectional study targeted hypertensive patients attending healthcare delivery centers in Kerman, affiliated with the University of Medical Sciences, in 2021. Kerman, located in southeastern Iran, has a population of over one million and provides primary healthcare services through 50 healthcare delivery centers. The study employed a multi-stage sampling approach to select its sample. Initially, ten centers were randomly chosen from a total of 50. Subsequently, 35 patients were recruited from each of the selected centers using the convenience sampling technique. The study population consisted of individuals aged 18 years and older who had been diagnosed with HTN and were undergoing pharmacological treatment with at least one antihypertensive medication for a minimum duration of one year.

Study Instruments

The 14-Item Treatment Satisfaction Questionnaire for Medication

The Treatment Satisfaction Questionnaire for Medication (TSQM-14), developed by Atkinson et al in 2004, is a valuable instrument for assessing patient satisfaction with their medication, particularly in the context of chronic diseases.[20] It provides a structured method for gathering patient perspectives on medication satisfaction, facilitating the evaluation of adherence, identifying areas for improvement in medication management, and ultimately enhancing outcomes in chronic disease care. This questionnaire consists of 14 items organized into four dimensions, namely, effectiveness (items 1-3), side effects (items 4-8), convenience (items 9-11), and global satisfaction (items 12-14). The first dimension assesses perceived medication efficacy, and the second one evaluates experiences and perceptions of adverse effects. In addition, convenience examines factors such as dosing frequency and ease of use, and finally, global satisfaction provides an overarching assessment of medication satisfaction.

Respondents rate each item on a five-point Likert-type scale, indicating their level of agreement or disagreement with statements about the medication, ranging from "strongly disagree" to "strongly agree." Each subscale is standardized to a range of 0–100. The scores from the four dimensions are then averaged to yield a treatment satisfaction score that also ranges from 0 to 100.

The reliability and validity of the TSQM-14 were assessed, obtaining a Cronbach's alpha of 0.83 and an intraclass correlation coefficient of 0.91 for the summed scales. The structural equation modeling indices indicated an adequate model fit ($\chi^2 = 118.9$, $P \leq 0.001$, CFI = 0.96, RMSEA = 0.07, TLI = 0.95, and NFI = 0.91). Additionally, the content validity and face validity of the questionnaire were evaluated in a separate study conducted in Iran.[21]

The 8-Item Morisky Medication Adherence Scale

The MMAS-8 is utilized to assess medication adherence among Iranian patients with HTN. Except for item eight, which employs a 5-point Likert-type scale, the other items utilize binary yes/no responses. These responses are scored as either 0 or 1, while item eight is rated on a scale of 0, 0.25, 0.5, 0.75, and 1. The total score is calculated by summing the scores of all items, resulting in a scale that ranges from 0 to 8. A study reported acceptable reliability and validity for the Persian version of the MMAS-8 among Iranian hypertensive patients.[22] The content validity ratio and content validity index values for the items of the MMAS-8 were found to be ≥ 0.75 and > 0.79, respectively.[23]

Study Variables

Dependent Variable

Treatment satisfaction, the dependent variable in this study, was assessed using the TSQM-14.

Independent Variables

The independent variables in this study included age (less than 60 years or 60 years and older), gender (male or female), marital status (with spouse or without spouse), education level (less than a diploma or diploma/academic education), income level (inadequate or adequate), and employment status (employed, housekeeper, retired, or unemployed). The remaining independent variables were a history of HTN (≤10 years or >10 years), number of daily medications for HTN control (1, 2, or 3 or more), frequency of HTN control visits per month (less than 4, 4-8, or more than 8), comorbidity (yes or no), BP control (controlled or uncontrolled), and medication adherence (non-adherent or adherent).

Statistical Analysis

Descriptive statistics, including frequencies and percentages, were reported for each variable. To assess the normality of the response variable, independent sample t-tests and one-way ANOVA tests were employed to investigate the associations between the response variable and the independent variables. A bivariate and multiple linear regression model was utilized to evaluate the correlates of treatment satisfaction among the hypertensive participants, with beta coefficients and 95% CIs. In the linear regression analysis, all independent variables were initially included in the bivariate model. Variables with a *P* value less than 0.2 were subsequently entered into the multiple regression model. All analyses were conducted using IBM SPSS Statistics (version 20), with *P* values less than 0.05 considered statistically significant.

Results

The survey included responses from 319 individuals diagnosed with HTN. On average, participants were 56.7 years old (standard deviation [SD] = 13.0), with females comprising 57.7% of the sample (n = 184). The majority of participants (71.2%, n = 227) were married, while 23.8% (n = 76) reported having no formal education. Employment status varied, with 27% (n = 86) of respondents employed; the remaining respondents were unemployed, retired, or housekeepers. Additionally, 27.3% (n = 87) reported having inadequate income. Approximately half of the participants (49.5%, n = 158) had comorbid medical conditions alongside HTN, and 22.9% (n = 73) had been diagnosed with HTN for over a decade. Only 8.8% (n = 28) of patients indicated using three or more daily medications for HTN control, and over 59% (n = 190) monitored their BP fewer than four times each month. Furthermore, about half of the participants had comorbidities, and nearly 30% (n = 93) had uncontrolled BP. Notably, more than half of the patients were non-adherent to their treatment regimen.

Overall, the respondents had a mean (SD) total treatment satisfaction score of 61.1 (15.0). The mean (SD) scores for effectiveness, side effects, convenience, and global satisfaction (four dimensions of treatment satisfaction) were 60.0 (17.2), 70.4 (25.6), 58.3 (17.6), and 55.8 (21.8), respectively. The mean (SD) treatment satisfaction score was significantly higher among patients with adequate income (62.5 [15.4]), retired individuals (66.0 [16.2]), those diagnosed with HTN for over a decade (64.8 [16.8]), patients monitoring their HTN more than eight times each month (67.0 [18.7]), those with controlled BP (62.8 [15.3]), and patients adherent to their treatment regimen (65.0 [15.5]). The related data are provided in Table 1.

In the bivariate regression model (Table 2), treatment satisfaction was significantly associated with several factors, including adequate income (B = 4.9; 95% CI: 1.3–8.6), retired status (B = 9.2; 95% CI: 3.0–15.4), and a HTN diagnosis lasting over a decade (B = 5.1; 95% CI: 4.5–35.9). It was also related to monitoring HTN more than eight times per month (B = 8.8; 95% CI: 4.6–13.1), controlled BP (B = 6.0; 95% CI: 2.4–9.6), and treatment adherence (B = 7.0; 95% CI: 3.7–10.3).

In the multiple regression model (Table 3), treatment satisfaction was noticeably associated with having been diagnosed with HTN for over a decade (B = 5.0; 95% CI: 1.2–8.7), monitoring HTN more than eight times per month (B = 6.7; 95% CI: 2.2–11.0), maintaining controlled BP (B = 6.7; 95% CI: 3.1–10.2), and adhering to treatment (B = 4.9; 95% CI: 1.6–8.2).

Discussion

HTN is a significant non-communicable disease worldwide; however, to date, no study, to the best of our knowledge, has investigated treatment satisfaction and its associated variables among hypertensive patients in Iran. Treatment satisfaction, which is defined as patients' evaluation of the medication adherence process and its outcomes, is crucial for the effective management of HTN.[24] Satisfaction with treatment is a critical factor in the successful management of patients with high BP. In this study, the mean (SD) treatment satisfaction score, assessed using the TSQM-14, was 61.1 ± 15.0. This score is notably lower than the 75.6 ± 10.5 reported in a previous study that utilized the TSQM questionnaire.[25] In the study conducted by Iloh and Amadi, the satisfaction rate for high BP treatment was estimated at 78.6%[26]. Similarly, respondents in the research performed by Akpor and Olowolaju reported a satisfaction rate of 82.9% with their treatment.[27]

Our findings revealed that participants expressed the highest satisfaction regarding treatment side effects, with a mean score of 70.4, which is consistent with the results of a similar study, indicating that treatments were generally well-tolerated and had minimal impact on daily life[28]. However, satisfaction levels were lower for effectiveness (mean: 60.0), convenience (mean: 58.3), and global satisfaction (mean: 55.8). These findings suggest potential gaps between treatment outcomes and patient expectations, as well as challenges related to ease of use. Hence, addressing these issues through a comprehensive approach could enhance satisfaction across all treatment dimensions and improve overall patient satisfaction

Table 1. Association Between Demographic Characteristics and Treatment Satisfaction Among Iranian Patients With Hypertension

Variables	No. (%)	Treatment Satisfaction Mean (SD)	*P* Value
Overall	319 (100)	61.1 (15.0)	
Age			
<60	181 (56.7)	60.7 (15.1)	0.525
≥60	138 (43.3)	61.7 (14.8)	
Gender			
Female	184 (57.7)	61.3 (15.1)	0.795
Male	135 (42.3)	60.9 (14.8)	
Marital status			
Married	227 (71.2)	60.7 (15.2)	0.466
Single	92 (28.8)	62.1 (14.5)	
Education level			
Diploma or less than a diploma	205 (64.3)	61.0 (14.4)	0.825
Academic education	114 (35.7)	61.4 (16.1)	
Income			
Inadequate	87 (27.3)	57.5 (13.3)	0.008
Adequate	232 (72.7)	62.5 (15.4)	
Employment status			
Employed	86 (27)	59.8 (14.1)	0.006
Housekeeper	122 (38.2)	59.8 (13.3)	
Retired	81 (25.4)	66.0 (16.2)	
Unemployed	30 (9.4)	57.0 (17.8)	
History of hypertension (HTN)			
≤10	246 (77.1)	60.0 (14.2)	0.016
>10	73 (22.9)	64.8 (16.8)	
Number of daily medications for HTN control			
1	186 (58.3)	60.8 (13.4)	0.900
2	105 (32.9)	61.6 (17.1)	
3 or more	28 (8.8)	61.3 (16.8)	
Number of HTN controls in month			
<4	190 (59.6)	58.2 (12.9)	<0.001
4-8	69 (21.6)	63.8 (15.0)	
>8	60 (18.8)	67.0 (18.7)	
Comorbidity			
Yes	158 (49.5)	60.8 (14.9)	0.692
No	161 (50.5)	61.5 (15.1)	
Blood pressure			
Controlled	226 (70.8)	62.8 (15.3)	0.001
Uncontrolled	93 (29.2)	57.0 (13.5)	
Medication adherence			
Non-adherent	176 (55.7)	58.0 (13.9)	<0.001
Adherent	140 (44.3)	65.0 (15.5)	

Table 2. Bivariate Regression Models Identifying Factors Associated With Treatment Satisfaction Among Iranian Hypertensive Patients

Variables	Crude B (95% CI)	*P* Value
Age		
<60	Ref.	
≥60	1.06 (-4.4–2.3)	0.537
Gender		
Female	0.31 (-3.0–3.7)	0.856
Male	Ref.	
Marital status		
Married	Ref.	
Single	1.2 (-2.5–4.9)	0.525
Education level		
Diploma or less than diploma	Ref.	
Academic education	0.4 (-3.9–3.0)	0.814
Income		
Inadequate	Ref.	
Adequate	4.9 (1.3–8.6)	0.008
Employment status		
Employed	2.8 (-3.3–8.9)	0.362
Housekeeper	2.7 (-3.2–8.6)	0.366
Retired	9.2 (3.0–15.4)	0.004
Unemployed	Ref.	
History of HTN		
≤10 years	Ref.	
>10 years	5.1 (4.5–35.9)	0.012
Number of daily drug use		
1	Ref.	
2	0.7 (-2.9–4.3)	0.716
3 or more	0.4 (-5.5–6.4)	0.883
Number of HTN controls in month		
<4	Ref.	
4-8	5.4 (1.4–9.5)	0.008
>8	8.8 (4.6–13.1)	<0.001
Comorbidity		
Yes	0.6 (-10.7–15.8)	0.704
No	Ref.	
Blood pressure		
Controlled	6.0 (2.4–9.6)	0.001
Uncontrolled	Ref.	
Medication adherence		
Non-adherent	Ref.	
Adherent	7.0 (3.7 – 10.3)	<0.001

Note. CI: Confidence interval; HTN, hypertension.

in the future.

The association between retirement status and increased treatment satisfaction may be attributed to specific factors influencing how retirees manage HTN. Retirees generally possess greater time and flexibility, alleviating logistical challenges associated with medical appointments, medication regimens, and BP monitoring. This increased availability may enhance adherence to treatment protocols and improve the overall care experience.[29] Furthermore, aging frequently leads to a realignment of priorities toward health, motivating retirees to take a

Table 3. Multiple Regression Models Identifying Factors Associated With Treatment Satisfaction Among Iranian Hypertensive Patients

Variables	Adjusted B (95% CI)	*P* Value
Income		
Inadequate	Ref.	
Adequate	2.2 (-1.6 – 6.1)	0.255
Employment status		
Employed	0.8 (-5.4 – 6.8)	0.807
Housekeeper	0.5 (-5.2 – 6.1)	0.879
Retired	4.1 (-2.1 – 10.3)	0.128
Unemployed	Ref.	
History of HTN		
≤10 years	Ref.	
>10 years	5.0 (1.2 – 8.7)	0.009
Number of HTN controls in month		
<4	Ref.	
4-8	5.9 (1.9 – 9.9)	0.004
>8	6.7 (2.2 – 11.0)	0.002
Blood pressure		
Controlled	6.7 (3.1 – 10.2)	<0.001
Uncontrolled	Ref.	
Medication adherence		
Non-adherent	Ref.	
Adherent	4.9 (1.6 – 8.2)	0.004

Note. CI: Confidence interval; HTN, hypertension.

proactive approach to managing chronic conditions such as HTN. Increased interactions with healthcare providers afford retirees greater access to support and information, thereby enhancing their confidence and satisfaction with treatment. Additionally, the reduction of work-related stress, which is often experienced during retirement, may further contribute to improved overall well-being and facilitate healthier self-care behaviors. This dynamic can create a positive feedback loop that supports effective HTN management and enhances treatment satisfaction.

In our study, adequate income was positively correlated with treatment satisfaction, indicating that financial stability may influence patients' perceptions of and engagement with their healthcare.[30] Patients with higher incomes may have improved access to healthcare resources, facilitating more consistent treatment adherence and enhancing their overall satisfaction with care. Conversely, as noted, lower-income patients frequently encounter challenges related to both access to and quality of healthcare services.[31] Limited financial resources can pose significant barriers to the regular use of medications, routine follow-up visits, and other essential components of HTN management, ultimately impacting overall treatment satisfaction.

A comprehensive understanding of the determinants influencing treatment satisfaction has become a vital component of HTN management strategies.[32] In addition, a thorough understanding of the factors influencing treatment satisfaction is essential for predicting patients' quality of life and their ability to manage high BP effectively. Numerous variables can impact patient satisfaction with HTN treatment, and these influences should not be overlooked. By recognizing the determinants of patient satisfaction and delivering appropriate and effective treatment, healthcare providers can enhance treatment outcomes and minimize adverse side effects. Based on the findings of the current study, patients who expressed satisfaction with their treatment exhibited better BP control and higher rates of medication adherence.

Morisky et al and Bharmal et al noted that the precise mechanism by which treatment satisfaction is linked to medication adherence remains unclear.[33,34] However, low satisfaction with treatment appears to be linked to psychosocial well-being, which can adversely affect a patient's capacity to manage chronic diseases and other health issues.[34,35] Krousel-Wood et al found that satisfaction with treatment was positively associated with medication adherence,[36] which aligns with the findings of the current study. Other research indicated that medication adherence was significantly higher among patients who were satisfied with their BP management compared to those who were dissatisfied.[26]

The findings of this study underscore the significance of adherence to antihypertensive medications in relation to patient satisfaction with treatment outcomes. Therefore, to fully leverage the potential benefits of antihypertensive drugs, it is essential to address the obstacles and barriers that impact treatment satisfaction.[37] Saarti et al concluded that patients' adherence to medication is more closely related to their satisfaction with treatment than to their understanding of the disease.[38] Consequently, assessing patient adherence to antihypertensive medications in outpatient settings is a crucial initial step for physicians and other healthcare professionals in evaluating the effectiveness and satisfaction of the therapies they provide.[39]

Additional research has corroborated the reported association between treatment satisfaction and BP management in patients with HTN,[16,35,38,40] aligning with the findings of the current investigation. In the study by Chen et al, individuals whose BP was managed in accordance with JNC 7 standards demonstrated higher satisfaction with their medication compared to those whose BP was not regulated (90.3% vs. 71.5%).[41] Furthermore, increasing awareness and understanding of treatment satisfaction in the management of HTN is essential for developing multidisciplinary approaches aimed at enhancing medication adherence and BP control. Ensuring that hypertensive patients are satisfied with their treatment is critical as they navigate the care pathway within the hospital environment. Our study is the first to assess patient satisfaction with HTN and its related factors using validated instruments. However, it has some limitations. First, the primary limitation was its cross-sectional design, which precludes the establishment

of causal relationships. Second, the study did not account for the severity of HTN; thus, more precise measurements may be necessary to ascertain whether BP was effectively managed. Finally, because participants were recruited from a single location, the generalizability of our findings to the broader population is limited.

Conclusion

This study emphasizes that treatment satisfaction among hypertensive patients is currently suboptimal, highlighting the necessity for promoting regular BP monitoring and adherence to prescribed medication regimens. Targeted interventions aimed at these areas could significantly enhance patient satisfaction and contribute to improved long-term health outcomes. Ultimately, enhancing treatment satisfaction is likely to encourage greater engagement in HTN management and reduce the risk of complications associated with uncontrolled BP.

Acknowledgments

We would like to express our gratitude to the participants for their time and valuable insights.

Authors' Contribution

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Competing Interests

The authors declare that they have no conflict of interests.

Ethical Approval

The study proposal received approval from the Ethics Committee of Kerman University of Medical Sciences (Ethical code IR.KMU.AH.REC.1398.089). Verbal informed consent was obtained from all patients prior to their participation in the study.

Funding

This study was self-funded by the authors and received no external financial support from any funding organization.

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