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Socio-Demographic and Lifestyle Factors Influencing Adherence to Anti-Hypertensive Treatment in a Rural Area of Ludhiana, India

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ABSTRACT

Background

Epidemiological transition has caused increase in burden of non-communicable diseases like hypertension especially in developing countries like India which are further responsible for significant number of deaths among patients.Untreated hypertension can lead to numerous complications in patients However, there is inadequate adherence to therapeutical regimen observed among hypertensives with range varying from 19-96% in our country. Hence, this study was done in a rural area of Ludhiana to determine adherence to anti-hypertensive treatment among hypertensive patients and explore various socio-demographic and lifestyle factors associated with adherence

Methodology

A cross-sectional study was conducted among clinically diagnosed cases of hypertension attending OPD at Rural health Training centre, Pohir over 3-month period, aged above 18 years of age and were on treatment for at least 6 months. A pre-designed semi-structured questionnaire was used to assess the patient's socio-demographic profile, treatment seeking behaviour, duration and type of treatment and presence of any complication of hypertension. Life style related habits like consumption of junk food, extra salt and alcohol, smoking and daily physical exercise were also assessed. The patients who took medication for less than 80% of week (≤5days) were considered as non-adherent. Weight and Height of the patients were measured and Body mass index (BMI) was calculated by using formula (weight/height^2). For categorization of BMI, Asia Pacific Classification was used.

Results

Of the 203 total diagnosed cases of hypertension, 184 patients were enrolled in the study, consisting of 104 males (56.5%) and 80 females (43.5%). The mean age of the subjects was 59.9±11.75 years. Among 184 patients, 128 (69.5%) were adherent to treatment regimen and 56 (30.5%) were non adherent. Medication adherence was significantly more among literate as compared to illiterate subjects. On assessing lifestyle related habits of the subjects, it was observed that adherence was significantly higher in patients not consuming alcohol and no extra salt intake and ones with no junk food preference. Also, complications were significantly higher among non-adherent patients (82.8%) as compared to ones who took their medication regularly (45.2%). Among reasons for non-adherence to treatment, the most frequent reasons were discontinuation of medication when feeling well followed by forgetfulness and financial issues amongst others.

Conclusions

Hypertension is becoming a global health issue and is yet a preventable disease if timely and adequately treated. Non-adherence to drug therapy among anti-hypertensives is a matter worth concern. Improving adherence will not only reduce complications and mortality among patients but also improve their quality of life and reduce financial burden. Hence, certain interventions in this regard like health education and behaviour change communication are utmost essential at community level.

Keywords: Adherence; Hypertension; Socio-demographic; Lifestyle

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INTRODUCTION

Hypertension is one of the main causes of premature death and disability worldwide. Globally, around 1.28 billion adults aged 30-79 years, suffer from hypertension [1]. Raised blood pressure is among the most important risk factors for CVDs. Non-Communicable Diseases (NCDs) like hypertension are becoming the primary cause of preventable deaths in India accounting for nearly 63% of total deaths of which 27% are attributed to cardiovascular disease which affect 45% people in the 40-69 age group, indicating a rapid demographic and epidemiological shift in the country [1] [2] The 2019–2021 National Family Health Survey (NFHS-5) reported the overall prevalence of hypertension to be 28.1% of which only around 37% were diagnosed and of these only halves were getting treatment. Of those affected Indians getting antihypertensive treatment, only half were having adequate control over the disease. [3] NFHS-5 survey report shows that more than 90% hypertensive adults in India are undiagnosed, untreated or inadequately treated, if seen cumulatively. [3] Thus, in view of very poor control rate of the disease observed back in the 2015-2016 NFHS - 4 survey, a new program, the India Hypertension Control Initiative (IHCI), was introduced in 2017 as a multi-partner initiative to enhance access to treatment services.This suboptimal control in patients with hypertension along with the complex and multifactorial causation of this NCD exacerbates the situation. In order to reduce prevalence of this disease and protect the patients from its crippling complications, it is critical to evaluate the variables and obstacles affecting its management at the community level. [2] It remains poorly controlled due to various factors such as low awareness, lack of appropriate care through primary care, poor follow-up and non-adherence to medication therapy. Latest data in India shows variable adherence rates ranging from nearly 19 % to 96 % [6]. Adherence if poor can lead to various complications like stroke, congestive heart failure and chronic kidney failure which can further deter the quality of life of patients and add to his financial burden. Concept of adherence is not just in relation to drugs prescription, but also encompasses lifestyle related modifications. World Health Organisation (WHO) defines adherence as "the extent to which an individual's behaviour of taking medication, following a diet, and/or executing lifestyle changes, corresponds with health professional's advised recommendations"[7]. Various factors like patients' socio demographic profile, awareness about disease and treatment and his lifestyle behaviour impact their adherence levels to the treatment. NFHS-5 data shows that the percentage of hypertensives getting diagnosed and treated was higher in urban areas of India as compared to rural settings.[3] In rural areas, certain factors like ignorance towards health, religious and cultural beliefs, the high expense of medications or their adverse drug reactions, inadequate knowledge about the condition and the need for long-term therapy, lack of access to medical care and facilities, and the usage of complementary medicines and practices affect the adherence of patients to their medication regimen and are major issues of concern. Hence, it is essential to specifically understand the significance of impact of various behavioural, clinical, and sociodemographic determinants on the adherence to treatment and identify the barriers. Accordingly, the interventions need to be tailored, in order to address the issue and get better treatment outcomes. Therefore, this research was directed towards ascertaining adherence to their hypertension treatment among hypertensive patients in Ludhiana, Punjab's rural area and its related socio-demographic and lifestyle factors.

Methodology

A cross-sectional study was conducted regarding adherence to anti-hypertensive treatment among patients attending OPD at Rural health Training centre, Pohir over 3-month period. Adult patients above 18 years of age clinically diagnosed with Hypertension with or without co existing morbidity and on treatment for at least 6 months and willing to participate were included in the study.

Exclusion criteria

Patients having difficulty understanding or responding to questions, as well as those with dementia, were excluded from the study.

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Method

A pre-designed semi-structured questionnaire was used to assess the patient's socio demographic variables such as age, gender, marital status and years of education. Questions related to treatment seeking behaviour (if during disease take treatment from healthcare provider/self-medication /faith healer), duration of treatment of hypertension, type of treatment (Allopathic/ Ayurvedic/Homeopathic). Whether monotherapy or polytherapy taken by the patient and presence of any complication due to hypertension was asked. Life style factors like consumption of junk food such as processed food or fried food like fritters, burgers, noodles etc. and its frequency per week, intake of any extra salt i.e., the person consumes extra salt put aside in plate along with meals and regular intake of pickles and packet foods having salt and its frequency per week, consumption of alcohol and smoking habit (no. of cigarettes/ bidis in a day) was enquired from study subjects. Daily physical exercise more than 5 days a week was also asked.Adherence to treatment was assessed by asking them that for how many days they were taking anti-hypertensive treatment/week. The patients who took medication for less than 80% of week (≤5days) were considered as non-adherent. Weight and Height of the patients were measured and Body mass index (BMI) was calculated by using formula (weight/height^2) Height was measured by using non-stretchable tape. Subjects were asked to stand against wall with their shoes removed and heels, buttocks, shoulder and back of head touching the wall. Height was recorded in centimetres. A standard manual weighing scale was used to measure weight. The weighing scale was placed on an even surface and study subject was asked to stand bare foot and minimum clothes at the centre without touching anything and weight was recorded. For categorization of BMI, Asia Pacific Classification was used [8].

Statistical Analysis

Data was entered in excel and analysed using SPSS version 26.0. The quantitative variables were described as mean±SD whereas frequency and percentages were used to describe qualitative variables. Chi square test was performed to assess the association between socio demographic variables and adherence and p value below 0.05 was considered statistically significant

Results

Out of total General OPD patients who visited Rural health centre during study period, 203 were diagnosed cases of hypertension and were on treatment for at least six months. Out of 203, 19 patients refused to participate in the study. Eventually, 184 patients were enrolled in the study. Out of 184 patients, there were 104 (56.5%) males and 80 (43.5%) females. The mean age of the subjects was 59.9 years (±11.75 SD). Majority of the subjects (87.5%) were living with their spouse. Among the 184 patients, 128 (69.5%) adhered to their treatment regimen, while 56 (30.5%) did not (figure 1). It was observed that 70% of the subjects aged more than 40 years were adherent to medication. Gender wise analysis showed that 78 males (75.0%) and 51 females (63.7%) were adherent to treatment and this difference was found to be positively associated with adherence rate among two genders (OR= 1.706) although statistically non-significant (p=0.098). Medication adherence was significantly more (p value 0.002) among literate as compared to illiterate subjects. Patients who were living with their spouse and without spouse had adherence rates of 70.6% and 66.7%, respectively, indicating that marital status had no discernible effect on adherence. (Table 1)

Figure 1: Adherence to anti hypertensive treatment among the study subjects

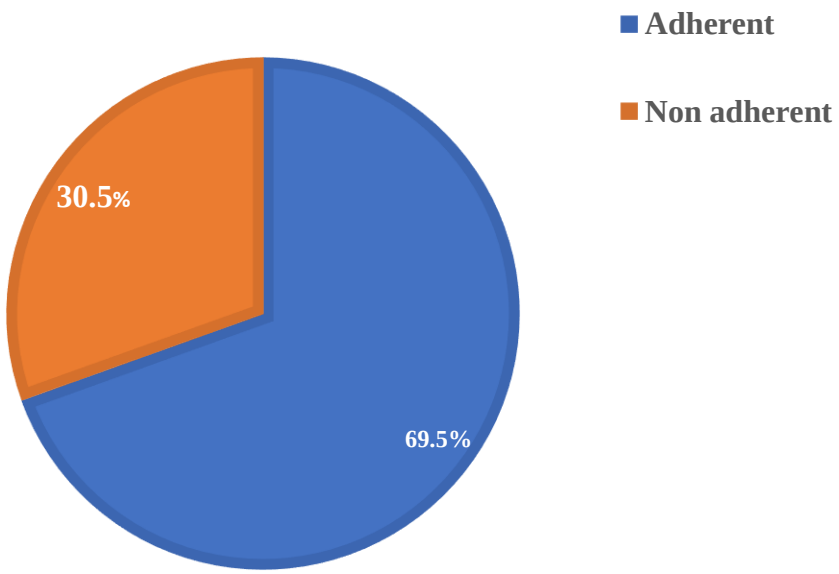


Table 1: Association between socio-demographic variables and adherence to anti-hypertensive treatment

Variables	Total subjects	Adherence N (%)	OR (95% CI)	P value
Age (years)				
≤40	10	6 (60.0%)		0.766
41-60	73	52 (71.2%)		
>60	101	71 (70.3%)		
Gender				
Male	104	78 (75.0%)	1.706 (0.903-3.223)	.098
Female	80	51 (63.7%)		
Education				
Illiterate	79	46(58.2%)	0.369 (0.193-0.707)	.002
Literate	105	83 (79.0%)		
Marital status				
Living with spouse	160	113 (70.6%)	1.202 (0.482-2.999)	0.693
Living without spouse	24	16 (66.7%)		

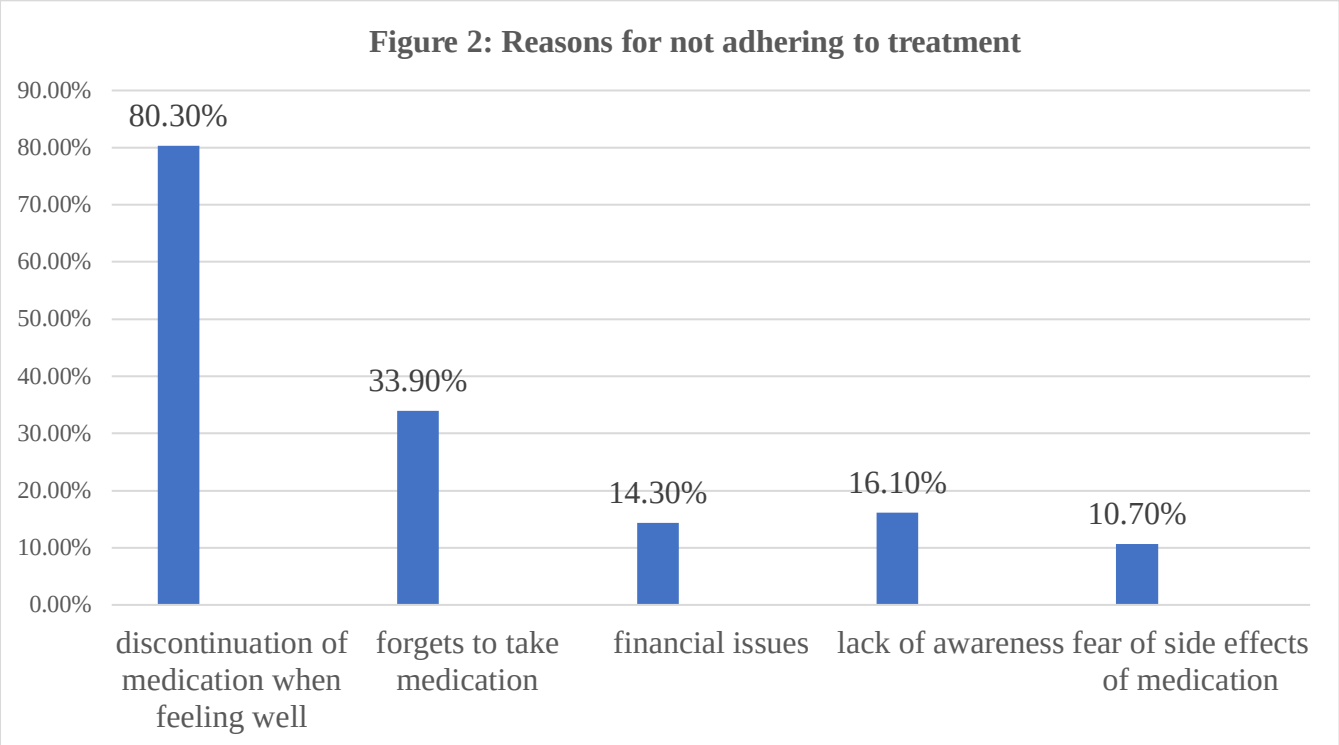
In this study, when lifestyle related habits of the subjects were assessed it was observed that adherence was significantly higher in subjects not consuming alcohol (p= 0.006), ones with no junk food preference (p=0.005) and those with less salt intake (p=0.00). Physical activity was found to be positively associated with higher adherence level (OR= 1.528), however, this association was not found statistically significant (p=0.209) (Table 2).

Another major inference of this study was that complications were more among non-adherent patients (82.8%) as compared to ones who took their medication regularly (45.2%). This association between adherence and presence of complications of hypertension based on self-report or medical records was found to be highly statistically significant (p=0.000)

Table 2- Association of Behavioural Factors with adherence to antihypertensive treatment

Variable	Total Subjects	Adherence	OR (95%CI)	P value
Alcohol consumption				
Yes	32	16(50.0%)	0.345(0.158-0.755)	.006
No	152	113 (74.3%)		
Extra salt intake				
Yes	62	31 (50.0%)	0.245(0.125-0.478)	0.000
No	122	98 (80.3%)		
Junk food consumption				
yes	37	19 (51.4%)	0.355(0.169-0.748)	.005
No	147	110 (74.8%)		
Physical exercise				
yes	73	55 (75.3%)	1.528(0.788-2.964)	0.209
No	111	74 (66.7%)		

When enquired about reasons for taking medication irregularly, the most commonly found reasons were discontinuation of medication when feeling well (80.3%), forgetfulness (33.9%), financial issues (14.3%), lack of awareness (16.10 %) and fear of drug side effects (10.7%) (shown in figure 2).



**Total exceeds N due to multiple responses*

DISCUSSION

Hypertension is an emerging non-communicable disease that, if left untreated, can lead to numerous health complications. Non-adherence to medication therapy among diagnosed cases is a serious issue that requires attention to achieve better treatment outcomes. Therefore, this study aimed to determine the factors influencing adherence to drug therapy among hypertensive patients in a rural area of Ludhiana.In this study, around two third of the study subjects were found to be adherent to their antihypertensive medication regimen which was in concurrence with other studies by Kumaraswamy RC et al, Nagarkar AM et al and Bhandari et al.[9], [10], [11]However, a wide range has been seen in adherence levels among various studies done on people taking antihypertensive drugs. Certain studies like those by Hema K et al [12] in a tertiary care setting in Andhra Pradesh, Vekatachalam J et al [13] in rural area of Tamil Nadu and Misra P et al [14] in North India have shown as low as 15%, 24% and 27% adherence rates respectively, in contrast to 96% adherence levels shown by a study in coastal area of Karnataka by Mallaya SD et al [15]. A study in Ethiopia reported 55.5% adherence and around 44.7% prevalence was reported in Nigeria by Ajayi et al [16], [17]. These differences can be attributed to variations in sociodemographic profile of participants, different assessment tools used having difference in cut-offs, place of study along with differences in study settings i.e. healthcare facility versus community.

As observed in our study, every 7 out of 10 subjects aged 40 years and above were adherent. Similar findings have been reported by Rao BB et al [18] and Varma P et al [19] who showed that adherence rate towards antihypertensive medication was better among patients above 60 years of age (67.2%). Presence of asymptomatic disease as well as negligence towards health because of work related hustle among young adults can be the reason for lower adherence rates. The gender wise distribution in this study showed more male participants than females. The reason can be lower conveyance availability for females in rural setup. Their dependence on male counterparts also restricts their healthcare seeking behaviour. It was noted that adherence in males (75%) exceeded that in females (63.7%). Our results were in conformity with studies by Tabassum et al [20], Ahmad S et al [21] and Varma P et al [19] which reported higher adherence among males than females. It was also likely that women

being consumed with daily household chores, taking care of their children and other members of the family, tend to miss their medication dosages more often.

Literacy played a positive role in increasing adherence to medication. As seen in our study, literacy was significantly associated with adherence (OR=0.369, p=0.002). Other studies by Punna S et al [22], Raja W et al [23], Shiraly et al [24] also reported similar association between these two variables. It is highly likely that the educated section of population better understands about the disease and its implications on health when explained by the healthcare provider. Thus, they are more likely to stick to their treatment strictly. In congruence with the present study, Venkatachalam J. et al [11] also observed that there was no significant association between marital status and adherence.One major inference noted in this study was that patients with better adherence had less complications as compared to non-adherent subjects which was in line with results of study by Varma P et al [19]. Better control over the disease in these patients helps avoid development of complications early in life , thereby improving their quality of life and reducing financial costs which otherwise becomes a major burden for patients who develop coronary heart diseases, stroke or other cardiovascular disorder.

Lifestyle related habits are an important determinant in development of NCDs like hypertension and their modification play a pivotal role in its prevention as well. In this study, adherence was found higher among patients who had incorporated lifestyle modifications in their lives such as no alcohol consumption, low junk food preference and no extra salt intake. Although physical exercise is also highly recommended as a preventive lifestyle measure, the association was not statistically significant in our study. A similar picture was seen in study by Balasubramanian A et al [7] in rural Kerala and Venkatachalam J et al [13] in rural area of Tamil Nadu where significant association between no alcohol consumption and adherence was noted. The possible reason could be that people with poor lifestyle choices like alcoholics or those with high preference for junk food, are less conscious regarding their health and may forget to take the medication on recommended time or may not even consider it important to do so. This in turn leads to increased risk of heart diseases, stroke, kidney damage as well as visual impairment in these patients with inadequately managed hypertension.

Among the identified reasons behind lack of adherence in study participants,commonest was discontinuation of medication when feeling well followed by forgetfulness , financial constraints and others like lack of awareness and fear of side effects of drugs. Similar determinants influencing the adherence to treatment were identified in the study by Tabassum et al [20] which reported which reported around one third of the subjects cited forgetfulness as main reason followed by financial restrictions. In Kuwait, another study carried out by Al-Mehza AM et al [25] reported factors responsible for non-compliance as drug side effects, shortage of drugs, etc.

CONCLUSION

As observed in the present study, approximately one-third of the subjects were non-adherent to their anti-hypertensive treatment. . Poor adherence can lead to various adverse outcomes, increasing an individual's healthcare costs.Hypertension is a controllable disease that requires a holistic management approach.Multifaceted interventions are needed at both administrative and community levels. Poor control of hypertension can be overcome primarily by improving adherence to medication. Health education and behaviour change communication in the community are essential measures required. Patients should be made aware of the risk factors, early signs, and symptoms of these NCDs through awareness campaigns.. Those diagnosed should be informed by their treating physician of the chronic nature of the illness and the significance of consistently adhering to both pharmaceutical and non-pharmacologic measures like lifestyle changes. Additionally, the patients should be made aware of the side effects of the available drugs and how the overall advantages outweigh them. Easy accessibility and availability of the medications by reduction in prices of drugs and increase in supply in remote areas must be ensured by the administration as well. The inclusivity of primary healthcare which includes cost of visits and testing in various government insurance schemes and health programs is required. The National Programme for Prevention and Control of Non-

Communicable Diseases (NPNCD) should also cover the patients going to private practitioners. Furthermore, traditional medicine practitioners trained through bridge programmes can also be engaged in providing primary healthcare in rural settings to combat the issue of lack of healthcare staff in these areas.

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