

Over-the-Counter Medication Use without Prescription Trends in Dhaka City: A Cross-Sectional Survey

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Abstract

Introduction: Self-medication with over-the-counter (OTC) drugs is rising in urban Bangladesh, raising concerns over misdiagnosis, side effects, and antibiotic resistance. Data on such practices among diverse adult populations in Dhaka City remain limited. **Objectives:** To estimate the prevalence of OTC medication, use without prescription, identify motivations, characterize ailments and drug categories, and examine demographic predictors. **Methods:** A cross-sectional survey was conducted from March to May 2025 among 400 adults in Dhaka using multistage cluster sampling. A semi-structured questionnaire captured demographic data, self-medication practices, types of ailments, drug classes, sources, motivations, and knowledge. Data were analyzed using descriptive statistics, chi-square tests, and logistic regression. **Results:** Of 400 participants (mean age 26.5 ± 8.3 years; 52% female), 83.0% reported self-medication in the past three months. Major reasons included quick relief (40.0%), lack of time (27.5%), minor illness perception (21.3%), and high consultation cost (16.8%). Common ailments were fever/headache (24.8%), gastric issues (22.3%), and respiratory symptoms (14.0%). Frequently used OTC drugs included NSAIDs (33.0%), antacids (20.5%), antibiotics (17.5%), and antipyretics (13.0%). Pharmacies were the main source (78.3%), with influences from peers (45.1%) and old prescriptions (42.2%). Male gender, higher education, and student status were significant predictors ($p < 0.05$). **Conclusions:** OTC self-medication is highly prevalent in Dhaka, driven by convenience and accessibility. Misuse of NSAIDs and antibiotics signals urgent need for regulatory control, public education, and affordable healthcare options.

Keywords: Self-medication, Over the counter, Antibiotics, Dhaka, Bangladesh, Public health.

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Introduction:

Self-medication, defined as the use of drugs to treat self-diagnosed disorders or symptoms without consulting a physician, is a global phenomenon with profound public health implications^{1,2}. The World Health Organization (WHO) acknowledges that responsible self-medication can be a positive component of self-care, empowering individuals to manage minor ailments promptly and efficiently³. This practice can offer significant benefits, including increased access to medicines, greater independence for patients in managing their health, and a reduction in the burden on overstretched healthcare systems by saving scarce medical resources for more serious conditions^{1,2}. However, this convenience is shadowed by considerable risks, especially when practiced irrationally or without adequate knowledge. Potential dangers include misdiagnosis, incorrect dosage, prolonged duration of use, adverse drug reactions, dangerous drug-drug interactions, the masking of severe underlying diseases, and, critically, the exacerbation of antimicrobial resistance (AMR) due to the misuse of antibiotics^{1,2,4}.

To mitigate these risks, modern health systems globally rely on a fundamental regulatory distinction between two classes of medicines: over-the-counter (OTC) drugs and prescription-only medicines (POMs)^{5,6}. OTC medicines are those that regulatory bodies have deemed safe and effective for consumers to use for self-diagnosed conditions without the direct supervision of a healthcare professional^{5,7}. In contrast, POMs, or legend drugs, can only be dispensed with a valid prescription from a licensed practitioner. This restriction is applied to medications that may be habit-forming, potentially harmful if used without oversight, or require a professional medical diagnosis to be used appropriately⁷. This two-tiered system serves as a critical public safety framework, designed to balance accessibility for minor conditions with necessary control over potent therapeutic agents.

The context of pharmaceutical regulation and access in Bangladesh presents a compelling paradox. On one hand, the country's landmark National Drug Policy (NDP) of 1982 is celebrated as a major public health success. By prioritizing local production of essential medicines and eliminating thousands of harmful or irrational products, the policy successfully cultivated a thriving, self-reliant domestic pharmaceutical industry, making drugs widely available and affordable for its population^{8,9}. On the other hand, this remarkable achievement in manufacturing and supply has not been matched by commensurate strength in retail-level regulation and enforcement. Consequently, a significant gap exists between policy on paper and practice on the ground. While national policies explicitly prohibit the sale of POMs like antibiotics without a prescription, the practice is widespread and deeply entrenched in communities across the country^{10,11}.

This dissonance is particularly acute in Dhaka, the nation's

capital. As a rapidly expanding megacity, Dhaka is characterized by high population density, significant socio-economic stratification, and a formal healthcare system that is often strained and difficult for many residents to access³. These urban dynamics create a fertile environment for self-medication, where community pharmacies and informal drug shops often serve as the primary, and sometimes only, point of healthcare contact. Previous studies conducted in urban settings in Bangladesh have documented alarmingly high rates of self-medication, with prevalence reported to range from 16% to as high as 81% depending on the specific population surveyed^{3,12,13}. These figures underscore the scale of the issue and highlight the urgent need for a focused investigation within the country's largest urban center.

The central problem this study addresses is the pervasive and often irrational practice of obtaining and using medications without professional medical consultation in Dhaka City. This behavior carries substantial public health risks that extend from the individual to the global community. For the individual, it can lead to delayed diagnosis of serious illnesses, treatment failures, and adverse health outcomes. For the community and the world, the most ominous consequence is the acceleration of AMR, a global health crisis fueled directly by the inappropriate and widespread use of antibiotics for self-treated conditions^{1,14}. While the high prevalence of self-medication in Bangladesh is acknowledged, there remains a need for a detailed, contemporary cross-sectional analysis that systematically maps the specific trends, determinants, and knowledge-practice gaps among the general adult population in Dhaka.

Therefore, the primary objective of this study is to assess the prevalence, patterns, and associated factors of medication use without a prescription, encompassing both true OTC products and illicitly obtained POMs among adult residents of Dhaka City. This report posits that the trend of non-prescription medication use in Dhaka is not merely a reflection of individual choice but is a complex, systemic issue. It is hypothesized that this practice is driven by a confluence of factors, including the paradoxical outcomes of a national drug policy focused on supply over rational use, critical gaps in regulatory enforcement, significant cost and access barriers within the formal healthcare system, and powerful socio-economic determinants that compel residents to seek expedient care from informal and often unqualified sources.

Methods:**Study Design and Setting**

A cross-sectional survey was conducted in Dhaka City, encompassing both North and South City Corporations, over a three-month period (March–May 2025).

Participants and Sampling Strategy

- Eligibility: Adults aged ≥ 18 years, residents of

Dhaka for at least six months.

- **Exclusions:** Healthcare professionals and individuals unable to provide informed consent.

- **Sample Size Determination:** Using the prevalence estimation formula $n = Z^2 \cdot p(1-p)/d^2$ assuming $p \approx 0.74$ (Bangladesh self-medication prevalence) and desired margin of error $\pm 5\%$, at 95% confidence level, the minimum sample size was calculated as ~ 300 . To enhance precision and allow stratified subgroup analyses, the survey targeted $n = 400$ respondents.

- **Sampling Method:** Multistage cluster sampling across six wards. Within each ward, households were approached systematically every third residence until sample quotas were met. At each household, one eligible participant was systematically invited to participate.

Data Collection Instrument and Procedure

A semi-structured interviewer-administered questionnaire was developed, informed by validated instruments used in Bangladesh. The questionnaire was drafted in English and translated into Bengali, then back-translated to ensure semantic accuracy. It consisted of:

- **Section I:** Socio-demographics (age, sex, education, occupation, monthly income, household characteristics).

- **Section II:** Self-medication and OTC behavior—history of use within the past 3 months, specific ailments treated, medicine classes, motivations, sources, knowledge, and prior experience.

Prior to deployment, the questionnaire was pre-tested on 10 participants from a similar population to refine wording and flow. Data collectors—local research assistants fluent in Bengali—were trained intensively on study aims, ethical procedures, and standardized interviewing techniques.

Data Management and Analysis

Data were double-entered and checked in IBM SPSS version 28. Descriptive statistics (mean \pm SD for continuous variables; frequencies and percentages for categorical data) were generated for key variables.

- **Bivariate analysis:** Chi-square tests assessed associations between self medication and demographic variables (sex, education, occupation). Statistical significance was set at $p \leq 0.05$.

- **Multivariate analysis:** Logistic regression (unadjusted and adjusted odds ratios with 95% confidence intervals) identified independent predictors of self medication. Model validity was evaluated using Hosmer–Lemeshow goodness-of-fit test.

- **Quality Control:** Multicollinearity among independent variables was assessed (variance inflation factors < 2.5 deemed acceptable). Sensitivity analyses excluded incomplete responses.

Results:

A total of 400 participants (aged ≥ 18 years) from various

wards of Dhaka City completed the survey. The sample mean age was 26.5 years (SD ± 8.3 ; range 18–60); 52% were female, and respondents included students (58%), service workers (18%), housewives (12%), and others (12%) (Table-I).

Table I: Demographic Characteristics of Study Participants (n = 400)

Characteristic	Category	n	%
Age group	18–24 years	212	53.0
	25–34 years	132	33.0
	≥ 35 years	56	14.0
Sex	Male	192	48.0
	Female	208	52.0
Education level	\leq High school	98	24.5
	College/Intermediate	172	43.0
	\geq Bachelor's degree	130	32.5
Occupation	Student	232	58.0
	Service holder	72	18.0
	Housewife	48	12.0
	Others	48	12.0

Table II presents the number and percentage of respondents who reported using at least one OTC medication without a prescription within the prior three months. Among the 332 self-medicating participants (83.0%), the most frequently cited reasons were “quick symptom relief” (40.0%), “lack of time for medical consultation” (27.5%), “perceived minor illness” (21.3%), and “high cost of physician consultation” (16.8%). Multiple responses were permitted, so percentages for motivations exceed 100% when summed.

Table II: Prevalence of OTC Medication Use and Motivations (Past 3 Months)

Parameter	n	%
Used any over the counter medicine	332	83.0
Top reasons (multiple responses allowed)		
• Quick symptom relief	160	40.0
• Lack of time for medical consultation	110	27.5
• Perceived minor illness	85	21.3
• High cost of physician consultation	67	16.8

Table III delineates the primary health complaints for which participants self-medicated and the corresponding categories of over the counter (OTC) medicines employed. Among the 332 respondents who used at least one OTC medicine without a prescription in the past three months, the most frequently addressed ailments were fever/headache (24.8%), gastric disturbances (e.g., acidity or upset stomach; 22.3%), general or muscle pain (15.0%), cough/cold/allergy symptoms (14.0%), and diarrhea (7.0%). The predominant medication classes used over the same period were NSAIDs, such as ibuprofen, utilized by 33.0% of users, followed by antacids/H₂-receptor blockers (20.5%), antibiotics (17.5%), antipyretics like paracetamol

(13.0%), and vitamins/antihistamines (11.2%). These findings closely align with previous Dhaka-based surveys reporting NSAIDs use at ~28%, antacids ~21%, and antibiotics ~17% among self-medicating individuals.

Table III: Ailments Treated and Classes of OTC Medicines Used

Ailment/Cause	n	%	Medicine Class	n	%
Fever/headache	99	24.8	NSAIDs (e.g., ibuprofen)	132	33.0
Gastric complaints (acidity, upset)	90	22.3	Antacids/H ₂ blockers	82	20.5
General/muscle pain	60	15.0	Antibiotics (e.g., azithromycin)	70	17.5
Cough/cold/allergy	56	14.0	Antipyretics (e.g., paracetamol)	52	13.0
Diarrhea	28	7.0	Vitamins/antihistamines	44	11.2

Table IV summarizes the principal sources through which participants obtained OTC medicines without a prescription, as well as the influences shaping their self-medication choices. The data show that a majority (78.3%) procured medicines directly from pharmacies or drug shops, highlighting the critical role of informal retail outlets in facilitating access to prescription-only drugs.

Table IV: Sources of Medicines and Influencing Factors

Source/Influence	n	%
Purchased from pharmacy/drug shop	260	78.3
Influenced by old prescriptions	140	42.2
Peer/family advice	150	45.1
Based on previous experience/symptom match	120	36.1

Table V presents the percentage of participants engaging in self-medication (SM) across demographic groups and reports chi-square (χ^2) test results for associations. Male respondents exhibited a significantly higher prevalence of SM compared to females (88.5% vs. 77.9%; $\chi^2 = 7.6$, $p = 0.006$). Educational attainment was also significantly associated, with individuals holding a bachelor's degree or higher reporting greater self-medication than those with a high school education or less (89.2% vs. 72.4%; $\chi^2 = 10.2$, $p = 0.001$). Occupational differences were observed: students were more likely to self-medicate than housewives (85.3% vs. 69.1%; $\chi^2 = 4.9$, $p = 0.027$). All associations reached statistical significance ($p < 0.05$), indicating that gender, education level, and occupation are important determinants of self-medication behaviour findings that align with other Bangladeshi studies reporting higher SM prevalence among males and more educated individuals.

Table V: Associations between Self-Medication and Demographics

Variable	Group	% Practiced SM*	χ^2 (p value)
Sex	Male	88.5	$\chi^2 = 7.6$ ($p = 0.006$)
	Female	77.9	
Education Level	≤ High school	72.4	$\chi^2 = 10.2$ ($p = 0.001$)
	≥ Bachelor's degree	89.2	
Occupation	Students	85.3	$\chi^2 = 4.9$ ($p = 0.027$)
	Housewives	69.1	

*Self medication (SM) = use of any medicine without physician

prescription.

Discussion:

This study reveals an exceptionally high prevalence of self-medication (83.0%) among the adult population in Dhaka City, a figure that sits at the uppermost end of the 16% to 81% range previously reported in urban Bangladesh^{3,12,13}. This finding underscores that obtaining medicine without a prescription is not a fringe activity but a dominant health-seeking behavior in the nation's capital. The primary motivations cited by participants, the need for quick symptom relief, lack of time for consultations, and the high cost of physician visits are consistent with research from other developing countries and within Bangladesh, pointing to significant systemic barriers within the formal healthcare system^{15,16}. These factors compel individuals to seek more immediate and affordable alternatives, positioning community pharmacies as de facto primary care providers.

The pattern of ailments treated, primarily fever, headache, gastric issues, and pain, aligns with common minor health complaints globally. Correspondingly, the heavy reliance on NSAIDs (33.0%) and antacids (20.5%) is an expected outcome. However, the finding that antibiotics are the third most commonly self-prescribed medication class, used by 17.5% of participants, is a major public health concern. This figure confirms that the rampant misuse of antibiotics, a key driver of antimicrobial resistance (AMR), is deeply embedded in the community's self-care practices^{1,14}. This irrational use of critically important medicines represents a direct threat to both individual and global health, stemming from a system where prescription-only drugs are dispensed with alarming ease. Other studies in Bangladesh have reported similarly troubling rates of antibiotic self-medication, ranging from 26.7% to as high as 78% among university students^{14,17}.

The overwhelming majority of participants (78.3%) obtained these medicines directly from pharmacies or drug shops, highlighting a critical disconnect between national policy and on-the-ground enforcement. While Bangladesh's National Drug Policy explicitly prohibits the sale of antibiotics and other prescription drugs without a valid prescription, this study confirms that these regulations are largely ineffective at the retail level¹¹. Furthermore, the significant influence of peer/family advice (45.1%) and old prescriptions (42.2%) on medication choice illustrates that health decisions are often made within informal social networks, bypassing professional medical guidance entirely. This reliance on unqualified sources is a well-documented phenomenon in settings where access to formal healthcare is constrained^{10,15}.

The demographic analysis presented several significant associations. The finding that males self-medicated more than females (88.5% vs. 77.9%) is noteworthy and aligns with some Bangladeshi studies¹⁶. More striking was the positive correlation between higher education and

self-medication. Individuals with a bachelor's degree or higher were significantly more likely to self-medicate than those with less education (89.2% vs. 72.4%). This finding, while contrasting with some local studies that identify illiteracy as a risk factor¹⁵, aligns with international research suggesting that higher education may foster a sense of confidence or perceived knowledge that encourages self-diagnosis and treatment¹⁸. Similarly, the high prevalence among students (85.3%) is consistent with studies that identify them as a high-risk group, possibly due to academic stress and time pressures¹⁴.

This research paints a stark picture of self-medication in Dhaka as a systemic issue rooted in the shortcomings of the formal healthcare system and a failure of regulatory oversight. The practice is not merely a matter of individual choice but a widespread, rationalized response to cost, time, and access barriers. The high rate of non-prescription antibiotic use is particularly alarming and demands immediate action. A multi-pronged strategy is essential, combining stricter enforcement of existing drug laws at the pharmacy level with public health campaigns designed to educate all segments of the population, especially educated males and students, about the profound risks of irrational medication use. Empowering pharmacists to move beyond a vendor role to become integral healthcare providers could also improve the safety of self-care practices^{19,20}. Ultimately, addressing the underlying drivers by improving the accessibility and affordability of professional healthcare is fundamental to curbing this dangerous trend and preserving the efficacy of essential medicines for future generations.

Limitation of Study:

Its cross-sectional design precludes the establishment of causal relationships, and the reliance on self-reported data is subject to recall and social desirability biases. As the survey was conducted only in Dhaka, the findings may not be generalizable to rural populations, where healthcare access and self-medication patterns may differ.

Conclusion:

This study confirms that self-medication is not merely a common practice in Dhaka City but a deeply entrenched, systemic issue, with a prevalence of 83.0%. The findings paint a clear picture of a health-seeking behavior driven not by convenience alone, but by necessity, as residents navigate the significant time and cost barriers of the formal healthcare system. While the treatment of minor ailments like headaches and gastric issues with appropriate over-the-counter drugs is a recognized component of self-care, the irrational use of prescription-only medicines is rampant and poses a grave public health threat.

The most alarming finding is the widespread self-medication with antibiotics, reported by 17.5% of participants. This practice, facilitated by the unrestricted availability of these drugs in community pharmacies, directly fuels the global crisis of antimicrobial resistance. The data reveal a critical paradox: a national drug policy successful in ensuring

medicine availability has failed to enforce regulations at the point of sale, effectively turning pharmacies into the primary and often unqualified source of healthcare for a large segment of the population. The significant association of self-medication with higher education levels and male gender highlights the complexity of the problem, indicating that awareness of risks does not necessarily translate to safer practices.

Therefore, addressing this challenge requires a robust, multi-pronged strategy. First, regulatory bodies must enforce existing laws prohibiting the non-prescription sale of antibiotics and other potent medicines. Second, targeted public health campaigns are essential to educate all demographic groups, particularly educated individuals and students, about the specific dangers of irrational drug use and the societal threat of AMR. Finally, and most importantly, long-term solutions must address the root causes by improving the accessibility and affordability of professional healthcare services. Empowering pharmacists through training and integration into the primary healthcare framework could also transform them from simple vendors into trusted advisors for responsible self-care. Without these concerted efforts, the dangerous trend of self-medication will continue to undermine both individual health and the efficacy of essential medicines for the global community.

Conflict of Interest: None.

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