**Medicine Brand Acquaintance of Young Adults in Bangladesh.**

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**Abstract**

Background: Previous studies on self medication status in Bangladesh showed appalling self medication behavior among general population of this country. Ciprofloxacin, doxycycline, amoxicillin, metronidazole and other drugs are being self medicated and misused in Bangladesh. Aim: To reveal in-depth insight into self medication behavior among people of Bangladesh and to propose planning and management on public medication use at national level. Methods: This study was carried out in January to June 2009 over 956 nonmedical adult people of two major cities of Bangladesh- Dhaka, the capital city and Pabna. A questionnaire containing a list of 37 carefully chosen and highest selling brand names of generics belonging to four therapeutic categories - anti-infectives, analgesics, H1-antihistamines and antipsychotics/drugs affecting central nervous system was used for the survey. The study population was asked to mark those brands whose names they knew. Snowball sampling technique was used in the survey process. Results: Significantly higher \( p<.05 \) acquaintance with all categories of the medicine brands was associated with male sex, lower educational qualification etc. The brands of generics which showed relatively higher acquaintance were Paracetamol [97%, n=932], Aspirin [83%], Chlorphenamine [76%], Domeperidone [70%], Penicillin [67%], Ciprofloxacin [67%], Cetirizine [59%], Amitriptyline [58%], Doxycycline [57%], Diazepam [54%], Metronidazole [51%], Amoxicillin [51%], Promethazine [49%], Diclofenac [49%], Clonazepam [47%], Prochlorperazine [46%], Promethazine [43%] etc. Conclusions: Drugs having higher misuse rates showed higher acquaintance rates which implies the general population has an active contribution towards misuse incidences, resistance developments and other health hazards. Therefore, the anti-infectives, antipsychotics, some pain relieving agents and many other drugs deserve a prescription only status in this country. Focusing on education of health professionals should not be the only way to tackle the misuse incidences.

**INTRODUCTION**

Previous study findings indicate that ciprofloxacin, doxycycline, amoxicillin, metronidazole and other drugs are being self medicated and misused in Bangladesh. (Chowdhury et al., 2010). Several pain relieving agents and H1-antihistaminics, i.e., diclofenac, desloratadine, promethazine etc., which are not recommended for self medication, showed self medication rates above 50% in this country (Chowdhury et al., 2009). In Bangladesh and its neighboring countries like India and Pakistan, distribution of antimicrobials is not regulated and therefore they are available without prescription. It has been postulated that the emergence of resistance in these countries is a direct reflection of misuse based on over-the-counter availability. But some studies argued that the over-the counter availability of drugs cannot be held responsible for self medication or misuse of antimicrobials and suggested that the education of the medical profession is the single most important tool to control misuse of antimicrobial agents (Islam et al., 1996; Islam et al., 2008; Sturm et al, 1997).

The present study aimed to evaluate how much acquainted a nonmedical Bangladeshi adult educated person is with drugs from across four therapeutic categories, i.e., pain relieving agents, anti-infectives, antipsychotics, H1-antihistamins and compare the acquaintance level with the respective drug’s self medication rate, and hence predict whether the individuals have capability to misuse medicines and contribute to resistance development and other medical adverse effect occurrence. Brand acquaintance has been mentioned as a positive factor in purchasing. All brands included in the present survey are the highest selling brands within the respective therapeutic categories. In this study, identifying a drug by its brand name and being able to state its use to cure particular symptom or disease has been termed as ‘brand acquaintance’.
The objective of this study was to investigate the extent of drug brand acquaintance, including both prescription and non-prescription drugs for educated population of two cities-Dhaka and Pabna, two cities where the major pharmaceutical industries of Bangladesh are situated. A study on medication brand acquaintance among educated and adult people within this country is necessary in order to comprehend the consequence of the availability of FDA (Food and Drug Administration, USA)-defined prescription-only drugs without prescription, to keep healthcare appraised, to advise the authority of healthcare options and to arrange for appropriate level of public healthcare and drug administration.

METHODS
The study was conducted among the adult and educated inhabitants of Dhaka and Pabna city. 956 people were surveyed using snow ball sampling method. Structured questionnaires were supplied to people doing recreation or gossip by visiting the recreation centers, university canteens, fast food shops, shopping malls during January-May 2009. Cases if not interested to participate in the interview were excluded. Hospital staffs, patients, medical students and professionals and people who ever worked for any pharmaceutical company or drug retail shop were excluded from the survey. People underlined the brand names of drugs they could identify. When collecting questionnaires, the interviewers asked them to state the diseases or symptoms for which the brands are commonly used. The interviewers marked the cases where the diseases or symptoms were correctly answered. Only the correctly answered brands were considered for analysis of acquaintance. Frequency distribution and chi square test were used in the survey. Trained faculty students from State University of Bangladesh collected data through conducting direct dialogue/interview with the sampled population.

37 kinds of drugs belonging to four therapeutic categories (anti-infectives, analgesics, H1-antihistaminics and antipsychotics/drugs affecting central nervous system) were studied in this survey. 95% confidence interval and 10% non-response were considered.

The drug brands were selected after careful consultation with product managers and in house data of reputed pharmaceutical companies. When more than two brands of one generic drug were identified by a sample pupil, the acquaintance value considered for analysis was ‘one’. The incidents of acquaintance of all brands marketed by different pharmaceutical companies were summed up under the name of the generic. The higher acquaintance level was defined as 60%. In this survey, the people having age 14 and above were considered ‘adult’ and people having a secondary school graduation record and above were considered ‘educated’. Only adult and educated people were included in this survey.

DATA MANAGEMENT
Supervisors in the field regularly reviewed questionnaires. Field researchers double-checked the completeness of questionnaires at the field immediately after conducting interviews. Supervisors directly observed 5% cases during the interview conducted by field workers. Information from the written questionnaires was entered into an electronic database.

DATA ANALYSIS
The data thus gathered was analyzed using SPSS software version 13.0. The trends in population characteristics across explanatory variable (e.g. medication acquaintance rate) were assessed using Pearson’s chi square test for categorical variables and simple linear regression for continuous variables. The analysis was exploratory.

ETHICS
The Department of Pharmacy, State University of Bangladesh, which has been granted the accreditation of the Pharmacy Council, Bangladesh and University Grants Commission, Bangladesh, reviewed the study before approval and approved accordingly. Sample pupils signed their name on the questionnaire after filling it. The names of the brands from different pharmaceutical companies have not been elucidated. The analysis was done on the basis of generics.

RESULTS
The population size drawn from Dhaka and Pabna was almost equal (456 vs 500). Due to the conservative nature of Bangladeshi society, few women (21.3% of total survey population) were available in the street for interview (Table 1).

12 out of 37 drugs’ brands (Table 2) were recognized by more than 50% of the sample population. The names of generics of those brands are paracetamol, aspirin, chlorphenamine, domperidone, cetirizine, doxycycline, diazepam, ciprofloxacin, amoxicillin, metronidazole. Another 12 drug brands (Table 2) were recognized by 25%
to <50% of the survey population, the names of generics of those brands are: clonazepam, prochlorperazine, diclofenac, promethazine, cefpodoxime, cefradine, cefixime, loratadine, midazolam, valdecoxib, sertraline, cefuroxim. The remaining 13 drug brands, despite having high sales and reputation among medicine community showed extremely poor recognition rate (<25%) among general street population, the names of generics of those brands are: flupenthixol-melitracen, tetracycline, bromazepam, celecoxib, tramadol, azithromycin, desloratadine, flucloxacillin, cotrimoxazole, erythromycin, pizotifen, chlorpromazine, ketorolac. (Table 2)

From the mean value of acquaintance rate, it can be found that 49.08% of antihistamine brands, 48.58% of anti-infective brands, 47.11% of analgesic brands and 45.23% of antipsychotic brands were recognized by the survey population on average. Although the difference is very small, H1 antihistaminic brands are found to be having the highest acquaintance level and antipsychotic drug brands are at the lowest acquaintance level. (Table 3)

The high acquaintance of analgesic, H1 antihistaminic, antipsychotic, anti-infective brands was significantly correlated (P<0.05) with male gender and lower education qualification. High acquaintance of the brands from the later three therapeutic categories was significantly correlated (P<0.05) with older age also. (Table 4 and 5)
Figure 3

Table 3: Medicine acquaintance rate of drug brands belonging to therapeutic categories like analgesics, H1-antihistaminics, antipsychotics and antibiotics.

Figure 4

Table 4: Analgesic, H1 antihistaminic, antipsychotic drug brand acquaintance rate with respect to age, gender, education.

Figure 5

Table 5: Medicine acquaintance rate of drug brands belonging to therapeutic categories like analgesics, H1-antihistaminics, antipsychotics and antibiotics.

Figure 6

Table 6: Analgesic, H1 antihistaminic, antipsychotic drug brand acquaintance rate with respect to age, gender, education.
DISCUSSION

The acquaintance rate of drugs found in this study agrees with the self medication rates established by a previous study. The self medication rates for ciprofloxacin, doxycycline, amoxicillin, and metronidazole were 4%, 5%, 2% and 9% respectively. All these four drugs are found in the most highly acquainted drugs’ list (>50% - 97%) here. The self medication rates found for ampicillin, azithromycin and cefadroxil were 1% each. The self medication rates for erythromycin, fluclaxacinil, tetracycline, cefixime, cefpodoxime and cotrimoxazole were less than one percent. Only cefuroxime showed self medication prevalence zero percent (Chowdhury et al, 2010). These antimicrobials having 1% or less self medication rates appeared in the list for less acquainted (<50%) drugs.

The medicines having higher self medication rates showed misuse incidences in the previous study, as for example, self medicating with ciprofloxacin to treat menstrual irregularity and abdominal pain, metronidazole to treat fever and menstrual irregularity, amoxicillin to treat viral diseases, ampicillin to treat scabies, azithromycin to treat pain etc. (Chowdhury et al, 2010).

Paracetamol, aspirin, chlorpheniramine, domperidone, cetirizine, prochlorperazine are all established OTC drugs in the developed world (US Food and Drug Administration 2011; Department of Health and Ageing, Australian Government 2011). The public’s high acquaintance rate with drugs like paracetamol, aspirin, chlorpheniramine etc. indicate their extensive over the counter use in this country.

Doxycycline resistance have been increasing steadily since the 1970s worldwide (Haider et al., 2004). Resistance to metronidazole is the most common type of resistance, with worldwide rates (Nagai et al., 2007) of 10 to 90%. There is already a high prevalence (77%) of metronidazole resistance in Bangladesh due to frequent use of metronidazole for intestinal problems (Fedorak et al., 1997). It has been said that the overuse of ciprofloxacin could lead to the emergence of resistant mutants (Nahar et al., 2004). Amoxicillin resistance has already been identified in Bangladesh (Dore et al., 1997; Fedorak et al., 1997; Nahar et al., 2004). Hence, the high extent of lay knowledge on Doxycycline, Ciprofloxacin, Amoxicillin, Metronidazole and other antibiotics poses threat of random use and resistance development among people of Bangladesh.

Previous study on purchase pattern of antibiotics shows the public is buying medicines absolutely without any prior consultation with health professionals, not even with retail medicine sellers (Chowdhury et al, 2010). This might implicate that some people are relying on their own lay knowledge for choosing and buying medicines. Hence, it can be concluded that anti-infectives, antipsychotics and some selected NSAIDs deserve a prescription only status in this country. Focusing on education of health professionals only should not be the only way to tackle the misuse incidences.

From this study, it be inferred that the over-the-counter availability of antimicrobials and other drugs not recommended for self medication has given rise to high level of misuse in developing countries. Resistance in major pathogens such as Neisseria gonorrhoeae, Streptococcus pneumoniae, Shigella species and Salmonella typhi has been reported for the first time from developing countries (Sturm et al, 1997). Over the counter availability of several other drugs (e.g. diclofenac, diazepam etc.) may also bring about hazardous effects. Survey in several districts of Bangladesh showed that 105 people died from perforation of a peptic ulcer and several thousand suffered from peptic ulceration after injudicious consumption of non-steroidal anti-inflammatory drugs like diclofenac (Daily Shangbad, 1993). Diazepam is among the commonest agents in Bangladesh used for poisoning (Gilbertson et al., 1996). Both diclofenac and diazepam are available over the counter in Bangladesh, while they are available through prescription only in developed countries. Again both diclofenac (48.85%) and
diazepam (54.18%) have high acquaintance rates among people. Although Diclofenac has a rate of 48.85% acquaintance, a previous study found 72.3% of patients in Bangladesh who took diclofenac did so by personal discretion and not by doctor’s prescription (Chowdhury et al., 2010).

Tramadol, Pizotifen and Ketorolac are not recommended for self medication. These three drugs showed less than 21% acquaintance rate. Self medication of paracetamol and aspirin is allowed everywhere in the world and their acquaintance level is high, 97.49% and 82.64% respectively.

Among H1-antihistaminics, chlorpheniramine, loratadine and cetirizine are approved agents for self medication worldwide, their acquaintance rates are 76.36%, 32.53% and 59.41% respectively. Although desloratadine and promethazine are not recommended for use without prescription, they have high acquaintance rates, i.e. 19.35% and 42.78% respectively. The self medication rate predicted for promethazine was 85.9%, this drug is extensively used for treating cough in Bangladesh.

From among antipsychotics, amitriptyline, diazepam, clonazepam and midazolam have the highest acquaintance rates. None of these drugs are recommended for self medication, but people can purchase them whenever they wish. All these drugs can cause poisoning if used inappropriately. Domperidone and prochlorperazine, which are used to treat nausea, have high acquaintance rates.

For all therapeutic categories, the acquaintance of drugs was significantly higher among people with lower educational qualifications than people with higher educational qualifications. Previous studies observed that lower educational qualification made people less cautious and aware about the classification of drugs based on safety and untoward effects of the indiscriminate use of drugs (Sahebi et al., 2009). Further studies should investigate whether the less educated people garnered such high acquaintance with drugs due to lack of cautiousness or ignorance of the dangerous impact of indiscriminate drug use. People with lower educational qualification should be made aware about the basic difference between formulations of OTC (over-the-counter) and prescription drugs. The public should understand that the prescription drugs can’t be randomly used like OTC drugs and crude drugs like that made available by ayurvedic, unani systems.

The acquaintance of pain relieving, antipsychotic and H1-antihistaminic agents was significantly higher among men than women.

Although previous findings showed age as a predictor of a subject's accuracy about health information (Lieberman et al., 1992), age became a factor for acquaintance here only in case of antipsychotics. High acquaintance of only antipsychotic brands was significantly correlated with older age (Table 4). 90% of British and American adolescent students recognized paracetamol as a common agent employed in self poisoning (Gilbertson et al., 1996). In this study 97% of the subjects could recognize paracetamol as a painkiller agent. 76.36% people could recognize chlorpheniramine and 67.15% recognized ciprofloxacin. Hence pain relieving agents, H1-antihistaminics and anti-infectives are extremely well known irrespective of age.

Greater propensity towards self-medication may have serious consequences for public health in developing countries. The challenge and opportunity for the Bangladesh government, healthcare professionals and providers of self-medication products are to have a responsible framework in place for self-medication.

There is no legislation in Bangladesh regarding rational use of prescription drugs. Despite frequent mention of the danger of the over the counter availability of antibiotics, sedatives etc. in Bangladesh, no long term vision, rules and regulations for protecting the nation against easy availability of prescription drugs has been suggested by any responsible authority of the country. We recommend that the Ministry of Health and the Directorate of Drug Administration in Bangladesh immediately execute OTC and prescription-only status of drugs in the retail shops where drugs are sold. Rules and regulations should be made so that qualified pharmacists consult the patients when they come to purchase the drugs to retail shops. Cautionary advice in the form of advertisements or leaflets should be supplied to the general population against indiscriminate use of drugs.

This study only looked for drug name recognition rate among general population of Bangladesh. The sources of acquaintance with drugs, the medical history of the survey population were not analyzed. Further studies are needed to correlate the medication knowledge of Bangladesh population with their medical history, livelihood, reading materials etc. The awareness level of the adverse effects of antibiotics and sedatives among Bangladesh people need to be studied.
References

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