Association between Medical Adherence and Perception of Disease among Hypertensive Patients visiting a Tertiary Care Teaching Hospital

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ABSTRACT

Introduction
Medication adherence level is influenced by disease type and its severity, patient characteristics, socioeconomic factors, type of treatment and its regimen. Proper adherence to treatment is very important to obtain a higher therapeutic benefit. The aim of this study was to study the association between medical adherence and perception of disease among hypertensive patients.

Methods
It was a cross-sectional study involving 148 hypertensive patients based on convenience sampling technique conducted in the tertiary care Teaching hospital. Patients who have been taking antihypertensive medications for at least 6 months were enrolled. A structured questionnaire was used for data collection. JASP statistical software was used for data analysis.

Results
In this study 148 hypertensive patients taking medications were enrolled. Out of them, 54 (36.5%), 58 (39.2%) and 36 (24.3%) had low, medium and high level of adherence; while 94 (63.51%) 31 (20.95%) and 23 (15.54%) had perceived their disease as low, medium and high threat.

Conclusion
Medication adherence was found to be lower among the hypertensive patient, yet more than half had good perception. Regular monitoring and awareness program could be effective for the prevention of complications.

Keywords
Hypertension, medical adherence, therapeutic benefit

INTRODUCTION

Around 1.4 billion individuals worldwide are thought to have high blood pressure, yet only 14% of them have it under control, according to the World Health Organization (WHO).[3]Nepal reported the highest percentage of hypertensive individuals (33.8%) among South Asian countries.[5] Antihypertensive drugs are required to maintain optimal blood pressure and reduce cardiovascular events. To achieve a high therapeutic benefit, it is crucial to use medications as prescribed by a physician.[6]

WHO has defined medical adherence as individual behavior in taking medicine, adopting healthy diets, maintaining balance life style and following proper medical or health advice.[7]Medication adherence level depends upon type of disease and its severity, patients characteristics, socioeconomic factors, treatment plan, family support, awareness about disease, drug regimen that are prescribed by healthcare providers.[8] In order to lower the risks of non-adherence it is crucial to identify predictors and adherence barriers.

This study aimed to determine medication adherence and its effects in perception of illness among hypertensive patients.

METHODS

This cross-sectional study was conducted among hypertensive patients attending in tertiary care teaching hospital. The study was carried out from April 2023 to Sept 2023 for period of six months after taking ethical clearance from institutional review committee. The inclusion criteria were adults aged 18 years or above on antihypertensive medication for at least six months. By using convenient sampling method, based on the presumption of prevalence of hypertension 148 sample size was calculated. Written informed consent was taken before enrolling in the study. Questionnaire were based on existing literatures.[7,9,10,] The data collection tool was divided into three sections. The first section focused on gathering socio-demographic information, including age, sex, residence, educational level, employment status, marital status, and monthly income. The second section assessed medication adherence through eight questions. Questions 1 to 7 required "yes" or "no" responses, where "no" was scored as 1 and "yes" as 0, except for question 5, where "yes" was scored as 1 and "no" as 0. Question 8 utilized a 5-point Likert scale, with responses standardized by dividing the score (0–4) by 4 to compute a summated score. The total adherence score ranged from 0 to 8, with scores of 8 indicating high adherence, 6–7 indicating medium adherence, and scores below 6 indicating low adherence.

The third section evaluated illness perception using the Brief Illness Perception Questionnaire (B-IPQ), a validated tool measuring eight aspects: consequences, timeline, personal control, treatment control, identity, concerns, understanding, and emotional representation.[11] Each aspect was scored on an 11-point Likert scale, where higher scores indicated a more threatening perception of the illness, while lower scores suggested a more benign view. The presence of comorbidities and related treatments was also documented.

Data analysis was done using SPSS version 20. Quantitative data were summarized using means and standard deviations, while qualitative data were presented as frequencies and percentages. A multivariate binary logistic regression model was used to identify independent predictors of medication adherence, comparing adherence categories (high vs. low). The model analyzed binary outcomes in relation to predictors from the data collection form, using one category of each variable as the reference. Adjusted odds ratios (ORs) and confidence intervals (CIs) were calculated, with significant predictors identified as OR > 1 and CIs excluding the null value (0).

Additionally, Spearman's correlation and Chi-square tests were performed to examine the relationship between overall B-IPQ scores and adherence levels. A p-value of ≤0.001 was considered statistically significant.

RESULTS

A total of 148 hypertensive patients taking antihypertensive medicine were participated in the study in which (46.6 %) were from the age group below 60 years and (53.4%) were from the age group above 60 years. There were 72 (48.6%) were male and 76 (51.4%) were female. 58% of the patients were from city areas whereas 42% of the patients were from urban areas. Similarly 39.2% of the patient have got graduation, 27% have got primary/secondary level education whereas 33.8 % have got only formal education. Based on occupation more than 55% were employed in government and private office whereas 23% were unemployed and 18% of the patients were retired, 43.9% were married 47.3% were divorced or widowed and 8.8% were single unmarried. Among them, 53.4% patients have average income of less than one lakh per annum whereas 46.4% have average income more than one lakh per annum. On the basis of disease 38.5% had only hypertension whereas 61.5% were associated with other disease along with hypertension.

Patients were grouped into adherent and non adherent to medication based on the sum of scores reported on various factors. On that basis 54 (36.5%) were adherent and 94 (63.5%) were non adherent to the medication.

Table 1. Socio-demographic information of respondents (n=148)

Characteristics	Number (%)
Age (years)	
≤60	69 (46.6)
>61	79 (53.4)
Sex	
Male	72 (48.6)
Female	76 (51.4)
Residence	
City	86 (58.1)
Village	62 (41.9)
Education	
Formal education	50 (33.8)
primary/secondary	40 (27.0)
Graduates/University	58 (39.2)
Occupation	
Government employee	36 (24.3)
Private employee	46 (31.1)
Unemployed	38 (25.7)
Retired	28 (18.9)
Marital status	
Married	65 (43.9)
Divorced /widowed	70 (47.3)
Single	13 (8.8)
Income	
<1 lakh per annum	79 (53.4)
>1 lakh per annum	69 (46.6)
Other Disease	
Other diseases	91 (61.5)
Only HTN	57 (38.5)
Duration of HTN	
< 5 yr	55 (37.2)
> 5 yr	93 (62.8)
Duration of treatment	
< 5 yr	78 (52.7)
> 5 yr	70 (47.3)

Table 2. Medicine adherence and perception of disease among respondents (n=148)

Characteristics	Number (%)
Adherence category	
Low	54 (36.5)
Medium	58 (39.2)
High	36 (24.3)
Perception category	
Low threat	94 (63.5)
Medium threat	31 (20.9)
High threat	23 (15.5)

Table 3. Effect of demographic factors on medication adherence (n=148)

Characteristics	Chi-square value (df)	p-value
Sex	2.61 (1)	0.11
Age	4.47 (1)	0.035*
Residence	2.56 (1)	0.11
Education	16.04 (2)	<0.001*
Occupation	12.28 (3)	0.006*
Marital	1.51 (2)	0.47
Income	6.03 (1)	0.014*
Other disease	9.53 (1)	0.002*
Therapy	0.96 (1)	0.33
Cost	3.14 (1)	0.08
Duration of disease	6.24 (1)	0.013*
Duration of treatment	8.37 (1)	0.004*

Table 4. Effect of disease perception on medication adherence (n=148)

Characteristics	Chi-square value (df)	p-value
Illness affect	3.63 (2)	0.16
Illness last	11.51 (2)	0.003*
Control Illness	6.30 (2)	0.043*
Treatment help	58.35 (2)	<0.001*
Feel symptoms	0.83 (2)	0.66
Worried	19.27 (2)	<0.001*
Family support	7.89 (2)	0.019*
Medicines availability	12.77 (2)	0.002*
Doctors availability	25.67 (2)	<0.001*
Society awareness	1.48 (1)	0.048

Patients were more likely to forget taking medication if they were elderly, poorly educated, unemployed, lower income and had any other disease/s additional to hypertension.

Patients perception on longevity of the illness, control over the treatment, help offered by the treatment, family support, availability of medicines and doctors locally available had a significant effect on medication adherence.

Correlation between medication adherence and demographic factors

Medication adherence was significantly correlated to the age (r= -0.16, 95% CI= -0.32 to -0.003, p=0.047),income (r= 0.20, 95% CI= 0.04 to 0.35, p=0.014), presence of other disease (r= 0.25, 95% CI= 0.10 to 0.40, p=0.002),duration of HTN (r= -0.21, 95%CI= -0.36 to -0.05, p= 0.012) and duration the participant was on treatment for HTN (r= -0.24, 95%CI= -0.38 to -0.08, p= 0.004). There was no correlation of medication adherence with sex, residence, occupation, marital status, type of drug the participant was using and cost of treatment.

Medication adherence was significantly correlated with perception on help offered by treatment towards the cure of disease(r= -0.30, 95% CI= -0.44 to -0.15, p<0.001) and worries on the illness (r= 0.25, 95% CI= 0.09 to 0.39, p= 0.002). The correlation of medication adherence with perception on how illness affected one's life, longevity of the illness, feeling of control with the disease, feelings on disease symptoms, family support on treatment, societal awareness on the disease and availability of medicines and doctor's locally availability were not statistically significant.

DISCUSSION

This study aimed to assess the medication adherence of patients to antihypertensive agents According to World Health Organisation, lower adherence is considered as the main factor contributing to uncontrolled blood pressure.[12]The present study found that 36.5 % patients had adherence to their antihypertensive medications. similar study done in Saudi Arabia reported (36.3%)[7], A survey conducted by Algabbani et al in the Riyadh region of the KSA found a slightly higher proportion (42%) adherence.[13] this variation in adherence mainly occurs due to diverse study populations ,study period and varied scales used for measurement. Another study conducted in eastern Nepal revealed 56.5% adherent to antihypertensive therapy[14]. However in similar other studies conducted among Swedish adults (87.3%),[15] have found higher adherence the possible reasons for the differences in the percentage of adherence rate could be variation in the methods applied to determine adherence. Other reasons could be due to variation in the educational level of the participants, complexity of drug regimens, participants' knowledge, and health conditions.

In our study it was found that (63.5%) of the patients were non adherent to the medication similar study done in Malaysia reported lower adherence rate of 53.4%.[16] The major reason for non adherence to antihypertensive medication would be lack of knowledge, fear of side effects of medicine, financial burdens, poor communication, lack of education, forgetfulness and low social support.

Medication adherence was significantly correlated to the age (r= -0.16, 95% CI= -0.32 to -0.003, p=0.047),income (r= 0.20, 95% CI= 0.04 to 0.35, p=0.014), presence of other disease (r= 0.25, 95% CI= 0.10 to 0.40, p=0.002),duration of HTN (r= -0.21, 95%CI= -0.36 to -0.05, p= 0.012) and duration the participant was on treatment for HTN (r= -0.24, 95%CI= -0.38 to -0.08, p= 0.004).The present study's findings related to age were similar with the study conducted in eastern Nepal (AOR = 0.96, 95%

CI =0.93–0.99, p = 0.021)[14] and studies by Hyre et al in New Orleans.[17]In contrast, to present findings, many studies have shown better association of treatment adherence with demographic variables, lower adherence is associated with age >50,males,uneducated,unemployed,retired,and having comorbidities[18].Good adherence is associated with urban residents, married, high annual household income, taking fewer medicine daily and having good education and knowledge of disease and its treatment[19].

There was no correlation of medication adherence was found with sex, residence, occupation, marital status, type of drug the participant was using and cost of treatment. similar study done in India also found no association between demographic characteristics such as gender, socioeconomic status, number of drugs, cost of drugs, duration of disease or duration of drug therapy[20].Another study conducted in china by Zhang et al. showed that non-adherence was statistically associated with age, residence, education, yearly household income, and out-patient medical reimbursement (p<0.05),[21] which counteract to the results of our study. This indicates that the percentage of non-adherence was much greater among patients who lived in rural areas, had low yearly incomes, and did not receive medical insurance coverage.

In our study we observed that patients were more likely to forget taking medicine were elderly, poorly educated, unemployed, lower income and having additional disease along with hypertension. similar study done by Rao CR et al,[22]found that aging is one of the factors to contribute non adherence to medication because they may have difficulty in remembering to take medicine along with co morbid conditions ,impairment of memory leads to confusion in taking medicine. Similar studies have reported forgetfulness and absence of symptoms of hypertension side effects of drugs and drugs out of supply were the major factor for non adherence[23].

Education is a critical factor in medication adherence. Individuals with limited education may lack the necessary knowledge and communication skills to fully understand their treatment plans, which can lead to non-adherence. Similarly, unemployment can add financial strain, directly impacting adherence due to the inability to afford medications. Studies have shown that patients who are well-informed—knowing their medication names, how to take them, what to do if they miss a dose, and how to manage potential side effects—demonstrate significantly better adherence[24]. Our findings, along with those of similar studies, also highlight the importance of financial support in preventing complications, especially in hypertensive patients. Physicians can play a role in alleviating financial burdens by minimizing the number of prescribed medications

when appropriate, helping to enhance adherence[25].

Patients' perceptions about the duration of their illness, their control over treatment, the benefits of the treatment, family support, and the local availability of medicines and doctors significantly influenced medication adherence. Similarly, a study by Hu et al. in the Chinese community found that greater family social support was positively associated with adherence, with a 10-unit increase in family support raising the odds of medication adherence by 1.39 (95% CI, 1.03–1.87).[26] In Nigeria, Osamor's study also showed that patients with support from friends and family exhibited improved adherence to treatment, underscoring the value of social support a-cross diverse communities.[27]Medication adherence was significantly correlated with perception on help offered by treatment towards the cure of disease(r= -0.30, 95% CI= -0.44 to -0.15, p<0.001) and worries on the illness (r= 0.25, 95% CI= 0.09 to 0.39, p= 0.002). Patients with strong beliefs in treatment efficacy and lower distress tend to be more adherences. Patients with view of fewer symptoms and who perceived higher treatment control with positive treatment perceptions improve adherence.

The study's findings indicate that while several factors were examined in relation to medication adherence—including personal perceptions about the illness's impact on life, longevity, control over the disease, symptom-related feelings, family support, societal awareness, and local availability of healthcare resources—none showed statistically significant correlations. Similar study done in European population has implicated that patient perception and attitudes towards health have been recognized as one of the barriers for adherence.[28]This suggests that these factors may not play a direct or strong role in influencing adherence in this context. However, this could vary depending on individual beliefs, healthcare systems, or cultural attitudes, and may indicate that other personal or external influences play a more substantial role in adherence behavior.

In relation to associated disease 38.5% of the patients have only hypertension whereas 61.5% of them have other associated diseases in which type 2 diabetes mellitus is the most common disease followed by respiratory diseases and renal disease. In similar study it was revealed that most common co morbid disease with hypertension was Diabetes mellitus followed by heart failure then renal impairments. similarly more than 60% of the patients were using combination drug therapy for the treatment of hypertension in which calcium channel blockers group of drug was most commonly used to reduce blood pressure whereas in similar other study it was found that beta blockers were the most commonly used medication followed by calcium channel blockers.[29] similarly more than 60% of the patient were taking medicine on combination therapy which indicates more than one drugs other similar studies done by Zulig LL et al[30] also indicates that taking more than one tablets of medication has significant medication adherence which suggests that combination therapy is more effective in controlling blood pressure.

In this study of the Nepalese population, factors contributing to low adherence include negligence, limited education, inconsistent follow-up visits, misunderstanding of medication instructions, insufficient guidance from healthcare providers, a high prevalence of multiple health conditions, and the complexity of managing multiple medications.

CONCLUSION

In our study we observed that patients were more likely to forget taking medicine were elderly, poorly educated, unemployed, lower income and having additional disease along with hypertension. The major reason for non adherence to antihypertensive medication is lack of knowledge, fear of side effects of medicine, financial burdens, poor communication, Lack of education, forgetfulness and low social support. Patients' perceptions about the duration of their illness, their control over treatment, the benefits of the treatment, family support, and the local availability of medicines and doctors significantly influenced medication adherence. Patients with strong beliefs in treatment efficacy and lower distress tend to be more adherences. Furthermore, enhancing counseling services across the country could raise awareness among patients and their families about hypertension management, including medication adherence. Providing counseling in both hospital and community settings would be beneficial for patients. These results highlight the importance of disease awareness, patient education and perception of illness regarding use of medicine in managing hypertension and preventing further complications.

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CONFLICT OF INTEREST

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