

WITHOUT PRESCRIPTION ANTI BIOTIC DRUGS DISPENSED IN DHAKA CITY

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ABSTRACT

Background: Low income and high out-of-pocket drug costs both play an important role in medication restriction, consistent with basic economic principles. Such situation may lead to patient failing to complete the required treatment regimen or patients performing self-medication without consulting any physician, leading to, in case of antibiotic therapy, antimicrobial resistance. Therefore, it is important to monitor the dispensing of medication in pharmacies and to observe whether drugs are being sold without prescription. **Aim:** To survey the age group of patients, number of antibiotics sold without prescription by the local pharmacies and the cost borne by the patients in case of the antibiotic drugs used in Uttara, Dhaka. **Materials and method:** This cross-sectional survey was carried out between January 2017 to June 2017 in 3 big pharmacies in Uttara. In this study 10 selling time points were randomly selected to note the age groups of patients making antibiotic purchases without prescription at these pharmacies, quantity of antibiotics dispensed and the price paid by these buyers in the selected time points. **Results:** The number of antibiotics bought without prescription from each shop per time point ranged between 5 to 15. According to the age categories, the number range of antibiotics bought by patients in age group of 10-18 years and 19-24 years was 10-15. Those patients in the age groups of 25-32 years and more than 55 years obtained 6 to 15 number of antibiotic drugs. The range of number of antibiotics attained by patients in the age groups of 33-42 years and 43-55 years was 5-15. These values were statistically significant ($p < 0.01$). The average number of antibiotic drug obtained by patients in the 6 age groups ranged between 36 to 59 pieces and the findings were statistically significant ($p < 0.01$) in all age groups. The average expenditure of antibiotic drug for the age groups ranged between Taka 841 (in more than 55 years age group) and Taka 1714 (in 10-18 years age group) and the outcome were statistically significant ($p < 0.01$) in all age groups. Finally statistically significant ($p < 0.01$) association was observed between the age groups of patients with the quantity and costing of the antibiotic bought by each age group. **Conclusion:** The findings of this study suggests that a large portion of the country's population has access to drugs including antibiotics without the need for any prescription. A scenario as such may rapidly lead to antibiotic resistance. This study may help in promoting initiatives to control antibiotic usage without prescription and halt progress to antibiotic resistance.

Keywords: Prescription drug, Patient drug use, Antibiotic drugs

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INTRODUCTION

In Bangladesh, self-prescription of lipid-lowering drugs requires laboratory monitoring of serum lipids and other

biochemical parameters and so invokes another element of self-treatment that the self-prescription of a non-sedating antihistamine does not¹.

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Without advice, 80% of people use paracetamol as pain killer for fever. Physicians should be alert to the possibility of medication restriction among their patients with no insurance and safety, particularly minority patients and those with low income or high out-of-pocket drug costs. One view recognizes self-prescription among residents as a reaction to the intense time pressures residents face and their difficulties receiving medical care. Many of the residents surveyed remarked that their busy and unpredictable schedules made it difficult to arrange care for acute conditions and arrange appointments for disease prevention or management of more chronic conditions². Asking about the impact of medication costs can help physicians identify patients who could benefit from government assistance, industry programs for the medically indigent, or the selection of less-expensive therapeutic alternatives. However, the scope of this problem among vulnerable seniors calls for a broader solution³.

A more comprehensive coverage plan, and policies that limit medication costs, may help reduce medication restriction and with it the clinical, economic, and social morbidity that disproportionately affects our most vulnerable patients⁴. Drug purchases without prescription in Bangladesh are made in quantities which represent less than a single day's dose and rarely is a full course of therapy purchased at one time⁵. A study done in Chattogram, Bangladesh observed self-medication with antibiotic was more common among male participants (60.54%) in comparison to female (51.57%). The rate of self-medication was higher when level of education was below secondary (more than 50%) and individuals belonging to low income group (55.19%). They also reported that the most common antibiotics purchased was azithromycin and most common symptoms for which

self-medication was done was cough and cold⁶. Another study noted 56.3% of respondents self-medicated with antipyretics, 45.5% with antibiotics and 23.4% with anti-ulcerants and antacids, and 17.3% with antidiarrheals⁷.

Availability of over-the-counter medicines have led to misuse of drugs throughout Bangladesh and in other countries of South East Asia. About 4 million misusers of drugs have been estimated to be present in South Asia in which half a million belong to Bangladesh⁸. Self-medication is a common phenomenon globally like in Asia 38.2% Nepalis; 32.5% of Indians and 84.8% of Pakistanis self-medicate. Also in America 70.1%; in Italy 69.2% and in Brazil 16.1% self-medicate⁹⁻¹⁴. In a study done in Cumilla, Bangladesh self-medication was noted among 73.6% of population¹⁵. The most common influencing factors in favor of self-medication in Bangladesh was reported to be drug outlets, previous experience or prescriptions, and consultation of friends and family^{16,17}. Prescription only drugs are being recommended and sold illegally by drug store salesmen as well^{18,19}.

The reasons why people choose self-medication include saving cost, time needed for consultation, and convenience²⁰. However, in a low literacy country like Bangladesh free accessibility of prescription only drugs may hold serious risk of irrational and inappropriate drug use for which they may suffer from drug interactions, over dosage, adverse drug reactions and in case of antimicrobials, antimicrobial resistance^{19,21}.

Low income and high out-of-pocket drug costs both play an important role in medication restriction, consistent with basic economic principles²². A strong association has been noted between medication restriction and minority ethnicity which suggests that ethnic minority patients may be more

predisposed to medication restriction when confronted with prescription costs for which they lack insurance. However, interethnic differences in attitudes and behaviors toward medical decisions, reflecting different experiences with the health care system, may also play a role^{23,24}. The common health conditions for which patients opt for self-medication in Bangladesh are cough and cold, fever, abdominal pain, back pain, acidity, typhoid, typhus, diarrhea, headache, community acquired pneumonia, wounds, amebiasis, allergies and tonsillitis²⁵.

Our study focuses on the number of individuals purchasing drugs including antibiotic without prescription; quantities of antibiotics being purchased without prescription along with the age groups that make such purchases and the cost borne by these individuals. Although antibiotics are lifesaving but overuse may lead to life threatening condition of antibiotic resistance. Previous studies have reported that appropriate knowledge, awareness and positive attitude may have influence on administration of antibiotic^{26,27}. Antibiotic resistance is a rapidly growing concern in this country²⁸. In Bangladesh antibiotic is available widely without prescription²¹. Biswas et al. in 2014 reported 26.69% of the responding individuals self-medicated with antibiotics. They mentioned that factors associated with non-adherence to protocol of antibiotic usage were lack of knowledge, previous experience and advice by others²⁹. Another study was performed in southern Bangladesh by Sutradhar et al. in 2014 to report the irrational antibiotic administration practices and reported that according to the physicians the cause of antibiotic resistance in the country is the patients' non-compliance to adhere to antibiotic regimen. They also reported that almost 50% of patients stop taking antibiotic once the symptoms disappear³⁰.

The study performed by Kabir et al in 2021 found a prevalence of antibiotic use without prescription to be 37.02% among the urban Bangladeshi population and

found that attitude towards antibiotic, knowledge about antimicrobial specifications and knowledge about antibiotics were influencing the usage of antibiotics without prescription²¹. Therefore, keeping in mind that limited number of studies have been performed on the extent of antibiotic usage without prescription in Bangladesh, this study was undertaken to further shed light on the real scenario of antibiotic consumption in absence of prescription from registered physician.

MATERIALS AND METHOD

Study design

Cross sectional study design to perform this study.

Study place and period

The study was carried out in 3 prominent medicine shops in Uttara, Dhaka, Bangladesh from January 2017 to June 2017.

Study Population

The study population consisted of those individuals who purchased drugs including antibiotics without prescription who made their purchases at the 10 selling time points randomly selected to perform the survey in each of the 3 medicine shops.

Selection criteria

This study included subjects who made drugs (including antibiotic) purchase without prescription belonging to 6 age groups (10 to 18 years; 19 to 24 years; 25 to 32 years; 33 to 42 years; 42 to 55 years; > 55 years)

Sampling technique

Purposive sampling was performed in this study.

Data collection

Collection of data was done using a structured survey questionnaire that was used to collect information about the

quantities of antibiotics being purchased; the number of individuals in each age group making drugs (including antibiotic) purchases and the cost borne by the patients while purchasing these drugs as a whole and cost borne by them for buying antibiotics.

Ethical approval

Ethical approval for this study was not required since no form of intervention on human or animal was involved in this study.

Impact of this research work

This survey may help disclose to some extent the scenario of the volume of antibiotic purchases without prescription in the urban Bangladesh. This study also may reveal the age groups making more of these purchases. Policy makers and future researchers may use a survey as such to plan for future actions and researches on wider scale.

Statistical analysis plan

The completed questionnaire data were compiled, appropriately sorted, and analyzed using Statistical Package for

Social Sciences [(SPSS) IBM Corp. Released in 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY; IBM Corp]. Descriptive analysis was performed to compare the age and cost of drugs purchased without prescription. Cross tabulation and regression analysis was carried out. Results were expressed as mean with standard deviation. The study used ANOVA Analysis for analyzing antibiotic purchased with each patient age group. In the analysis we considered $p < 0.05$ as significant.

RESULTS

The study included 6 age groups of individuals who made drugs purchases without prescription in the places of study. Table 1 shows the number of patients in each group who bought drugs without prescription from the pharmacies. The highest number of patients making these purchases belonged to the age group of 42-55 years (8.46 ± 0.73 patients; $p < 0.01$) followed by the age group of 33-42 years (11.73 ± 1.05 ; $p < 0.01$).

Table 1: Average of patient number with each patient age group

Age group of patients (Years)	Mean(SD)	Minimum	Maximum	<i>p</i> -value
10-18	8.46(0.73)	8	10	
19-24	8.90(0.85)	8	10	
25-32	9.57(0.86)	9	13	<0.01
33-42	11.73(1.05)	9	14	
42-55	12.33(1.16)	11	14	
>55	10.36(2.85)	8	18	

SD = Standard Deviation; Highly statistically significant $p < 0.01$

Table 2 shows the cost borne by the patients in each group for purchasing drugs which includes antibiotics. The highest cost borne was found to be by the age group of 10-18 years (Taka 752, $p < 0.01$), followed by those in the age group of 25-32 years (Taka 655) which is statistically significant ($p < 0.01$).

Table 2 : Average buy of drug in each patient age group

Age group of patients (Years)	Mean(SD)	Minimum	Maximum	p-value
10-18	751.91(140.08)	512	867	
19-24	321.45(109.00)	168	439	
25-32	654.64(216.52)	508	1209	
33-42	605.43(180.73)	386	1014	<0.01*
42-55	635.20(137.15)	398	1179	
>55	535.17(545.86)	201	2000	
Total (n=180)	583.97(295.54)	168	2000	

SD= Standard Deviation

The Anova analysis of the purchased antibiotics (quantity and costing) without prescription are displayed according to the age group of patients in Table 3. The average number of antibiotics sold to each age group varies with maximum number of antibiotics being purchased by the age group of more than 55 years ($8.83 \pm 5.418, p < 0.01$) and the most cost for purchasing antibiotics was borne by the age group of 33-42 years ($172.21 \pm 52.763, p < 0.01$).

Table 3: ANOVA Analysis of the antibiotics purchase with each patient age group

Variables	Age group (years)	Mean	SD	Minimum	Maximum	p-value
Anti-biotic quantity	10-18	5.96	2.530	3	10	
	19-24	4.50	1.240	3	6	
	25-32	5.35	3.051	3	15	
	33-42	8.52	4.669	3	14	<0.01
	42-55	6.77	1.663	5	12	
	>55	8.83	5.418	6	20	
	Total	6.66	3.749	3	20	
Anti-biotic price (Taka)	10-18	172.21	52.763	96	234	
	19-24	63.55	29.859	31	112	
	25-32	132.25	58.755	99	326	
	33-42	191.96	103.617	99	332	<0.01
	42-55	135.00	65.326	55	240	
	>55	137.41	98.752	69	320	
	Total	138.73	82.373	31	332	

SD= Standard deviation

DISCUSSION

This study investigated the administration of drugs including antibiotics without prescription among the population residing in an area of the capital city of Bangladesh. It noted that the number of patients buying medication including antibiotics without prescription from a registered physician was the highest in the age group of 42-55 years (12.33 ± 1.16). Significant association was observed between the age groups and the quantity of antibiotics purchased and the cost borne by patients for purchasing them. Similar outcome was noted by Kabir et al. who investigated administration of antibiotics without prescription and factors associated among the urban Bangladeshi population. They also found significant association between age of respondents²¹.

Access to prescription medications increase the potential for self-treatment. Although many warn of the loss of objectivity that can accompany self-prescription, previous studies suggest that self-prescription is common among practicing physicians and medical students^{31,32}. The study showed the number of patients purchasing drugs range between 8 and 18 are self-medicating or are taking the help of the medicine shop keepers to make the drug purchase. Self-medication is an age old practice. Urge of self care, feeling of sympathy towards family members in sickness, lack of health services, poverty, ignorance, misbeliefs, extensive advertisement and availability of drugs in other than drug shops are responsible for growing trend of self-medication^{16, 22}. The study has observed a statistically significant number of patients in each age group are purchasing drugs without prescription and statistically significant quantities of antibiotic are being purchased without prescription by each of the age group. Also noted was that the middle age group (33-42 years) were making the highest quantity of antibiotic purchase and were bearing the most cost

while making these purchase. This may be due to this group having more purchasing power^{33,34}.

As per protocol, administration of antibiotic must take place only with prescription from a registered physician. Antibiotic misuse leads to the emerging of antibiotic resistance, a matter of deep concern²¹. In numerous parts of the globe antimicrobials (once effective) resistance has developed, which is a health-associated crisis worldwide. Antibiotic purchases in the younger age group of less than 20 years in this study was also statistically significant, similar to previous studies^{21,35,36}.

Previous studies have implied that lack of knowledge of the antibiotic specification and inappropriate attitude towards antibiotic usage are some of the factors that promote antibiotic purchasing behavior without prescription³⁷⁻³⁹. The effect of medication restriction and self-medication, in particular, that of antibiotics on the health and welfare of individual patients, and on total health system spending, remains incompletely defined. However, policies designed to limit medication use may have serious consequences for patients' health, resulting in increased emergency department visits, nursing home admissions, use of emergency mental health services, and more⁴⁰. Therefore, considering the financial backdrop of the Bangladeshi population as well as their attitude towards drug including antibiotic purchase, the policy makers and physicians need to develop programs to educate and subsidize in order to encourage drug purchases with prescription before we witness a catastrophe of the results of antimicrobial resistance among our population⁴¹⁻⁴³.

CONCLUSION

Considering our research evidence, we want to explore the pattern of drug usage including antibiotic use among all age groups in Dhaka of Bangladesh with

important factors that are mentioned in relation with medication consumption. Self-defined health condition is essentially a very important determinant of medicine use as no prescription is practically needed to purchase any sorts of medicine in most South Asian countries, including Bangladesh. The self-medication pattern in population level which will give us a picture regarding drug use status and risk of the people of Bangladesh and the factors responsible for it particularly self-perception of health along with symptom based medication available in medicine shops.

LIMITATIONS

The data collection in this study was convenient and spent time to correctly fulfill one data sheet for the information. Our instrument was pilot tested to judge completeness, readability, and accuracy, but, in the end, the validity of these results depends on respondents' comprehension, recall, and honesty. Recall bias would likely result in underreporting the number of self-prescribed medications. Similarly, despite anonymity, residents might be reluctant to report use or prescription of certain classes of medications

CONFLICT OF INTEREST

There is no conflict of interest.

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