

# The Extent and Factors Associated with Non-Prescription Medicine Use in Eastern India – A Cross-Sectional Survey

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## ABSTRACT

**Objective:** To assess the extent, pattern and determinants of non-prescription medicine use in an urban area of eastern India. **Methods:** A descriptive cross-sectional survey with total 392 subjects was carried out for 3 months by a structured questionnaire to assess the extent, pattern and determinants of non-prescription medicine use amongst the patients at a community retail medicine shop and a pharmacy running in Public-Private Partnership (PPP) model in a government hospital. **Results:** Our study found that 61.4% of the consumers indulged in the practice of self-medication. The commonest reason for self medication was a prevailing tendency in the community followed by cost-saving and convenience. The most commonly used medicines were antacids (43.4%) followed by analgesics-antipyretics (42.6%). It was found that only 12.5% completed an ongoing course of antibiotics. Consumption of ORS was commoner in diarrhoea than vomiting and only a few (13%) of the patients dissolved the ORS powder as directed. Only 9.7% of the subjects thought non-prescription medicine use is safe. Regarding the various types of medicine preparations used by them from the two types of pharmacy, a significant difference was noted only for eye drops ( $p = 0.003$ ). This result might have been obtained due to prevailing ocular infections in the selected study population and underreporting at the Ophthalmology OPD of the nearest hospital. **Conclusion:** The current

study has documented the extent of, factors associated with, and the pattern of non-prescription medicine use resulting in a surge of self-medication practice in urban area.

**Key words:** Non-prescription medicine use, Self-medication, PPP model, Retail pharmacy, Survey.

**Key message:** Given the increasing emphasis on self-care and empowering the public to manage their health with non-prescription medicines, the findings highlight the need for improved pharmacovigilance of these medicines to maximize benefits with minimal risk. Healthcare providers need to be aware of the potential for misuse, abuse and dependence, particularly in patients with long-term illness.

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## INTRODUCTION

Irrational use of medicine along with self-medication poses a great problem amongst the medicine prescribers. Self medication can be defined as obtaining and consuming medicines without the advice of a physician either for diagnosis, prescription or surveillance of treatment.<sup>1</sup> Self-medication is widely practiced worldwide and often considered as a component of self-care.<sup>2</sup> It has both advantage and disadvantages. The World Health Organization (WHO) has appropriately pointed out that responsible self-medication can help prevent and treat diseases that do not require medical consultation. It also provides a cheaper alternative for treating common illnesses.<sup>3</sup> On the contrary non-prescription medicine use in our country might lead to wastage of resources, increased resistance of pathogens, serious health hazards such as adverse medicine reactions and prolonged morbidity. Inadequate access to health care, lack of proper reinforcement of regulatory control and easy availability of medicines without prescription are among many factors responsible for non-prescription medicine use in our country. In the recent last, the US-FDA has restricted 46 new medicines from over the counter. Hence, various studies are being conducted targeting self medication. A recent study from Malaysia has shown that self-medication occurred with an average of 1.3 medicines per participant for GI and metabolic disorders (31.8%) followed by respiratory conditions (19.4%) and musculoskeletal (15.8%).<sup>4</sup> Another study found that self-medication was preferred by 87% of the study participants. The common reasons for self-medication were the ailments being minor (85.2%) or prior experience with the

same condition (49.5%). In 84.4% responders, community pharmacists provided advice for self-medication.<sup>5</sup> A study on the prevalence of self medication practice among the university students of South-western Nigeria has shown that the practice of self-medication was higher among the age group of 25 – 44 years but lower in the 15 - 24 and  $\geq 45$  years age groups, respectively and where females exhibited greater practice of self-medication. Among undergraduate students, self-medication increased as the students' class level in the university increased. Post-graduate students exhibited low prevalence of self-medication practices.<sup>6</sup> Two previous studies were conducted in China on knowledge, attitude and behaviours of university students on the use of antibiotics. The common indications of antibiotic use were common cold, sore throat, and fever. It was seen that during treatment course students switched to other antibiotic, and also changed the dosing strength and frequency. Majority of the students failed to complete the course of antibiotic. In both the studies adverse drug reactions (ADRs) were noted in about 16% of cases.<sup>7,8</sup> A recent study was done in Europe for self-medication awareness for antibiotics. The major sources of procurement of the antibiotics were the community pharmacies and left-over medicines bought previously, easy availability of antibiotics without prescription, pack based dispensing system, and misconception about efficacy for minor illness of these class of medicines were found to be potential formidable factors.<sup>9</sup> In a study conducted in Israel by Vaknin S *et al.*, only 15% of the non prescription medicine users thought that practice of self-medication

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is not safe. The factors are personal experience of purchaser, followed by pharmacist's recommendation,<sup>10</sup> Anraku M *et al* performed a research in Fukuyama among elderly people and children to estimate the extent of use of over-the-counter (OTC) medicines and health food. In children, the most frequently consumed OTC medicines were cold medicines (32.1%), followed by topical creams (22.6%) and eye lotion (14.3%). In elderly people, the most frequently consumed OTC products were eye lotion (18.0%), followed by laxatives (14.8%) and fomentation agents (13.1%).<sup>11</sup> Nielsen MW *et al* had undertaken a study to analyze the association among different types of medicine use and different measures of socio-economic position (SEP) in one and the same general population. It was found that pensioner and self employed use less OTC than salaried employees. Low income consumes less OTC medicines than high income group. Significant difference was not associated with gender and education.<sup>12</sup> Yeufeng L *et al* had shown the pattern of use and factors associated with self-treatment in China. The study reveals that the prevalence of self-treatment with a recall period of two-weeks were significantly higher in urban compared with rural areas.<sup>13</sup> Literature search also revealed that among the medical factors, the most important was medicine safety, followed by efficacy, contraindications, indications, and side effects. Among the business factors, the most important were brand and price.<sup>14</sup> Very few studies have been conducted in India in this regard especially in the Eastern part of India. The study in 2014 in a rural area of north India<sup>15</sup> showed that 50% of patients were seeking self-medication for headache and other types of pain (23.3%), fever (14.5%), UTI (9.7%) and RTI (11.7%). The medicines most commonly purchased for practicing self-medication were NSAIDs (25.3%), medications used for gastrointestinal disorders (20.8%) and antibiotics (16.7%). Prevalence of self-medication was higher primarily among illiterate males aged above 15 years with annual low income.<sup>15</sup> Another research reflected similar sources of information about medicines. 67.3% procured their medicines from medicine shops and the rest from left over medicines. An Indian study was conducted in Hyderabad and Secundrabad on the non-prescription profile of medicine use in rural and urban population. It was found to be higher in the urban areas (37%) as compared to rural areas (17%). Nutritional products, compounds with analgesic, antipyretic and anti-inflammatory effects, and broad spectrum antibiotics constituted a high proportion of non-prescription medicines used in both urban and rural areas.<sup>17</sup>

Therefore, the objectives of this study were to assess the extent, pattern and determinants of non-prescription medicines use in an urban area of eastern India.

## MATERIALS AND METHODS

This questionnaire based descriptive cross-sectional study was conducted amongst consumers from a retail medicine shop in the community and a pharmacy running in PPP model in a government hospital premises in Kolkata between June-July, 2014. Questionnaire development was done by literature search and also inputs from the researchers with expertise in this area. Among the consumers of the medicine outlets, the non-prescription medicine users were included in this study after obtaining written informed consent. The study subjects were male or female aged between 15-75 years and either patient or patient parties or other persons buying medicines from that PPP pharmacy and retail medicine shop. Sampling strategy applied in this study was purposive. Persons who bought medicines regularly for a chronic illness like essential hypertension, hypothyroidism, diabetes, and neurological disorders were excluded from the study. Persons who were unable to read or write in any of the 3 languages viz. English, Bengali and Hindi were also excluded from this study. Institutional Ethics Committee (IEC) permission was obtained prior to the initiation of the data collection.

The non-prescription medicine users were given a validated multiple response type questionnaire with both open and closed ended questions to analyze the pattern of different medicines used by them and the factors associated with such use. The questionnaire was supplied in any of 3 languages viz. English, Bengali and Hindi depending on the acceptability to the subject. We approached 638 medicine consumers in the community that was selected for this study and out of them 392 (61.4%) were found to be non-prescription medicine users, of whom 352 subjects had given informed consent to participate, with a non-responder rate of 10%. Calculation of sample size was done from online survey sample size calculator website, Raosoft ([http://www.raosoft.com/sample\\_size.html](http://www.raosoft.com/sample_size.html)), considering a margin of error of 5%, a 95% confidence level. The population of Kolkata was considered over 14 million (including residents and immigrants).

## Statistical analysis

Data were analyzed using SPSS Version 20 software. Summary statistics were expressed using mean and standard deviation (SD) for numerical variables (median and interquartile ranges when skewed) and counts and percentages for categorical variables. Numerical variables were compared between generic and branded medicine users using Student's *t* test when normally distributed and Mann-Whitney *U* test when skewed. Fisher's exact test was employed for intergroup comparison of categorical variables. Comparisons were two-sided and  $p < 0.05$  was taken to be statistically significant.

## RESULTS

The proportion of non-prescription medicine users in the two study groups i.e. from the retail medicine shop was 66.8% (246 out of 368) and another a pharmacy running in PPP model in a government hospital premises in Kolkata is 54% (146 out of 270). Across the two study groups, it was found that 87.2% of the subjects self-medicated due to different illnesses without prescription and procured medicines without consulting a doctor in the last 4 months. The socio-demographic profile of non-prescription medicine users is shown in Table 1. The percentages of different medicines that were dispensed without prescription in the last 4 months are shown in the Table 2. Table 3 reveals the class of that were dispensed medicines from the community pharmacy and the hospital PPP pharmacy, where a significant difference was noted only for the eye drops ( $p = 0.003$ ). The maximum number of encounters in the last 4 months was 8. Again, 104 out of 392 study subjects selected the antibiotics without prescription for their ailments. The knowledge of antibiotics being limited, recommendation from the dispenser was the most common motivation (28.8%), followed by past experiences (21%), opinion of family members and relatives (20%), previous prescriptions for them/others (17%), opinion from friends (10%). Recommendation by internet users is the least common source of antibiotic users (1%). Figure 1 shows the different indications of non-prescription antibiotics, the most common being fever, sore throat, and diarrhoea. The preferred source of antibiotics were medicine shops followed by left over strips from previous prescription. Majority of them preferred 4 types & 3 types (37.5% & 28.9% respectively) of antibiotics in the form of self-medication for a single episode of illness in last 3 months. The knowledge of the required antibiotic dose for a single episode of illness varied widely as shown in Figure 2. Only 20.4% of total non-prescription medicine users were aware of the fact that same medicines may be sold with different brand names. Figure 3 shows that more than half of the subjects (57.9%) discontinued the intake of antibiotics on subsidence of their symptoms while only few (12.5%) of them stopped the treatment only after completion of the course of antibiotics. Figure 4 shows various types of remedy taken by the study subjects to manage their side effects, of which consulting a pharmacy staff or

**Table 1: Basic socio-demographic characteristics of the non-prescription medicine users (n=392)**

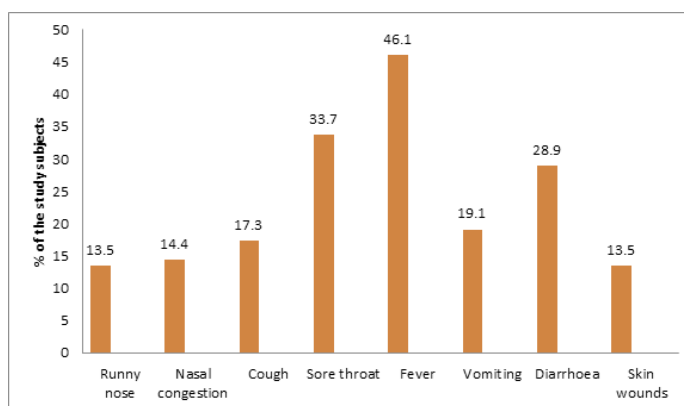
Parameter	Percentage	p-value*
Age (years)		0.6
23-44	26	
>44	74	
Gender		0.6
Male	70.2	
Female	29.8	
Residence		0.7
Urban	55.1	
Semi-urban	41.8	
Rural	3.1	
Education		0.2
Higher secondary	63.8	
Secondary or low	36.2	
Monthly income		0.1
> rupees 19574	56.4	
9788-19574	7.1	
7323-9787	3.6	
4894-7322	15.6	
2936-4893	11.5	
980-2935	5.9	

\*p-value obtained by the application of Chi square test using SPSS Version 20 software.

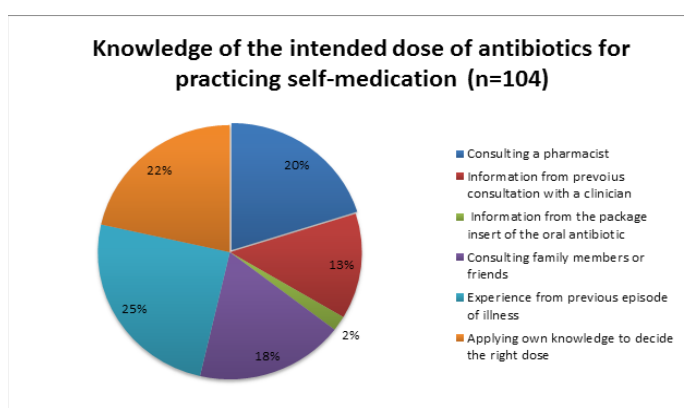
**Table 2: Classes of medicines procured without prescription (n=392)**

Drug groups	Frequency	Percentage
Antibiotics	104	26.5
Analgesics & anti-inflammatory agents	167	42.6
Antiulcer agents	170	43.4
Antiemetics	59	15.1
Laxatives	76	19.34
Anti-diarrhoeals	131	33.4
Antihistamines	13	3.3
Antitussives	59	15.1
Vitamin and nutrients	54	13.8
Sedatives and anxiolytics	1	0.3
Anti-depressants	4	1
Eye drops	19	4.8
Oral contraceptives & “morning after” pills	24	6.1
Inhalers & rotahalers	32	8.2

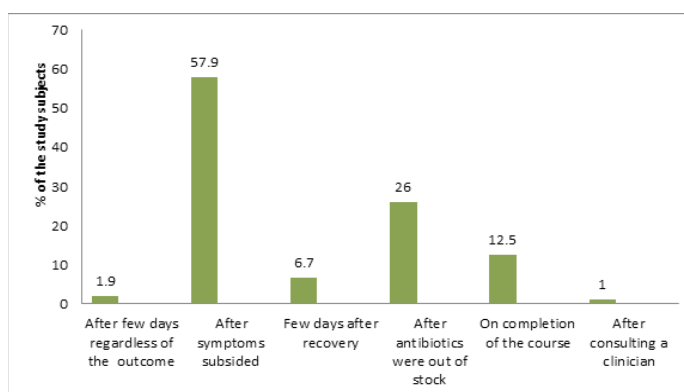
person at the dispensing counter was felt easier than consulting a physician. It was observed that 167 (42.6%) non-prescription medicine users preferred antipyretic-analgesic fixed dose combination (FDC) including paracetamol mainly for fever (93%). Only 19% of them consumed such FDCs for inflammatory conditions. Consumption of ORS was common for diarrhoea as compared to vomiting. Only 13% & 11% of the respondents dissolved the ORS powder in one litre of water in episodes of diarrhoea & vomiting respectively. It was observed that 10 out of 13 (76.9%) anti-allergic medicine users reported of drowsiness. Lastly among the all non prescription medicine users, 64.5% had a firm belief



**Figure 1: Clinical conditions that required the self-medication with antibiotics (n=104).**



**Figure 2: Knowledge of the intended dose of antibiotics for practicing self-medication (n=104).**



**Figure 3: Reasons for discontinuation of the course of antibiotics (n=104).**

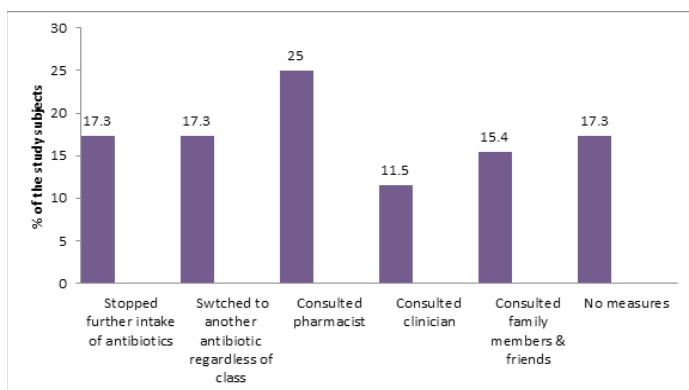
that self-medication is an acceptable practice, 25.8% thought it a good practice and only 9.7% of them agreed that such practice is not acceptable.

## DISCUSSION

Self-medication is widely practiced worldwide and often considered as a component of self-care. We found that across the two study groups, a majority i.e about 87% preferred self-medication practice due to various ailments for themselves, family members, relatives and friends in the last 4 months. This study revealed that not less than 61.4% of the medicine

**Table 3: Consumption pattern of non-prescription medicines from the community and PPP hospital pharmacy counters (n=392)**

Drug groups	No. of consumers from community retail outlet	No. of consumers from the hospital pharmacy	p-value
Antibiotics	70	34	0.5
Analgesics & anti-inflammatory agents	104	63	0.9
Antacids & antiulcer agents	110	60	0.5
Antiemetics	36	23	0.7
Laxatives	51	22	0.1
Anti-diarrhoeals	77	56	0.1
Antihistamines	8	5	1.0
Antitussives	37	22	1.0
Multivitamins	35	19	0.7
Sedatives & anxiolytics	1	0	1.0
Anti-depressants	4	0	0.3
Eye drops	16	3	0.003
Oral contraceptives & "morning after" pills	14	10	0.6
Inhalers & rotahalers	21	11	0.09

**Figure 4:** Remedy opted for the management of side effects due to self-medication with antibiotics (n=104).

consumers indulged in self-medication practice in the community and greater proportion of the beneficiaries depended on the community based retail medicine shop. It was seen that there were various reasons for preferring self-medication practice in the study subjects. More than one third of them (35.7%) preferred self-medication as it was a common practice in their locality and almost similar proportion preferred affordability (33.7%), followed by convenience (30.1%). Only 0.5% consumer had lack of trust to the modern medicine and the physician. This finding is in discordance with another recent survey<sup>5</sup> that revealed common reasons for self-medication as ailments being minor (85.2%) or prior experience with the same problem (49.5%). A study conducted in a rural area of north India<sup>15</sup> has shown self-medication with NSAIDs alone or in FDCs (25.3%), GI medicines (20.8%) and antibiotics (16.7%) while we found self-medication in 43.4% of the study subjects with antacids followed by antipyretic-analgesic including paracetamol (42.6%) alone and in FDCs. Again majority of them preferred (46.1%) antibiotics for fever, followed by 33.7% for sore throat, 14.4% for nasal congestion, 13.5% for runny nose, and 28.9% for diarrhea. This finding corroborates with that of a study from China<sup>8</sup> with self-medication for sore throat (59.7%), fever (38.2%), cough (37.4%), runny nose (29.3%), and nasal

congestion (28.7%). Majority of our study subjects (28.8%) selected the antibiotics on recommendation from dispensing counter, and 21.2% from past experiences and left-over strips. This observation correlates with two recent studies<sup>9-16</sup> where 67.3% subjects procured their medicines from retail medicine shops and the rest from left over medicines. Another study from outside India<sup>7</sup> reported ADRs with self-medication in 16.7% of the respondents, while in our study 13.3% of the subjects reported the ADRs. In the same study 36.5% subjects switched over to another antibiotic but in our study 17.3% of the respondents switched on to another medicine during the course of antibiotics. Our study found that consumption of ORS is more common for diarrhoea than vomiting and very few (13%) of the respondents had knowledge about the directions to dissolve and use the ORS powder. Therefore, the awareness about proper ORS usage is scarce in our study population. A study from Israel<sup>10</sup> revealed that about 15% of the non-prescription medicine users believed that practicing self-medication is not safe whereas only 9.7% of our study subjects believed that self-medication is an unacceptable practice. In our study, individuals who were dependent on non-prescription medicine use informed us that they were never asked by pharmacy staff about their motive of procurement of medicines and this observation is in concordance with a recent survey conducted in UK.<sup>20</sup> A gross over-usage of non-prescription antibiotics, that too not taken for a full course, by most of the patients of URTI was found recently. The study has shown that lack of awareness in the patients could increase the drug resistance problem and awareness about the branded drugs being costlier than the generic drugs was also not there.<sup>21</sup> The first Indian study which provides a comprehensive picture of self-medication practice among future health-care providers (medical and paramedical students) from across the country shows lesser prevalence of self-medication than us.<sup>22</sup> Limitations of this study are that we could not find an influence of the demographic profile of the subjects upon the practice of non-prescription medicine resulting in self-medication practice. The class of medicines procured from the community pharmacy and the hospital PPP pharmacy was statistically significant only for ophthalmic eye drops. This may be due to a higher prevalence and seasonal variation of ocular infections in the community from where we have selected our study group. It could also be due to ignorance of the study subjects to visit the Ophthalmology OPD of the nearest government or private hospital. Stratification of the

study subjects according to their respective clinical specialities has not been possible in this study. Future surveys with larger sample size may be undertaken to overcome the limitations of our study.

## CONCLUSION

This study has documented the extent of non-prescription medicine use, the factors associated with such an irrational practice and the pattern of such consumption of medicines that have resulted in wider and indiscriminate self-medication practice among the study subjects. However, the determinants of such practice were not elicited within the ambit of our findings and analysis. Further studies may be undertaken with greater sample stratifications to generate more interesting findings.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest

## CONTRIBUTIONS OF AUTHORS

MD, SC and RSD planned and conceptualised this study, RKR complied with the proposal and revised further for conducting it, RD along with MD and SC performed the field survey, SC analysed the data, MD and RSD drafted the manuscript and all the authors finalised it for submission.

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