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Original Research Article

Patterns and determinants of self-medication for oral health problems among hospital outpatients in Jharkhand, India

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ABSTRACT

Background: Unsupervised self-medication for dental ailments presents substantial clinical hazards, yet regional evidence from hospital settings in eastern India remains limited. This study evaluated the prevalence, patterns, and socio-demographic determinants of self-medication for oral health problems among hospital outpatients in Jamshedpur, Jharkhand.
Methods: This cross-sectional analytical study enrolled 400 adult outpatients aged 18 years and above at a tertiary dental facility in Jharkhand using census sampling over 12 months. Data regarding self-medication practices, reasons, drug classes, and information sources were collected using an interviewer-administered questionnaire and evaluated using descriptive statistics and Pearson's chi-square test.
Results: Overall, 248 of 400 participants (62.00%) reported self-medication in the preceding year. Prevalence was significantly higher among participants aged 41–60 years (96/136, 70.59%) than those aged 21–40 years (152/264, 57.58%) and in males (144/216, 66.67%) versus females (104/184, 56.52%). Toothache was the chief complaint (168/248, 67.74%), lack of time was the primary reason (176/248, 70.97%), analgesics were the most common drug class (176/248, 70.97%), and pharmacists were the main information source (136/248, 54.84%); adverse effects occurred in 16 participants (6.45%).
Conclusions: Oral self-medication is highly prevalent among hospital outpatients in Jharkhand, driven largely by acute toothache and time constraints, with older age and male gender significantly increasing likelihood. Public health initiatives and regulatory oversight of pharmacy drug dispensing are urgently needed to reduce inappropriate self-care.

Keywords: Self-medication, Oral health, Outpatients, Toothache, Analgesics

INTRODUCTION

Self-medication-the use of medicines without professional consultation-is a major global public health challenge.[1,2] Painful oral conditions like toothache, abscesses, facial swelling, and gum bleeding cause severe physical distress, leading individuals to consume over-the-counter analgesics, antibiotics, and home remedies prior to dental visits.[2,3] Unsupervised drug use carries substantial clinical risks, including masked diagnostic features, severe drug toxicity, and the accelerated emergence of antimicrobial resistance.[1,3] Epidemiological studies report oral self-medication prevalence rates between 45% and 80% across developing nations.[2,4,5] Self-care typically involves non-prescription painkillers and antibiotics procured directly from community pharmacists.[3,6] However, demographic determinants remain controversial: while some literature shows female predominance due to lower pain thresholds other studies report male predominance or no gender association.[4,6-8] Educational status also shows conflicting effects across regions.[9,10] Health-seeking behavior depends heavily on

regional socio-economic conditions and healthcare accessibility.[8] Existing Indian literature has centered on urban dental centers in southern and western states.[4,5,11] Consequently, empirical data regarding self-medication patterns, triggers, and adverse events among hospital outpatients in eastern, socio-economically distinct, and tribal-adjacent regions like Jharkhand remain lacking.

Therefore, the present study aimed to evaluate the prevalence, patterns, and determinants of oral self-medication over a 12-month period among patients attending a tertiary dental outpatient facility in Jamshedpur, Jharkhand. Authors hypothesized that self-medication behavior is significantly associated with age and gender. Our investigation specifically aimed to assess subgroup prevalence, identify triggering dental complaints and underlying reasons, examine drug categories and information sources, and record self-reported adverse effects.

METHODS

Study design and setting

The present investigation was designed as a hospital-based, cross-sectional analytical study conducted in accordance with the strengthening the reporting of observational studies in epidemiology (STROBE) statement guidelines for observational research.[12] The study was executed in the Dental Outpatient Department (OPD) of M.G.M. Medical College & Hospital, Jamshedpur, Jharkhand, India. Data collection spanned a 12-month operational timeframe from 1 January 2024, to 31 December 2024.

Ethical approval and consent

The study protocol, survey instrument, and informed consent procedures were formally reviewed and approved by the Institutional Ethics Committee (IEC) of M.G.M. Medical College & Hospital, Jamshedpur, Jharkhand (Approval Memo No.: 37/23, dated August 23, 2023). All research procedures strictly adhered to the ethical principles outlined in the Declaration of Helsinki for medical research involving human subjects.[13] Prior to enrolment, written informed consent was obtained from all individual participants after providing a comprehensive explanation of the study objectives, voluntary nature of participation, and right to withdraw without compromising clinical care. Complete participant anonymity and data confidentiality were maintained throughout data management.

Participant selection criteria

Participants were selected from the patient pool reporting to the dental outpatient clinic during the study period based on the following pre-defined eligibility criteria.

Inclusion criteria

Adult patients aged 18 years and above attending the dental OPD during the operational timeframe. Ability to comprehend the survey items and provision of signed/written informed consent.

Exclusion criteria

Patients with severe cognitive impairment, legal incompetence, or neuro-psychiatric conditions precluding sound mental capacity to provide informed consent or objective responses. Patients refusing voluntary participation or returning incomplete survey questionnaires.

Sample size and power calculation

The target sample size (n) was estimated using Cochran's formula for a single population proportion in cross-sectional surveys: $n=(Z^2\times p\times(1-p))/d^2$ where Z=1.96 corresponds to a 95% confidence interval (alpha=0.05), d=0.05 represents the acceptable margin of error (5% precision), and p=0.50 (50%) was assumed as the anticipated prevalence of self-medication to achieve the maximum sample size variance.[14] The calculation yielded a minimum required sample size of n=384 participants. To account for potential non-response, incomplete data entry, or administrative dropouts, the sample size was increased to n=400 participants. Participant recruitment was accomplished using a census sampling method, sequentially enrolling all eligible patients attending the dental OPD throughout the 1-year study duration. Data collection was conducted using a pre-tested, structured, interviewer-administered questionnaire administered by calibrated investigators in the patient's preferred language (Hindi or English). The survey tool was developed and adapted from validated self-medication research frameworks.[15,16] The questionnaire was organized into four structured domains:

Socio-demographic characteristics

Assessment of age, gender, educational level, occupational status, and monthly income, categorized according to Kuppuswamy's socio-economic status scale.[17]

Self-medication practice and triggers

Determination of non-prescribed drug use within the preceding 12 months, frequency, duration of administration, and specific triggering dental complaints (e.g., toothache, oro-facial swelling, gum bleeding, tooth mobility, oral ulceration).

Pharmacological profile and information sources

Classification of consumed drugs (analgesics/NSAIDs, systemic broad-spectrum antibiotics, AYUSH/herbal

remedies, home preparations) and primary sources of recommendation (retail pharmacists, previous dental prescriptions, family members/friends, personal knowledge, internet/social media).

Underlying reasons and adverse events

Documentation of specific motivators for self-care (lack of time, financial constraints, previous successful self-treatment, fear of dental procedures) and self-reported adverse drug reactions or clinical complications.

Statistical analysis

Data were compiled, coded, and entered into Microsoft Excel before being imported into IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp., Armonk, NY, USA) for analytical processing. Descriptive statistics were computed, presenting categorical data as absolute frequencies (n) and percentages (%). Inferential statistics were performed to evaluate bivariate relationships using Pearson's Chi-square (chi-square) test. Statistical significance for all two-tailed tests was established at $p<0.05$.

RESULTS

Table 1 shows demographic details of study subjects. A total of 248 participants (62.00%) reported engaging in self-medication, while 152 (38.00%) did not (Table 2).

Table 3 presents the age-wise prevalence of self-medication for oral health problems in the last one year among study subjects (n=400). In the 21-40 years age group, 152 participants (57.58%) reported self-medication, while 112 (42.42%) did not. In the 41-60 years age group, 96 participants (70.59%) engaged in self-medication, compared to 40 (29.41%) who did not. The chi-square test indicated a statistically significant association between age group and self-medication behavior ($\chi^2=6.451$, df=1, $p<0.05$). Table 4 shows the gender-wise prevalence of self-medication for oral health problems in the last one year among study subjects (n=400). Among males, 144 participants (66.67%) reported self-medication, while 72 (33.33%) did not. In females, 104 participants (56.52%) engaged in self-medication, compared to 80 (43.48%) who did not. The chi-square test revealed a statistically significant association between gender and self-medication behavior ($\chi^2=4.340$, df=1, $p<0.05$). However, no significant difference was observed between Socio Economic Status (SES) classes and practice of self-medication for oral health problems ($\chi2=0.806$, df=3, $p>0.05$).

Toothache was the most common reason for self-medication, reported by 168 participants (67.74%), followed by oro-facial swelling in 40 (16.13%), tooth mobility in 32 (12.90%), and gum bleeding in 24 (9.68%). None of the subjects reported self-medicating for bad breath (Table 5). The most frequently cited reason for self-medication was lack of time, reported by 176 participants (70.97%), followed by previous experience of similar illness in 64 (25.81%), and lack of money in 16 (6.45%). None of the subjects reported unavailability of a dentist as a reason for self-medication (Table 6). Analgesics were the most commonly used medications, reported by 176 participants (70.97%), followed by antibiotics in 80 (32.26%), and AYUSH medications in 8 (3.23%) (Table 7).

The most common source of information used for self-medication for oral health problems was the pharmacist, cited by 136 participants (54.84%), followed by personal information in 64 (25.81%), relatives/friends in 48 (19.35%), and the internet in 16 (6.45%). None of the subjects reported television as a source of information for self-medication (Table 8).

A total of 16 participants (6.45%) reported experiencing adverse effects due to self-medication for oral health problems in the last one year, while 232 (93.55%) did not (Table 9). All 16 participants (100.00%) reported vomiting, acidity, and hot flushes as adverse effects. Diarrhoea was reported by 8 participants (50.00%), while none reported constipation, headache, breathlessness, or fainting (Table 10).

Table 1: Demographic characteristics of study subjects (n=400).

Demographic characteristics	Value N (%)
Age (in years)	
21-40	264 (66.00)
41-60	136 (34.00)
Gender	
Male	216 (54.00)
Female	184 (46.00)
Socioeconomic class	
Upper	00 (0.00)
Upper middle	49 (12.25)
Lower middle	106 (26.50)
Upper lower	102 (25.50)
Lower	143 (35.75)

Table 2: Prevalence of self-medication for oral health problems in last one year among study subjects (n=400).

Self-medication	N (%)
Yes	248 (62.00)
No	152 (38.00)
Total	400 (100.00)

Table 3: Age wise prevalence of self-medication for oral health problems in last one year among study subjects (n=400).

Age groups (in years)	Self-medication		Total, N (%)
	Yes, N (%)	No, N (%)	
21-40	152 (57.58)	112 (42.42)	264 (100.00)
41-60	96 (70.59)	40 (29.41)	136 (100.00)
Total	248 (62.00)	152 (38.00)	400 (100.00)
Chi-square test	χ^2=6.451, df=1, p=0.011 (<0.05), Significant		

Table 4: Gender wise prevalence of self-medication for oral health problems in last one year among study subjects (n=400).

Gender	Self-medication		Total, N (%)
	Yes, N (%)	No, N (%)	
Male	144 (66.67)	72 (33.33)	216 (100.00)
Female	104 (56.52)	80 (43.48)	184 (100.00)
Total	248 (62.00)	152 (38.00)	400 (100.00)
Chi-square test	χ^2=4.340, df=1, p=0.037 (<0.05), Significant		

Table 5: Oral health problems for which study subjects practiced self-medications in last one year (n=248).

Oral health problems*	Self-medication		Total, N (%)
	Yes, N (%)	No, N (%)	
Toothache	168 (67.74)	80 (32.26)	248 (100.00)
Gum bleeding	24 (9.68)	224 (90.32)	248 (100.00)
Bad breath	00 (0.00)	248 (100.00)	248 (100.00)
Oro facial swelling	40 (16.13)	208 (83.87)	248 (100.00)
Tooth mobility	32 (12.90)	216 (87.10)	248 (100.00)

*Study subjects were allowed to mention one or more oral health problem(s), if any.

Table 6: Reasons for self-medications for oral health problems in last one year among study subjects (n=248).

Reasons*	Self-medication		Total, N (%)
	Yes, N (%)	No, N (%)	
Lack of time	176 (70.97)	72 (29.03)	248 (100.00)
Lack of money	16 (6.45)	232 (93.55)	248 (100.00)
Previous experience of similar illness	64 (25.81)	184 (74.19)	248 (100.00)
Unavailability of dentist	00 (0.00)	248 (100.00)	248 (100.00)

*Study subjects were allowed to mention one or more reason(s) for self-medications, if any.

Table 7: Type of drug used for self-medications for oral health problems in last one year among study subjects (n=248).

Type of drug used*	Self-medication		Total, N (%)
	Yes, N (%)	No, N (%)	
Analgesics	176 (70.97)	72 (29.03)	248 (100.00)
Antibiotics	80 (32.26)	168 (67.74)	248 (100.00)
AYUSH medication	08 (3.23)	240 (96.77)	248 (100.00)

*Study subjects were allowed to mention one or more type of drug(s) used for self-medications, if any.

Table 8: Source of information for self-medications for oral health problems in last one year among study subjects (n=248).

Source of information*	Self-medication		Total, N (%)
	Yes, N (%)	No, N (%)	
Personal information	64 (25.81)	184 (74.19)	248 (100.00)
Relatives/ Friends	48 (19.35)	200 (80.65)	248 (100.00)
Internet	16 (6.45)	232 (93.55)	248 (100.00)
Television	00 (0.00)	248 (100.00)	248 (100.00)
Pharmacist	136 (54.84)	112 (45.16)	248 (100.00)

*Study subjects were allowed to mention one or more source of information for self-medications, if any.

Table 9: Adverse effect due to self-medication for oral health problems in last one year among study subjects (n=248).

Adverse effect	N (%)
Yes	16 (6.45)
No	232 (93.55)
Total	248 (100.00)

Table 10: Type of adverse effect due to self-medications for oral health problems in last one year among study subjects (n=16).

Type of adverse effect*	N (%)
Vomiting	16 (100.00)
Acidity	16 (100.00)
Hot flushes	16 (100.00)
Diarrhoea	08 (50.00)
Constipation	00 (0.00)
Headache	00 (0.00)
Breathlessness	00 (0.00)
Fainting	00 (0.00)

*Study subjects were allowed to mention one or more adverse effect due to self-medications, if any.

DISCUSSION

The primary objective of the present investigation was to evaluate the prevalence, patterns, and socio-demographic determinants of self-medication for oral health problems among hospital outpatients in Jharkhand, India. In the cohort, a high overall prevalence of self-medication was observed, with 62.00% of participants admitting to unsupervised drug consumption for dental complaints within the preceding 12 months. Bivariate analysis revealed a statistically significant gender-wise disparity, wherein male participants demonstrated a higher propensity for self-care compared to females (66.67% vs. 56.52%).

Acute toothache emerged as the overwhelming primary clinical indication prompting self-prescription, reported by over two-thirds of self-medicating individuals, followed by oro-facial swelling and tooth mobility. NSAIDs and systemic broad-spectrum antibiotics constituted the predominant pharmacological categories utilized. Furthermore, community retail pharmacists served as the primary source of drug recommendation and procurement, while time constraints and previous symptomatic relief were identified as the chief underlying motivators. Self-reported adverse drug events-primarily gastrointestinal distress and vasomotor flushes-were documented in 6.45% of self-medicating subjects. The overall self-medication prevalence of 62.00% observed in our cohort aligns closely with national and international epidemiological benchmarks reported across developing economies.

A recent global systematic review and meta-analysis estimated the pooled prevalence of oral self-medication at 59.00% among general and dental hospital populations.[2] Regional investigations in South Asia have reported remarkably similar rates, including 62.60% in Nepal, 56.20% in Varanasi, Uttar Pradesh, 63.25% in Riyadh, Saudi Arabia, and 65.30% in Mangalore, Karnataka.[6,8,10,11] Higher rates have been observed in metropolitan centers such as Udaipur (70.00%) and Mumbai (81.00%).[4,5] The consistency across these studies confirms that unsupervised self-care is a ubiquitous response to oral disease in low- and middle-income settings. Regarding gender-wise determinants, the male

predominance observed in the current study (66.67% vs. 56.52%, p=0.037) corroborates findings from several regional Indian surveys. Higher rates of self-medication among males have been documented in Madurai, Varanasi and Udaipur.[4,8,9] Conversely, these findings contrast with studies from Saudi Arabia, Pakistan and a global meta-analysis, which identified female gender as a major predictor.[2,6,7,18]

Methodologically, these discrepancies may stem from regional variation in socio-demographic structures, baseline occupational demands, financial autonomy, and healthcare-seeking behaviors. In industrial and tier-2 urban hubs like Jamshedpur, male daily-wage earners and factory workers frequently experience severe time constraints during standard hospital outpatient hours, compelling them to seek quick OTC pharmacological relief from local pharmacies rather than attending hospital clinics.

The clinical triggers and pharmacological patterns identified in our cohort closely parallel established literature. Severe odontalgia (toothache) was the primary motivator for self-medication in 67.74% of participants, a finding universally reported across clinical literature.[2,5,8,11] In response to acute pain, analgesics/NSAIDs were the most frequently used drug class (70.97%), followed by systemic antibiotics (32.26%). This distribution mirrors global meta-analytic estimates, where analgesics accounted for approximately 60% and antibiotics 19% of self-prescribed remedies.[2] The widespread use of OTC antibiotics for dental pain in India has been highlighted as a critical public health concern.[3]

Furthermore, our observation that retail pharmacists served as the leading source of information and drug procurement (54.84%) reinforces previous findings that community drug outlets function as informal primary healthcare providers in Indian communities.[5,8,11] The pharmacological choices and resulting adverse event profile observed in the present study can be explained by established pathophysiological and biochemical mechanisms. Acute odontogenic pain typically arises from pulpal inflammation (pulpitis) or periapical infection, where tissue destruction triggers the release of inflammatory mediators including prostaglandins, bradykinin, and histamine.[3] Non-steroidal anti-inflammatory drugs (such as ibuprofen, diclofenac, and paracetamol) suppress cyclooxygenase (COX-1 and COX-2) enzymes, thereby inhibiting prostaglandin synthesis and providing rapid, high-potency analgesia.[1] However, non-selective COX-1 inhibition reduces gastroprotective prostaglandin (PGE2 and PGI2) synthesis in the gastric mucosa, leading to increased gastric acid secretion and mucosal ulceration.[1] This mechanism explains why all participants who experienced adverse events in the study reported upper gastrointestinal symptoms, specifically acidity, vomiting, and hot flushes.

Furthermore, the unsupervised consumption of broad-spectrum oral antibiotics (e.g., amoxicillin or metronidazole) disrupts the normal gut microbiome, leading to osmotic and secretory diarrhea, which was reported by half of the symptomatic subjects in our cohort.[1,3] The clinical implications of these findings are substantial for dental practitioners, public health managers, and regulatory authorities. From a diagnostic standpoint, self-medication with analgesics and antibiotics alters or masks classic clinical presentation-converting acute, localized dental pain into low-grade, chronic, or poorly localized distress.[3,5] This symptomatic suppression frequently delays definitive operative intervention (such as endodontic therapy or surgical extraction), allowing underlying pulpal necrosis or periodontal breakdown to progress silently into deep fascial space infections or osteomyelitis.[1,5]

From a health policy perspective, the high reliance on retail pharmacists (54.84%) and the widespread consumption of non-prescribed antibiotics (32.26%) highlight systemic gaps in enforcing Schedule H drug regulations in India.[3] To curb inappropriate self-medication, targeted educational programs should be implemented to raise public awareness regarding the risks of unsupervised drug use. Additionally, continuing education for community pharmacists should emphasize referral pathways for dental complaints rather than empirical OTC drug dispensing.[8,11]

Strengths and limitations

The present study possesses several key methodological strengths. First, it fills a critical gap in the literature by providing localized empirical data on oral self-medication patterns among hospital outpatients in Jharkhand-a region previously underrepresented in Indian dental public health literature. Second, the execution of a 12-month cross-sectional design utilizing a census sampling approach ensured a representative sample size (n=400) that captured seasonal variations in hospital attendance. Third, data were gathered through calibrated, interviewer-administered questionnaires using standardized socio-demographic metrics (Kuppuswamy's scale) and pre-validated survey structures, minimizing structural missing data.

Conversely, certain potential limitations must be acknowledged. First, the single-center design conducted at a tertiary dental hospital in Jamshedpur may limit the generalizability of the findings to rural primary health centers or private dental practices across eastern India. Second, reliance on a 12-month self-reported recall period introduces the possibility of memory decay or recall bias regarding specific drug names and frequency of administration. Third, the cross-sectional nature of the study precludes establishing direct causal relationships between socio-demographic variables and self-medication behaviors. Fourth, social desirability bias may have led some participants to underreport antibiotic misuse or non-prescription drug procurement. These limitations were mitigated by ensuring strict participant anonymity,

utilizing neutral survey phrasing, and conducting face-to-face interviews in the participants' native languages.

CONCLUSION

Self-medication for oral health problems is highly prevalent (62.00%) among hospital outpatients in Jharkhand, driven primarily by acute toothache, time constraints, and advice from retail pharmacists. Male gender was significantly associated with higher self-medication practice. While analgesics provided temporary symptomatic relief, the unsupervised use of antibiotics and the occurrence of adverse gastrointestinal events highlight significant clinical risks. Subsequent research should focus on prospective, multi-center epidemiological studies across diverse urban and rural healthcare facilities in eastern India. Furthermore, interventional trials evaluating the impact of community pharmacy educational initiatives and media-driven oral health campaigns are warranted to promote rational medicine use and timely dental consultations.

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