

# Factors affecting non-adherence to medical appointments among patients with hypertension at public health facilities in Punjab, India

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## Abstract

Daily adherence to antihypertensive medications is necessary to control hypertension. Under the State hypertension control program, hypertensive patients are enrolled in public health settings, provided with 30-day medication prescriptions, and advised to return to the health facility monthly. However, at least 50-60% of patients do not visit the health facility for their scheduled follow-up appointments. The authors aimed to document the major reasons for missed appointments and to characterize patient and health system barriers. By telephone, we interviewed 300 randomly selected patients who missed appointments for more than three consecutive months. Out of the 300, 206 were interviewed using a pre-structured questionnaire to explore patients' experiences along with medical record reviews from the patient database. Not feeling sick or not experiencing any symptoms (24.8%) was the major reason why patients did not return to the clinic, followed by far distance from the facility (22.3%). Among other reasons for missing follow-up appointments, lack of instructions/guidance from the facility (15.3%), acute illness among patients (8.3%), and long waiting time at the facilities (7%) were also documented. Most of these patients (55.4%) continued treatment from other sources, and a majority (54%) preferred private clinics. These results suggest the need for a more patient-centered care model, including education about hypertension as an asymptomatic but life-threatening condition and addressing the barrier of travel distance between a patient's home and the health facility. Further, introducing a reminder system using telephone calls, text messages, or home visits by health workers may increase the follow-up rate among patients.

## 1 | INTRODUCTION

Hypertension is the most important risk factor for cardiovascular disease (CVD).<sup>1</sup> It is a major cause of death worldwide and the second leading cause of disability. Globally, systolic hypertension

alone is estimated to cause 7.5 million deaths, representing approximately 12.8% of all deaths. This accounts for 57 million disability-adjusted life years (DALYs) or 3.7% of total DALYs.<sup>2</sup> Therefore, maintaining blood pressure control is key to preventing premature deaths due to CVD. Population-based strategies aimed at lowering blood pressure by reducing salt intake, increasing

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potassium intake, reducing weight, and increasing physical activity, while simultaneously taking antihypertensive medications regularly help to reduce the occurrence of stroke, heart failure, and heart attack.<sup>3</sup>

In India, it is estimated that the overall prevalence of hypertension is approximately 25.3% and the proportion of patients with controlled hypertension is very low (below 10%).<sup>4-6</sup> The Ministry of Health and Family welfare, India in collaboration with state government<sup>7</sup> of Punjab implementing hypertension control program with the aim of controlling blood pressure and thus preventing cardiovascular mortalities and morbidities.

The program initiated at public health facilities with screening of all adult patients coming to outpatient departments of the facility and prescribing antihypertensive medications for a month after patients diagnosed to have high blood pressure. At the time of our study, approximate 14 000 patients were registered across forty public health facilities at district Bathinda, Punjab, where the present study was conducted.

As per the program, medications for diagnosed hypertensive patients are always dispensed at the health facility by a medical doctor. Thereafter, follow-up prescriptions (generally monthly) are dispensed by trained paramedical staff if the blood pressure is under control, while patients with uncontrolled blood pressure are referred to the doctor for dosage modification. Patients are registered as close to their residence as possible for better continuity. Dates for medical appointments are given in general 30 days from the date of the last visit, and the appointment consists of blood pressure measurement and medicine collection along with a brief educational session or counseling by health care providers.

Following registration, the patient is provided with a blood pressure passport which mentions details of the visit and the date of the next visit, along with patient details that are entered into the digital recording system on mobile telephones used by the facility staff. Patients who miss medical appointments appear consecutively in the overdue list shown on the screen of the application and are eligible for calling through a secure or normal line by the staff.

Over time, the program has shown that a large proportion (approximately 50%) of registered patients fail to maintain regular appointments at public health facilities, thus leading to a significant decrease in the proportion of patients with controlled hypertension. As the continuity of appropriate treatment is a major factor for achieving adequate blood pressure control, the proportion of patients with missed visits significantly challenges the program in achieving its objectives. The present study explored the various reasons behind missed appointments using a combination of available information, perspectives, and experiences of hypertensive patients who missed their scheduled visits at public health facilities for more than three consecutive months. Specifically, we aimed to establish whether missed appointments are indicative of loss to follow-up and to characterize the patient and health system factors linked to missed appointments.

## 2 | METHODS

### 2.1 | Study design

We applied the telephonic interview method to determine patients' experiences, perceptions, and feelings. We also reviewed the medical records of the patients. The data were collected during 2019-2020 after obtaining ethical clearance and permission to research the relevant structures within the District Health Society of the Government of Punjab.

### 2.2 | Characteristics of the patient population

The present study was conducted in the Bathinda district of Punjab province, India. Although the utilization rate of public health facilities in the state is about 18%, there is no available evidence of the utilization of such facilities by patients with chronic diseases.<sup>8</sup>

### 2.3 | Selection of patients

In 2019, the program enrolled approximately 14 000 hypertensive patients through the State Government's existing health care systems (ie, primary health centers, public Dispensaries, community health centers, sub-divisional hospitals, and divisional/district hospitals) in both urban and rural areas. Hypertensive patients were diagnosed and registered by qualified health workers and treatment was initiated by a medical professional, along with recording patients' details and clinical parameters in the digital record system and providing blood pressure passports containing details of the visit (blood pressure control status, medications prescribed, and next visit dates). For the purposes of sampling, about 4952 patients who had missed their appointments for more than three consecutive months in the entire district were selected from the existing records. From this patient list, those who did not have telephone numbers were excluded. From the list of remaining patients, 300 patients were selected as a convenient sample. The medical records were reviewed for the sample population obtained from a well-functioning digital health record. Data regarding the demographic characteristics of the patients (age, sex, facility type) were also obtained.

We targeted patients who had missed their appointments for at least three months. The tool used in this phase pretested and enabled us to obtain reasons for the most important factor of missed appointments and to contextualize patient behavior beyond the immediate reasons for missing appointments. As such, we profiled patients' illness experiences, access to services and/or information, self-treatment, treatment experience, social support, and financial constraints as any one or all of these factors might influence behavior. The tools were tested in a previous study and subsequently refined. Data were evaluated via both statistical analyses and textual descriptions.

### 3 | RESULTS

Of the 300 selected patients, 206 participated in the interview (response rate = 69%). The major reasons behind unresponsiveness were invalid/incorrect telephone numbers ( $n = 29$ ) and telephone numbers not reachable/switched off ( $n = 59$ ), while others were death ( $n = 4$ ) and unwillingness ( $n = 2$ ). During the interview, it was found that for some patients, follow-up visits sometimes were not recorded by the facility staff resulting in many patients being wrongly counted in "missed visit" category. Forty-nine (23%) patients were found in this category and were excluded from the analysis.

The characteristics of the study participants are presented in Table 1. Most of the patients enrolled in the present study were females (59.9%), which aligns well with the characteristics of the general registration of hypertensive patients in the state, in that the number of female patients exceeds that of their male counterparts. Most of the patients (52.2%) were older than 50 years, and the enrollment rates of patients were 29.9%, 46.5%, and 23.6%, respectively, in community health centers, district and sub-district hospitals, and primary health centers or similar facilities.

Among patients who missed appointments, the most important reason was the absence of perceived illness or feeling sick, which was the reason for missing the follow-up visit in 24.8% of patients (Table 2). Other factors were the distance between the patient's residence and the facility (22.3%) and the lack of proper guiding instructions by the facility staff, whereby patients were not properly instructed on when and where to come for a follow-up visit (15.3%). Besides the above-mentioned reasons, some other factors reported as the cause of discontinuing follow-up visits were acute illness/disability (8.3%), long waiting periods at the facility (7%), medication quality (6.4%), and being demotivated by others (6.4%).

Although no significant differences were observed among male and female patients, it could be seen that the common reasons mentioned by the older age-group (such as the distance-to-facility factor, 69%) were relatively less common among their younger counterparts (31%). Participants in the younger age-group also

**TABLE 1** Demographic characteristics of the study population (N = 157)

|   | Number of patients | Percentage |
|---|--------------------|------------|
| Sex   |                    |            |
| Male  | 63                 | 40.1       |
| Female  | 94                 | 59.9       |
| Age, years                                      |                    |            |
| ≥50   | 82                 | 52.2       |
| <50   | 75                 | 47.8       |
| Registration facility                           |                    |            |
| District/sub-district hospital                  | 47                 | 29.9       |
| Community health center                         | 73                 | 46.5       |
| Primary health center/rural hospital/dispensary | 37                 | 23.6       |

**TABLE 2** Reasons behind non-adherence to follow-up visits (n = 157)

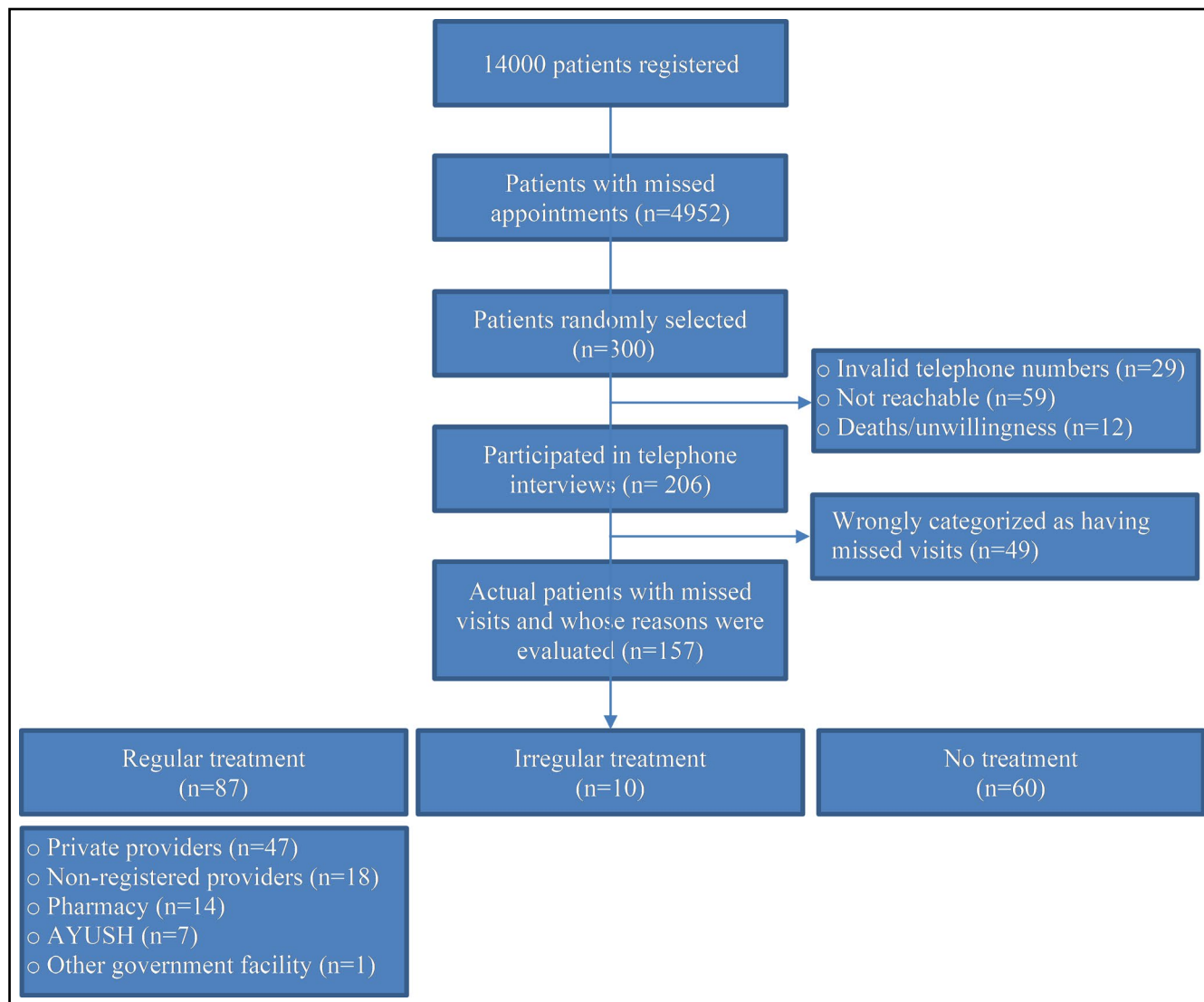
| Reasons  | Number of responses (n = 157) | Percentage (%) |
|--|-------------------------------|----------------|
| Lack of perceived illness                        | 39                            | 24.8           |
| Distance from home                               | 35                            | 22.2           |
| Lack of guiding instructions/reminders           | 24                            | 15.2           |
| Acute health conditions/disability               | 13                            | 8.2            |
| Long waiting hours at clinics                    | 11                            | 7.0            |
| Poor quality of medications at public facilities | 10                            | 6.3            |
| Convinced by others                              | 10                            | 6.3            |
| No time for a visit                              | 8                             | 5.0            |
| Other required medicines not available           | 7                             | 4.4            |
| Total responses                                  | 157                           | 100            |

**TABLE 3** Reason for not following up according to age-group (n = 157)

|  | Number of responses | Percentage | p-value     |
|--|---------------------|------------|-------------|
| Facility too far from home (n = 35)                |                     |            |             |
| Age ≥ 50 years                                     | 24                  | 68.5%      | <.05 (.028) |
| Age < 50 years                                     | 11                  | 31.4%      |             |
| Lack of perceived illness (n = 39)                 |                     |            |             |
| Age ≥ 50 years                                     | 13                  | 33.3%      | <.05 (.006) |
| Age < 50 years                                     | 26                  | 66.6%      |             |
| Lack of proper instructions for follow-up (n = 24) |                     |            |             |
| Age ≥ 50 years                                     | 10                  | 41.6%      | >.05 (.26)  |
| Age < 50 years                                     | 14                  | 58.3%      |             |

did not consider hypertension as a serious illness or even as an illness (67%), compared to those in the older age-group (33%). Lack of proper guidance or instructions from the facility was most frequently reported by the younger age-group (58%) than the older age-group (42%), but there were no significant differences in these proportions (Table 3).

Another finding of the present study was that although the patients did not show up for the follow-up visits at the public health facilities, a majority of them (55.4%) claimed that they continued receiving their treatment from some other sources, which were mostly private health care providers (54%), non-registered practitioners (21%), local pharmacy shops (16%), and AYUSH practitioners (8%) (Figure 1).



**FIGURE 1** Flow diagram of study participants | AYUSH: Ayurveda, Yoga and naturopathy, Unani, Siddha, and homeopathy

**TABLE 4** Reasons according to the treatment status of patients with missed appointments (N=147).

| Treatment status (n=147)        | Main reason               | Number of responses | Percentage |
|---------------------------------|---------------------------|---------------------|------------|
| Continuing treatment (n=87)     | Distance                  | 30                  | 34.4%      |
| Not continuing treatment (n=60) | Lack of perceived illness | 39                  | 65.0%      |

We also analyzed a variety of reasons among patients who continued treatment versus those who did not. The distance factor turned out to be the most important reason (34.4%) among those who were continuing treatment (n = 87), while the lack of perceived illness (65%) was the most important reason among those who did

not continue treatment (n = 60). The frequencies of both factors were found to be significantly different between the two groups (Table 4).

## 4 | DISCUSSION

The present study documented the major factors affecting adherence to medical appointments among hypertensive patients enrolled in the hypertension control program at public health facilities in Punjab, India. Missing follow-up visits are already known to be associated with poor blood pressure control, and our study explored the reasons why patients missed follow-up visits.<sup>9</sup> The major reason identified in our study was the lack of perceived illness by patients as hypertension is mostly an asymptomatic condition, for which reason approximately one-fourth (24.8%) of our patients underestimated the importance of visiting health facilities

and taking antihypertensive medications regularly. This was particularly prevalent among younger patients. Many people believe that they do not need antihypertensive medications because they have no symptoms. Previous studies have also mentioned that this belief is more prominent among younger patients, similar to our findings.<sup>10</sup> Patients expressed fear of "dependence" on antihypertensive medications if they continue to take them, as evidenced in previous studies,<sup>11</sup> similar findings were seen in the present study where patients were convinced by others (family members, influential bodies in communities, quack practitioners) not to take their antihypertensive medications due to fear of side effects or dependence. All these factors indicate that the lack of knowledge regarding hypertension and its consequences, perceived lack of symptoms, perceived side effects or dependence encourages many patients to discontinue treatment, and an efficient and customized behavior change communication model may be beneficial.

Distance to the facility was also a major reason why patients did not show up for follow-up visits (22.3%) and seemed to be more important among patients who were older or had some form of acute illness or disability, as seen in the present study. A similar study has shown that more proximity can make tracing more feasible for those receiving antiretroviral therapy.<sup>12</sup> With the advancement of a decentralized model of service delivery for chronic care, this can be minimized because decentralized clinics tend to be closer to patients' homes, requires them to travel less, reduces transportation costs, and builds stronger links between health services and the community. At any point in time, we need to consider special situations such as patients who are too old, have comorbid illnesses, or have other chronic conditions or disabilities to arrive at treatment strategies that suit them and plan accordingly. In addition, the enhancement of community outreach services through several mechanisms, such as involving community health workers, utilizing existing community health platforms might improve retention over time.

In the present study, a lack of guidance from the facility (by not guiding patients about the next visit dates or not writing in the cards) was a reason why many patients missed visits (15.3%), similar to findings observed in other studies<sup>12</sup> conducted in Northwest Ethiopia, Malawi, and Kenya. A study on the follow-up of patients with chronic diseases conducted in South Africa showed that forgetting to collect medication may be due to a lack of instruction from the facility or an inadequate reminder process and resulted in missed appointments.<sup>13</sup> So guiding patients properly at the health facility, giving written instructions to patients and addition of reminder systems might have positive impact on patients' follow-up visits.

In our study, health facility factors, such as long waiting time (7%), perceived poor quality of medication (6.4%), and lack of other required medication (4.5%), were a reason why some patients opted for other avenues for collecting medicines rather than come to public health facilities. A long waiting time at the facility leading patients to avoid the visit has also been documented in other studies.<sup>13,14</sup> However, these factors can be avoided by managing patient flow at the facility and making the required medication available by properly calculating the demand beforehand.

Some patients also complained of not being able to take out the time for visiting the health facilities (5%). This reflected the lack of priority of hypertension as a serious illness as evidenced by other patients. Also, it revealed the need of flexible clinic time schedules for addressing such patients.

Eighty-seven (55.4%) of the 157 patients interviewed continued their treatment at facilities other than government health facilities, particularly if they complained about a long distance to the government health facility. Private health care providers were the most important source of treatment in our study (54%). This is also similar to the findings of other studies conducted abroad and in India.<sup>15,16</sup> In India, alternative systems of medicine such as Ayurveda, homeopathy, Unani, Yoga, and home remedies are often utilized by a large proportion of the population, resulting in missed follow-up visits at public hospitals, in our study 8% patients are depending on AYUSH practitioners for their treatment. Self-treatment with alternative medications sourced through informal providers (herbalists and traditional healers) was also reported in another study.<sup>13</sup> In our study, 21% of patients continuing medication, particularly in rural areas, depended on unregistered practitioners for the same due to time constraints and distance issues. All these studies indicate the need for a properly managed system at public facilities, thus decreasing the need for out-of-pocket expenditure and building trust in the public health system. If at all patients choose private facilities over public facilities, there is a need to ensure that they have all the necessary information regarding facilities available at government hospitals. It is also important to develop a simple recording system so that each patient's blood pressure can be tracked for necessary actions when needed.

An important finding of our study was that patients' follow-up visits that were not being recorded sometimes by the facility staff resulted in many patients being wrongly classified as "defaulters" or lost to follow-up. About 23% of patients contacted had been categorized as having missed visits, although the patients had come to the facility to collect their medications on the date of follow-up or later, as confirmed by the patient during the telephone call for interview purposes. The results indicated the need to distinguish between true defaulters and others who were misclassified as a result of inefficient facility processes as it causes the unnecessary allocation of resources and inappropriate evaluation of medicines and other logistics. A similar trend persists in other programs, as mentioned in previous studies.<sup>13</sup> Although the study was conducted at a time when the digital system was newly implemented, the issue of not recording information in the system was a gross finding at all levels; however, with the advancement of the program, this error is expected to be minimized.

## 5 | LIMITATIONS

The present study also had some limitations, as many of the patients could not be reached because their telephone numbers were invalid or incorrect. Many of the older patients could not participate in

the interview, and information was obtained from their children or relatives, which may have introduced some bias. Although we only inquired about the most important reason for missing follow-up appointments, patients might also have multiple reasons for missing follow-up appointments. In addition, we could not differentiate between qualified private service providers and unqualified providers as the patients' perceptions were unclear most of the time. We could not assess the effectiveness of the treatment who are continuing it from other sources, and it could have only been possible by in-person interview with measurement of blood pressure. Lastly, the sample assessed in the present study may not represent the entire population of hypertensive patients, and there is always a difference between information obtained via telephone and in-person interviews that cannot be ignored.

## 6 | CONCLUSIONS

The present study was part of a service improvement process, and the findings are disseminated to relevant stakeholders for the implementation of effective actions. We highlighted the roles of social and system factors in contributing to the burden of missed follow-up appointments. There is a need for a more patient-centered care model to improve patient information collection, guide the patient properly at the health facility, save patients' time at the clinic, provide personalized care for acutely ill and older patients, and address distance barriers between a patient's home and the health facility. Further, introducing a reminder system utilizing telephone calls/short message service/home visits may help to increase the follow-up rate among patients. Based on our findings, we recommend the need to develop a model of care that reflects the local context with an easily accessible, reliable, and quality means of service delivery. In addition, attention should be given to a more decentralized model of service delivery and strengthening information systems for early detection and management of missed visits among patients, thereby building a more reliable service delivery model. By so doing, we will be able to reduce out of the pocket expenditure and thus achieve our objective of blood pressure control.

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## CONFLICT OF INTEREST

None.

## AUTHOR CONTRIBUTIONS

BD and GS conceived and designed the study. BD and DN provided supports in designing the tools and making critical revisions. BD and DN wrote the manuscript, performed the data analysis, and critically revised the text. GS and SG provided guidance and technical inputs. All authors approved the final version of the manuscript.

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None.

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