

Prescription Understanding and Associated Factors Among Patients Attending a Rural Community Health Centre in Uttar Pradesh, India: A Cross-Sectional Study

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Background: Inadequate prescription understanding is a major public health concern that contributes to medication non-adherence, treatment failure, and adverse drug events, particularly in rural populations. Evidence on prescription comprehension among patients attending rural healthcare facilities in India remains limited. This study assessed prescription understanding and its associated factors among patients attending a rural Community Health Centre (CHC) in Uttar Pradesh.

Methods: A facility-based cross-sectional study was conducted among 330 adult outpatients attending a rural CHC from January to March 2026. Participants were selected using systematic random sampling. Prescription understanding was assessed through structured exit interviews covering six components: drug name, dose, frequency, duration, timing with food, and special instructions. Understanding scores were categorized as good ($\geq 75\%$), moderate (50–74%), or poor ($< 50\%$). Factors associated with poor prescription understanding were assessed using multivariable logistic regression and reported as adjusted odds ratios (AORs) with 95% confidence intervals (CIs).

Results: The majority of participants were aged 30–44 years (32.7%), male (53.3%), and rural residents (78.2%). Overall, only 23.0% of participants demonstrated good prescription understanding, while 46.1 and 30.9% had moderate and poor understanding, respectively. Domain-specific comprehension was highest for treatment duration (60.9%) and lowest for special instructions (38.2%). In the multivariable analysis, illiteracy (AOR = 5.2; 95% CI: 2.1–12.8), absence of prescription counselling (AOR = 3.4; 95% CI: 2.0–5.8), polypharmacy (medicines) (AOR = 2.6; 95% CI: 1.5–4.4), age years (AOR = 2.3; 95% CI: 1.2–4.5), and rural residence (AOR = 1.7; 95% CI: 1.0–3.0) were independently associated with poor prescription understanding.

Conclusion: Prescription understanding among patients attending the rural CHC was suboptimal. Illiteracy, older age, polypharmacy, rural residence, and a lack of structured prescription counselling were significant independent predictors of poor comprehension. Strengthening point-of-care patient counselling and adopting literacy-sensitive communication strategies are crucial to improving medication safety in rural settings.

Introduction

Medication safety is a cornerstone of effective healthcare delivery, and the ability of a patient to correctly understand their prescription is a fundamental prerequisite for safe and effective pharmacotherapy. The World Health Organization (WHO) has identified medication errors as a leading cause of preventable harm, with an estimated global cost exceeding USD 42 billion annually.¹ In this context, prescription comprehension encompassing the accurate understanding of drug name, dose, frequency,

duration, timing, and special precautions — serves as the primary interface between the prescribing clinician and patient self-management.

In developing countries, suboptimal health literacy and low educational attainment render prescription misunderstanding particularly prevalent. Studies from sub-Saharan Africa and South Asia have consistently demonstrated that a substantial proportion of patients are unable to correctly interpret their prescriptions, with rates of adequate understanding ranging from as low as 20 to 60% depending on the setting and population.^{2,3}

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In India, the problem is compounded by multilingual prescriptions, the multiplicity of drug brands, and the frequent mismatch between the language of prescription writing and the patient's native tongue.

The Indian public health system relies heavily on Community Health Centres (CHCs) as the backbone of rural secondary healthcare, each catering to a population of approximately 80,000–120,000 people.⁴ However, CHCs are characterised by high patient loads, short consultation durations, and limited pharmacist-patient interaction factors that collectively heighten the risk of prescription misinterpretation. Despite the scale and importance of CHC-level care, evidence regarding prescription comprehension at these facilities in India remains sparse.

Several Indian studies have assessed medication understanding at district hospitals and primary health centres, but community health centre-specific data from Uttar Pradesh a state accounting for 16.9% of India's total disease burden are conspicuously lacking.⁵ Uttar Pradesh carries a disproportionate burden of illiteracy and health system challenges, making it a priority setting for such an investigation. The present study was therefore conducted to assess the level of prescription understanding among adult OPD patients attending CHC Saifai, Etawah, and to identify sociodemographic and prescription-related determinants of poor comprehension.

Methods

Study Design and Setting

This was an observational, facility-based cross-sectional study conducted at the Community Health Centre (CHC), Saifai, Etawah district, Uttar Pradesh, India. The facility caters primarily to a rural population residing in and around Etawah district.

Study Duration

Data collection was carried out over a period of three months from January 2026 to March 2026.

Participants

All adult patients (≥ 18 years) who received a prescription during the OPD visit and provided written informed consent were eligible for inclusion. Patients who were severely ill, had cognitive or communication impairment, or were attending for follow-up with the same unchanged prescription were excluded.

Sample Size and Sampling

The sample size was estimated using the formula $n = 4pq/d^2$, where p = prevalence of adequate prescription

understanding (assumed 25% based on prior literature) (6) $q = 75\%$, and $d = 5\%$ (absolute precision). This yielded a minimum of 300 participants; after adding 10% for non-response, the final sample size was 330. The average daily OPD attendance was approximately 110 patients. Over 30 working days, the expected total patient load was approximately 3,300. The sampling interval (k) was thus $3,300 \div 330 = 10$. Every 10th eligible patient was selected; the first participant on each day was chosen by lottery from the first 10 patients. In cases of non-response or ineligibility, the next eligible patient was included.

Data Collection Tool

Data were collected using a predesigned, pretested, semi-structured interview schedule developed following a review of relevant literature on prescription comprehension and medication literacy. The questionnaire comprised sections on sociodemographic characteristics, prescription-related variables, and assessment of prescription understanding.

The questionnaire was translated into Hindi and back-translated into English to ensure linguistic consistency. Validation of the instrument was carried out through pilot testing among 30 adult patients attending a neighbouring primary health centre who were not included in the final study. The pilot study assessed the clarity, comprehensibility, acceptability, and feasibility of the questionnaire. Based on participant feedback, minor modifications were made to improve wording and ease of understanding.

The reliability of the prescription understanding scale was assessed using Cronbach's alpha, which demonstrated acceptable internal consistency (Cronbach's alpha = 0.78). Following validation and pretesting, the final questionnaire was administered through interviewer-conducted exit interviews immediately after consultation and dispensing of medications using a standardized protocol.

Assessment of Prescription Understanding

Prescription understanding was assessed across six components per drug: (i) drug name/purpose, (ii) dose, (iii) frequency, (iv) duration, (v) timing with food, and (vi) special instructions. Each component was scored as correct (2 points), partial (1 point), or incorrect (0 points). For standardization, only the first two drugs per prescription were evaluated (maximum score: 24 points). Scores were converted to percentages and categorized as good ($\geq 75\%$), moderate (50–74%), or poor ($< 50\%$). For prescriptions with < 2 drugs, only available drugs were scored proportionally.

Table 1: Socio-demographic profile of participants (N = 330)

Variable	Category	n (%)
Age (years)	18–29	72 (21.8)
	30–44	108 (32.7)
	45–59	89 (27.0)
	≥60	61 (18.5)
Sex	Male	176 (53.3)
	Female	154 (46.7)
Residence	Rural	258 (78.2)
	Urban	72 (21.8)
Education	Illiterate	68 (20.6)
	Primary	84 (25.5)
	Secondary	103 (31.2)
	Graduate and above	75 (22.7)
Occupation	Homemaker	88 (26.7)
	Farmer/labourer	97 (29.4)
	Govt./Private employee	74 (22.4)
	Student/Unemployed	71 (21.5)

Statistical Analysis

Data were analysed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were expressed as frequencies and percentages. Associations between categorical variables and poor prescription understanding were first assessed using the Chi-square test. Variables found to be significant in bivariate analysis were entered into a multivariable logistic regression model to identify factors independently associated with poor prescription understanding. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported, and $p < 0.05$ was considered statistically significant.

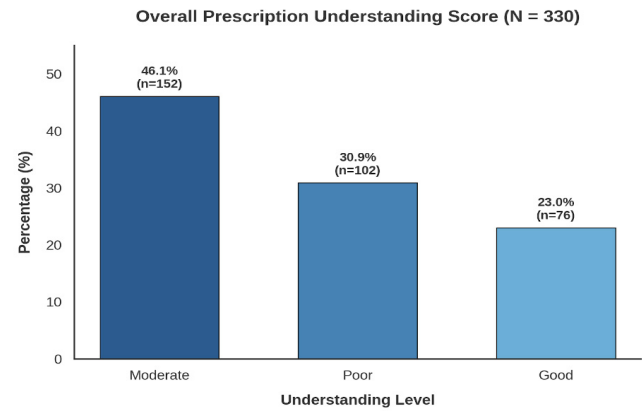
Ethical Considerations

The study was approved by the Institutional Ethics Committee of Uttar Pradesh University of Medical Sciences, Saifai (120/2024-27). Written informed consent was obtained from all participants.

Results

Sociodemographic Characteristics

A total of 330 participants were included in the study. The largest proportion belonged to the 30–44-year age group (32.7%), followed by 45 to 59 years (27.0%). Males constituted 53.3% of the study population, and 78.2% were rural residents. Regarding educational status, 20.6% were illiterate, 25.5% had primary education, 31.2% had

**Figure 1:** Overall prescription understanding among study participants (N = 330).

secondary education, and 22.7% were graduates or above (Table 1).

Component-wise Prescription Understanding

Prescription understanding varied across different components. Correct understanding was highest for treatment duration (60.9%), followed by drug name (55.8%) and dose (51.8%). In contrast, correct understanding was lowest for special instructions (38.2%) and timing of medication with food (44.8%). Poor understanding was most frequently observed for special instructions (35.5%) and timing with food (30.6%) (Table 2).

Overall Prescription Understanding

Among the 330 participants, 76 (23.0%) demonstrated good prescription understanding, 152 (46.1%) had moderate understanding, and 102 (30.9%) had poor understanding (Figure 1).

Association Between Educational Status and Prescription Understanding

Prescription understanding improved progressively with increasing educational attainment (Figure 2). Poor

Table 2: Understanding of prescription components (N = 330)

Prescription component	Correct understanding n (%)	Partial understanding n (%)	
Drug name	184 (55.8)	82 (24.8)	64 (19.4)
Dose	171 (51.8)	89 (27.0)	70 (21.2)
Frequency	163 (49.4)	94 (28.5)	73 (22.1)
Duration	201 (60.9)	74 (22.4)	55 (16.7)
Timing with food	148 (44.8)	81 (24.5)	101 (30.6)
Special instructions	126 (38.2)	87 (26.4)	117 (35.5)

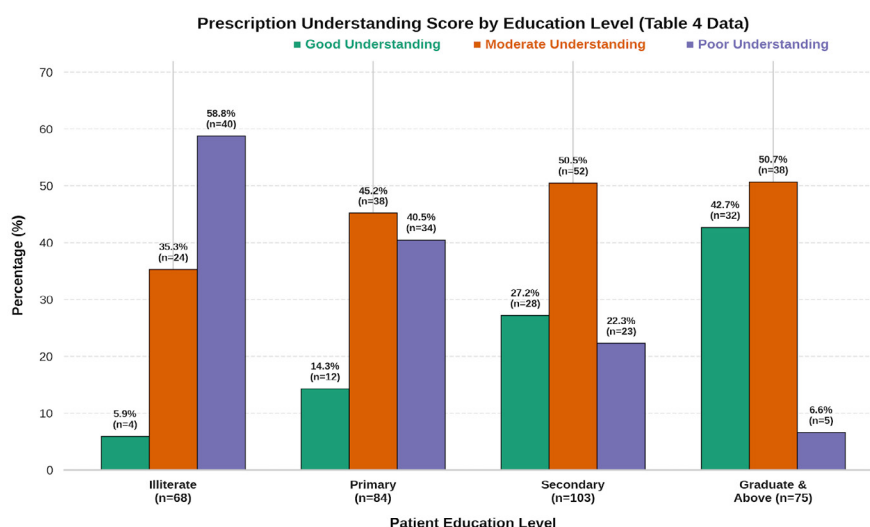


Figure 2: Overall understanding by education level

understanding was observed among 58.8% of illiterate participants, compared with 40.5% of those with primary education, 22.3% of those with secondary education, and 6.6% of graduates and above. Conversely, the proportion of participants with good understanding increased from 5.9% among illiterate individuals to 42.7% among graduates and above.

Factors Associated with Poor Prescription Understanding

In multivariable logistic regression analysis, illiteracy, absence of prescription counselling, polypharmacy,

Table 3: Multivariable logistic regression analysis of factors associated with poor prescription understanding

Variable	Category	AOR	95% CI	p-value
Education	Graduate and above	1.00	Reference	—
	Secondary	1.8	0.7–4.2	0.180
	Primary	3.1	1.3–7.4	0.010
	Illiterate	5.2	2.1–12.8	<0.001
Age	<60 years	1.00	Reference	—
	≥60 years	2.3	1.2–4.5	0.015
Residence	Urban	1.00	Reference	—
	Rural	1.7	1.0–3.0	0.048
Number of medicines	<3 medicines	1.00	Reference	—
	≥3 medicines	2.6	1.5–4.4	<0.001
Counselling received	Yes	1.00	Reference	—
	No	3.4	2.0–5.8	<0.001

*Statistically significant ($p < 0.05$)

age ≥60 years, and rural residence were independently associated with poor prescription understanding (Table 3). Illiterate participants had higher odds of poor understanding compared with graduates and above (AOR=5.2; 95% CI: 2.1–12.8), while participants who did not receive counselling also had increased odds (AOR=3.4; 95% CI: 2.0–5.8).

Discussion

The present study demonstrated that prescription understanding among patients attending a rural Community Health Centre was suboptimal, with only 23.0% of participants exhibiting good comprehension, while nearly one-third had poor understanding. Effective medication use depends not only on access to healthcare services but also on the patient's ability to correctly interpret and follow prescription instructions. Inadequate understanding may lead to medication errors, poor adherence, treatment failure, and adverse drug events, particularly in resource-constrained rural settings where opportunities for follow-up counselling are often limited.¹⁻³

Among the various prescription components assessed, understanding was highest for treatment duration and lowest for special instructions. Patients may find duration easier to recall because it is frequently emphasized during consultations and often relates to familiar treatment courses. In contrast, special instructions such as precautions, storage conditions, or drug-specific advice are more complex and may receive less attention during brief clinical encounters. Similar patterns have been reported in studies examining medication literacy and patient comprehension, where

precautionary information is often the least understood component of a prescription.³⁻¹⁰

Educational status emerged as one of the most important determinants of prescription understanding. A clear gradient was observed, with comprehension improving progressively as educational attainment increased. In the multivariable model, illiterate participants had more than five times higher odds of poor prescription understanding compared with graduates (AOR=5.2; 95% CI: 2.1–12.8). This finding highlights the critical role of literacy in enabling patients to interpret written instructions, recognize medication names, and understand dosing schedules. Beyond formal education, health literacy influences an individual's ability to obtain, process, and apply health-related information, thereby affecting medication-related decision-making and adherence.^{3,8,10} The observed educational gradient suggests that conventional text-based prescriptions may not adequately meet the needs of patients with limited literacy skills.

Older age was independently associated with poor prescription understanding (AOR=2.3; 95% CI: 1.2–4.5). Elderly patients often face challenges related to declining memory, reduced cognitive processing speed, visual impairment, and the need to manage multiple medications simultaneously. These factors can impair retention and interpretation of medication instructions, increasing the likelihood of misunderstanding and medication-related errors. Given the growing burden of chronic diseases among older adults, targeted communication strategies and simplified medication instructions may be particularly beneficial for this vulnerable group.¹¹⁻¹⁵

Polypharmacy was another significant predictor of poor understanding, with participants receiving three or more medications demonstrating more than twice the odds of poor comprehension (AOR=2.6; 95% CI: 1.5–4.4). As the number of prescribed medicines increases, so does the complexity of treatment regimens, including variations in dosage, timing, duration, and special instructions. The cognitive burden associated with managing multiple medications may overwhelm patients, particularly those with limited literacy or inadequate counselling. Previous evidence has similarly shown that increasing regimen complexity adversely affects medication understanding and self-management.¹¹⁻¹⁵

One of the most important modifiable factors identified in the present study was the absence of prescription counselling. Participants who did not receive counselling had more than three times higher

odds of poor understanding compared with those who were counselled (AOR=3.4; 95% CI: 2.0–5.8). This finding underscores the central role of effective communication in promoting safe medication use. Counselling provides an opportunity to reinforce key instructions, clarify doubts, and verify patient understanding. Recent evidence suggests that structured communication approaches, including teach-back methods and pharmacist-led counselling, can substantially improve medication comprehension, particularly among individuals with limited health literacy.¹³⁻¹⁶ Strengthening counselling practices at the point of prescribing and dispensing may therefore represent one of the most feasible and impactful interventions in rural healthcare settings.

Rural residence remained independently associated with poor prescription understanding (AOR=1.7; 95% CI: 1.0–3.0). Rural populations frequently experience barriers such as lower educational attainment, reduced health literacy, linguistic diversity, and limited access to health information. These factors may collectively contribute to poorer comprehension of prescription instructions. The finding highlights the need for context-specific communication strategies tailored to the needs of rural communities, including the use of local languages, visual aids, and simplified medication instructions.

Taken together, the findings suggest that prescription misunderstanding is not solely a patient-level issue but reflects broader challenges in healthcare communication. The strong influence of literacy, age, counselling practices, and regimen complexity indicates that improving prescription comprehension requires a multifaceted approach.¹⁻¹³ Interventions such as structured counselling, pictorial medication aids, teach-back techniques, and simplification of complex medication regimens may substantially enhance patient understanding and promote safer medication use in rural primary care settings.¹⁴⁻¹⁶

Conclusion

Prescription understanding among patients attending a rural CHC was suboptimal, with only a minority demonstrating good comprehension. Illiteracy, older age, rural residence, polypharmacy, and absence of prescription counselling were independently associated with poor prescription understanding, highlighting the need for literacy-sensitive communication and structured counselling at the point of care. Targeted interventions for elderly, low-literacy, and polypharmacy patients may help improve safe medication use in similar rural settings.

Strengths and Limitations

Strengths of this study include the use of systematic random sampling, an adequate sample size, and a pretested questionnaire to assess multiple domains of prescription understanding. However, the cross-sectional design limits causal inference, and the findings may not be generalizable beyond similar rural settings. Prescription understanding was assessed immediately after consultation and may not reflect long-term retention. Additionally, medication adherence and clinical outcomes were not evaluated.

Recommendations

Structured prescription counselling should be strengthened at rural health facilities, particularly for elderly, low-literacy, and polypharmacy patients. The use of pictorial aids, local-language instructions, and teach-back techniques may improve prescription comprehension. Regular training of healthcare providers in effective medication counselling is also recommended. Future studies should evaluate the impact of these interventions on medication adherence and clinical outcomes.

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Conflict of Interest

None declared.

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