

# An elucidation of the major symptoms treated by self-medication of pain relieving and H1 antihistaminic drugs in Bangladesh.

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## Abstract

As we move towards a culture of increased self-management of minor illness, the demonstrated need for improved pharmacovigilance of non-prescribed medicines must be addressed. Hence, the objectives of this paper are to present data on the self-reported use of prescribed and over-the-counter pain relieving agents and H1-antihistaminic drugs among general people and to examine factors associated with the use of prescribed drugs, over-the-counter painkillers and cough, cold and allergy treatments. Aspirin was significantly more self medicated for headache and Diclofenac for pain than other symptoms. Paracetamol, Pizotifen, Tramadol, Chlorphenamine and Promethazine were significantly more used in fever, migraine, fever, cold and cough respectively rather than other symptoms. Loratadine, Desloratadine and Cetirizine were significantly more used in allergy rather than other symptoms. The medicines having higher popularity i.e. acquaintance rate showed higher self-medication rate. The statistics presented here can be a useful probe for law enforcers and public health campaigns.

**Keywords:** Self-medication, pain relieving, H1 antihistaminic drugs

## 1. Introduction

Previous study findings have demonstrated a high level of self-medication amongst the general public in Bangladesh, with significant potential for inappropriate use (Nishat Chowdhury *et al.*, 2009; 2005 & 2011). As we move towards a culture of increased self-management of minor illness, this demonstrated need for improved pharmacovigilance of non-prescribed medicines must be addressed (Terry Porteous *et al.* 2002). According to previous reports, half and quarter portion of the illness of the young population in Bangladesh was due to fever and headache respectively (Nishat Chowdhury *et al.*, 2009). Among the next common illness were skin disease (one tenth of the ill population) and cough/cold (3%). Since NSAIDs and other pain relieving agents are used in fever, headache and H1 antihistaminics are self medicated for cough, cold and allergy-related skin disorders, so, the present research work was carried out to study usage of NSAIDs and other pain relieving agents, H1-antihistaminics etc. Hence the objectives of this paper are to present data on the self-reported use of prescribed and over-the-counter pain relieving agents and H1-antihistaminic drugs among general people and to examine factors associated with the use of prescribed drugs, over-the-counter painkillers and cough, cold and allergy treatments.

## 2. Methods

The study was conducted among the students of colleges and universities in Dhaka and Bogra city. 11 highest selling and most commonly used pain relieving agents and H1 antihistamines were printed in the questionnaire. The drug brands were selected after careful consultation with product managers and in house sales data of reputed pharmaceutical companies. This study included OTC analgesics like Aspirin, Paracetamol and OTC H1-antihistamines like Chlorpheniramine, Loratadine, Cetirizine for survey. This study also included Prescription pain relieving drugs like Tramadol, Pizotifen, Ketorolac, Diclofenac, and Prescription H1-antihistamines like Desloratadine, Promethazine in this survey.

The sample students were asked whether they had used any of the drugs within 6 months prior to survey date. When said yes, they were asked if they had any prescription for using those drugs. By snowball sampling method, 758 students were found who had used at least one of the 11 drugs listed; all of them were interviewed within June 2009. Multiple cases of different drugs from one person was considered separately. The symptoms, diseases and length of therapies of the respective drugs were also noted.

### 2.1 Data management

Supervisors in the field regularly reviewed questionnaires. Field researchers double-checked the responses 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.

## 2.2 Data analysis

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

## 2.3 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. The names of the brands from different pharmaceutical companies have not been elucidated. The analysis was done on the basis of generics.

## 3. Results

More than 50% of the survey population was male (55.8%, n=423). More than 50% of the population was of age 22-32 (51.7%, n=392). The rest of the population was from age group 14 -21. (Table 1 & 2)

**Table 1.** Age and gender distribution among the survey population descriptive data

<b>Characteristics Based on all sampled individuals (n=758)</b>	
Gender	Age
Male	14-21
Female	22-32

**Table 2.** Rate of self-medication among the survey population

<b>Therapeutic category</b>	<b>FDA-defined Legal Status</b>	<b>Name of drug</b>	<b>Number of Population Sampled</b>	<b>% self medicated (n)</b>	<b>% acquaintance rate (n)</b>
Pain relieving agent	OTC	Aspirin	284	83.1 (236)	82.64 (790)
		Paracetamol	587	67.8 (398)	97.49 (932)
	Prescription-only	Tramadol	8	100 (8)	20.50 (196)
		Pizotifen	7	71.4 (5)	17.36 (166)
		Ketorolac	12	66.67 (8)	11.19 (107)
		Diclofenac	155	72.3 (112)	48.85 (467)
H1-antihistamines	OTC	Chlorphenamine	177	79.1 (140)	76.36 (730)
		Loratadine	38	76.3 (29)	32.53 (311)
		Cetirizine	142	79.6 (113)	59.41 (568)
	Prescription-only	Desloratadine	7	85.7 (6)	19.35 (185)
		Promethazine	92	85.9 (79)	42.78 (409)

A previous study investigated the acquaintance rate of OTC and prescription pain relieving agents and H1-antihistaminics. Aspirin, Pizotifen, Ketorolac, Diclofenac, Chlorphenamine, Loratadine, Cetirizine and Promethazine showed a significant correlation with the medicine brand acquaintance rate (Table 3).

When people suffered from fever, similar proportions used Paracetamol with prescriptions and without prescription although odds

ratio is 2.33 but no significant difference was found. When people suffered from headache, similar proportions used Paracetamol with prescriptions and without prescription. When using aspirin in headache, significantly higher percentage of people self medicated (OR =0.35 and p-value 0.006) compared to prescription use. When people suffered from pain and used Diclofenac, significantly higher proportion of the population self medicated (OR= 0.42, p=0.014) (Table 4).

**Table 3.** Self medication vs Acquaintance rate

No	Name of drug	% self medicated (n)	% acquaintance rate (n)	Statistical Significance of Self medication rate vs Acquaintance rate (No 1-8 drugs)	Significance of all 11 drugs
1	Aspirin	83.1 (236)	82.64 (790)	0.036	0.470
2	Pizotifen	71.4 (5)	17.36 (166)		
3	Ketorolac	66.67 (8)	11.19 (107)		
4	Diclofenac	72.3 (112)	48.85 (467)		
5	Chlorphenamine	79.1 (140)	76.36 (730)		
6	Loratadine	76.3 (29)	32.53 (311)		
7	Cetirizine	79.6 (113)	59.41 (568)		
8	Promethazine	85.9 (79)	42.78 (409)		
9	Paracetamol	67.8 (398)	97.49 (932)	Excluded from significance measurement	
10	Desloratadine	85.7 (6)	19.35 (185)	Excluded from significance measurement	
11	Tramadol	100 (8)	20.50 (196)	Excluded from significance measurement	

In case of cold, prescription use of Chlorpheniramine was much higher than self medication, but the difference was not significant (OR= 2.62, p=0.069) (Table 4).

Almost equal portion (71%, 72%) of population used Cetirizine in allergy with and without prescription (OR= 0.92, p=0.848). In case of cough also, similar proportion of population used Promethazine with and without prescription (OR= 0.58, p=0.366) (Table 4).

Aspirin was significantly more self medicated for headache and Diclofenac for pain than other symptoms. When using Aspirin for headache and Diclofenac for pain, significantly more percentage self medicated rather than prescription use. Paracetamol, Pizotifen, Tramadol, Chlorphenamine and Promethazine were significantly more used in fever, migraine, fever, cold and cough respectively rather than other symptoms. Loratadine, Desloratadine and Cetirizine were significantly more used in allergy rather than other symptoms (Table 5).

#### 4. Discussion

Up to 70% of the population in Western countries uses analgesics regularly, for headaches, fever and pain. In Scotland 37% people self medicated with paracetamol and other non-prescription analgesics within two weeks (Terry Porteous *et al.*, 2005). 26% of Norwegian young people self-medicated with OTC analgesics on a daily or weekly basis (Frances V Abbott and Mary I Fraser, 1998). In Nepal Paracetamol and other NSAIDs were the drugs most commonly used for self-medication (Sharkar *et al.*, 2002). These studies show the high percentage of self medication rate of OTC analgesics. The present study also shows a high percentage self medication rate of OTC analgesics. In the present study, percent population self-medicated with paracetamol and aspirin, two non-prescription analgesics were 67.8% and 83.1% respectively within 6 months.

In a given week, a cough and cold medication was used by 10.1% of US children (Lucis Vemacchio *et al.*, 2008). Exposure was highest to first-generation antihistaminics (6.3%). The present study also shows high self-medication exposure to H1-antihistaminic cough-cold preparations. The self-medication rate of the widely used H1-antihistaminic cold remedy chlorphenamine was found to be 79.1% in the present study. US adults self medicated with cold medicines at 37% rate respectively (Over The Counter, 2011).

56% US adults self medicated with cough medicines. On the other hand, 85.9% Bangladeshis self medicated with Promethazine, the popular cough medicine of Bangladesh. Loratadine and Cetirizine, the two OTC allergy medicines were self medicated in 76.3% and 79.6% cases. In Australia, Promethazine was the most frequently cited antihistamine, followed by the combination therapies containing chlorpheniramine maleate (Pascale Allotey *et al.*, 2004). In the present study also, self-medication with Promethazine and Chlorpheniramine was high.

**Table 4.** Diseases, medication type and prescription applied

Disease category	Medicated with Paracetamol (%)	Logistic regression: Odds ratio (confidence interval)	p-value
Fever:			
Without Prescription	95	-	-
With Prescription	98	2.33 (0.78, 6.97)	0.128
Headache:			
Without Prescription	10	-	-
With Prescription	13	1.34 (0.52, 3.49)	0.545
Disease category	Medicated with Aspirin (%)		
Headache:			
Without Prescription	88	-	-
With Prescription	72	0.35 (0.17, 0.74)	0.006
Disease category	Medicated with Diclofenac (%)		
Pain:			
Without Prescription	81	-	-
With Prescription	63	0.42 (0.21, 0.84)	0.014
Disease category	Medicated with Chlorpheniramine (%)		
Cold:			
Without Prescription	70	-	-
With Prescription	86	2.62 (0.93, 7.38)	0.069
Disease category	Medicated with Cetrizine (%)		
Allergy:			
Without Prescription	72	-	-
With Prescription	71	0.92 (0.40, 2.13)	0.848
Disease category	Medicated with Promethazine (%)		
Cough:			
Without Prescription	77	-	-
With Prescription	67	0.58 (0.18, 1.89)	0.366

The medicines having higher popularity i.e. acquaintance rate showed higher self-medication rate. Self-medication of Paracetamol, Tramadol and Desloratadine did not correlate with the medicine brand acquaintance rate. Paracetamol is very well known with an acquaintance rate close to 100%, but its self medication rate is relatively low, that is, 67.8%. This indicates that some people are well acquainted with Paracetamol's name and use, but they do not use Paracetamol frequently. Tramadol and Desloratadine are both new drugs having very low acquaintance rate. But few users discovered their potency through unknown sources and self medicated with them.

The nonmedical use of a prescription or over-the counter (OTC) medication implies that the user is using it for reasons other than those indicated in the prescribing literature or on the box label (James and Steven, 2008). The abuse of these medications is a national issue. Nonmedical use may bring about health hazard and waste of money of the user. Serious side effects could arise from the inappropriate use of analgesics and H1 anti-histaminics, for instance through use when contraindicated or through drug–drug interactions. Previous work has shown that nonprescription analgesics are not always used optimally, with evidence of drug interactions, excessive dosing, and instances of contraindicated use (Terry Porteous *et al.*, 2005). In the present study evidence of nonmedical use was found. People tried Chlorpheniramine to treat pain and fever. Pizotifen and Tramadol were tried in fever.

Nonmedical use of Chlorphenamine for generating euphoria was reported in previous studies (James and Steven, 2008). Severe toxicity was reported from use of Chlorphenamine and related H1-antihistaminics due to both acute overdoses and when administered in correct doses for chronic periods of time (Veronic *et al.*, 2001). Tramadol toxicity has been one of the most frequent causes of drug

poisoning in Iran in the recent years (Shadina *et al.*, 2008). Tramadol is rarely the primary drug of choice, but it was abused by even physicians (Gregory *et al.*, 2004). CNS depression, cardiovascular collapse and respiratory depression, and hypothermia occurred in case of Pizotifen overdosage. Therefore, Chlorphenamine, Tramadol and Pizotifen are not harmless objects for trying randomly in random diseases (Griffiths *et al.*, 1987).

**Table 5.** Rate of self-medication among the survey population.

Drug	Major symptoms self medicated	Total Incidence of Self medication %n	Minor symptoms self medicated	Significance (Major symptom vs Minor symptoms)	
Aspirin	Headache	89	(210)	Fever, Pain	0.0
Paracetamol	Fever	91.4	(364)	Headache, Pain	0.0
Diclofenac	Pain	97.3	(109)	Fever, Headache	0.0
Ketorolac	Eye disease	50	(4)	Pain	0.0
Tramadol	Fever	100	(8)	x	Not applicable
Pizotifen	Migraine	60	(3)	Fever,Headache	0.0
Chlorphenamine	Cold	51.1	(71)	Cough, Influenza, Allergy, Asthma, Pain, Sedation, Fever, Headache	0.0
Loratadine	Allergy	51.7	(15)	Cough, Cold, Sedation	0.0
Desloratadine	Allergy	100	(6)	x	Not applicable
Cetirizine	Allergy	76.1	(86)	Cough, Cold, Asthma, Fever, Sedation	0.0
Promethazine	Cough	87.3	(69)	Cold	0.0

All the eleven drugs included in this study might give rise to toxicity if used inappropriately. But for OTC drugs like Loratadine, pharmaceutical companies in the western countries execute huge promotion. Therefore it is left upon the consumer's discretion to use OTC drugs with caution. In 1998 Schering-Plough invested \$186 million in promoting loratadine and saw company profits soar (Magyre, 1999). Prescription allergy medications fexofenadine, desloratadine, and cetirizine represent over 75% of the U.S. prescription antihistamine market (Danel and Anne, 2003).

Using high levels of OTC analgesics, including aspirin and acetaminophen, over long periods of time have been associated with dysphoric mood states (Azhar *et al.*, 1993). Aspirin and other NSAIDs are the predominant cause of gastric and duodenal ulcers. A 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. Paracetamol is now the most common drug in self-poisoning, with a high rate of morbidity and mortality. Some studies have recommended changing the legal status of paracetamol even to a prescription-only medicine. NSAIDs except aspirin and paracetamol use are not recommended for most patients with chronic kidney disease (Luis Alberto Garcý'a Rodrý'guez *et al.*, 1998). But the present study findings indicate random self-medication of Ketorolac and Diclofenac without medical supervision. Before prescribing NSAIDs like Diclofenac and Ketorolac, patients profile needs to be checked. There is risk of ischemic and hemorrhagic stroke upon ketorolac use (Breen *et al.*, 1986). NSAIDs cause substantial morbidity and mortality from upper gastrointestinal tract disease. Ketorolac has been singled out as an NSAID with a distinct gastrotoxicity profile (Seto *et al.*, 1997). NSAIDs are also a well recognized cause of hepatotoxicity (Schatz & Petitti, 1997). In case of pregnancy, the medicines must have to be screened by a medical professional and random use of the medicines under this survey is not recommended by proven literatures (De-Kun Li *et al.*, 2003 ; Clatts *et al.*, 2010 ; Acons *et al.*, 2006).

Young injection heroin users in Hanoi, Vietnam used promethazine to substitute for heroin when heroin was not available or when heroin was too costly or to augment the effects of an inadequate heroin dosing (Hansen *et al.*, 1998). It is dangerous because of promethazine's high risk for serious vein damage. Ethanol and promethazine together affect awareness of errors and judgments of performance in human. Suicide attempt and overdose with cetirizine were reported resulting in metabolic acidosis, hypokalemia,

convulsions and cardiac arrest.

With assessments of the extent of inappropriate use of both prescription and non-prescription medicines, awareness programs and “Prescription-only medicine” list and law should be formulated in Bangladesh. Hence this study elucidates the actual proportion of self medication of pain relieving and H1-antihistaminics agents in Bangladesh. The statistics presented here can be a useful probe for law enforcers and public health campaigns.

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