ORIGINAL ARTICLE

Association between Self-Medication Behavior and Adherence among Medical Students in Dhaka, Bangladesh

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Abstract

Background: Self-medication practice poses a positive impact when adequate patient adherence exists. As medical students commonly self-medicate, the aim is to find association between self-medication behavior and adherence among medical students in a private medical college in Dhaka, Bangladesh. **Materials and Methods:** This descriptive cross-sectional study was conducted among 204 medical students of Dr. Sirajul Islam Medical College, Dhaka, from October to December 2016. A pre-designed and pre-tested questionnaire was used for data collection. Data were analyzed using Microsoft Excel 2003 for counts and percentages. Association between self-medication behavior and adherence was assessed using Chi-square test. The statistical significance was set at $P \leq 0.05$. **Results:** Students practising self-medication was 81.4%, and prevalence was more among 3rd year students. Students obtained drug information from pharmacy retailers, and pharmacy was the main source for obtaining drugs without a prescription. Fever and headache (83.1%) were the most frequently reported illness. Commonly used drugs were antipyretics and analgesics among all students. Reasons for self-medication were minor ailments and quick relief. Adherence among 204 students was observed as, only 5.4% students never forget to take medicines, 18.6% do not change the dose, frequency or course duration, and 2.9% do not discontinue treatment without doctor's advice. 28.4% take doctor's advice when symptoms persist and 20.6% when adverse effects occur. There was a significant association of self-medication practice and adherence among students ($P < 0.05$). **Conclusion:** High prevalence of self-medication exists among medical students associated with low level of adherence. Students must be educated about improvement of adherence to benefit from self-medication.

Key words: Adherence, Bangladesh, medical students, self-medication behavior

INTRODUCTION

Self-medication is the consumption of any medicine by a patient for the management of self-diagnosed health issues. Majority of the drugs are recommended by the drug regulatory authorities to be safe and effectual if taken under a physician's supervision, while over the counter drugs are permitted to be taken without a prescription. World Health Organization (WHO) defines self-medication as the use of drugs to treat self-recognized disorders or symptoms, or the intermittent or continued use of a prescribed drug for chronic or recurrent diseases or symptoms. They also approved self-medication as part of self-care.[1] In the midst of escalating health care costs globally, self-medication has become an increasingly important option in the symptomatic management of common conditions. Self-medication encourages consumers to take an active role in their health.[2]

In a number of developing countries, many drugs are dispensed over the counter without medical supervision. In this case, self-medication provides a lower cost alternative for people who cannot afford the cost of clinical service.[3] The WHO has appropriately pointed out that responsible self-medication can help prevent and treat diseases that do

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not require medical consultation and provides a cheaper alternative for treating common illnesses.[4] The practice of self-medication must be based on the authentic medical information otherwise irrational use of drugs can cause wastage of resources, increased resistance of pathogens, and can lead to serious health hazards such as adverse drug reaction and prolonged morbidity.[5]

Self-medication practice is quite common among the health professionals as revealed by several studies.[6-8] Moreover, even medical students are prone to self-medication due to better exposure to medical knowledge. The prevalence rates of self-medication are high among medical students as evident from the previous studies, 92.7% in India,[9] 55% in Egypt,[10] and 88% in Pakistan.[11] Similar studies have been conducted in Bangladesh among various target populations. A high prevalence of use of antibiotics and other self-medicated drugs among common people were 26.69% and 73.31%, respectively.[12] Another study among medical and pharmacy students found 87% of them self-medicated.[13]

Medical conditions are effectively treated, only if patients adhere to their therapeutic regimen, including those who self-medicate. Hence, self-medication practice poses a positive impact provided that adequate patient adherence exists. In developing nations like Bangladesh with poor economic status and low health literacy rate, nonadherence is a common phenomenon among all patients. Behavioral interventions focus on helping patients build the skills necessary to adhere to a treatment regimen or perform self-care.[14] Thus, the primary goal of behavioral interventions is to improve knowledge, promote self-efficacy, and enhance self-care skills.[15] A study in Bangladesh states, at the same time the success of long-term maintenance therapy and good metabolic control depends largely on the patient's adherence and behavior in terms of keeping appointments, taking medication and making lifestyle changes. Some common reasons played a key role in the occurrence of nonadherence to medications in all populations such as patients forget to take their medicines, active rejection of therapy, expensive medication, a large number of medicines to be taken simultaneously, lack of health improvement, side-effects and absence of signs of illness.[16] British studies found that medication is not continued as prescribed in 50% of cases,[17] while nonadherence causes ~30-50% of treatment failures and 125,000 deaths annually.[18]

Medical students possess a good comprehension about diseases and drugs. Ease of internet access, past experience of treating ailments, drug advertisements may play an influential role in developing self-medication practice during their course of study. This population category will be our future drug prescribers and health care educators, so it is essential to evaluate their rationalism regarding utilization and prescription of medicines. Awareness of patient's priority should be present among medical students to avoid nonadherence when dealing with them. For this reason, they should maintain a positive attitude toward adherence when they self-medicate.

Studies on the relation between self-medication behavior with adherence are rare in developing countries like Bangladesh. The objective of this study is to assess the association between self-medication behavior and adherence among the medical students in a private medical college in Bangladesh.

MATERIALS AND METHODS

Study design

This descriptive cross-sectional study was conducted among the undergraduate medical students of Dr. Sirajul Islam Medical College, Dhaka from October to December 2016.

Data collection tool and technique

A pre-designed and pre-tested questionnaire comprising closed-ended questions was used. Students were informed briefly about the procedure of completing the questionnaire and were assured about the confidentiality of all information. After taking informed consent, the students voluntarily participated in the study. The questionnaire included students' demographic data along with two other sections, one related to self-medication behavior and the other related to adherence to treatment regimen. Only completed questionnaires were finally included in the study. Data were analyzed using Microsoft Excel 2003 and results were expressed using descriptive statistics such as frequency and percentages. All questions had multiple options, therefore, the sum of percentage is not always 100%. Mean age of participants was calculated with standard deviation. Chi-square test was used for testing the statistical significance. The statistical significance was set at $P \leq 0.05$.

Ethical considerations

The study was conducted following the general principles (section 12 and 26) of WMA Declaration of Helsinki.[19] The human subjects involved in this study did not use any harmful agents, nor any samples were collected from them. As the participants imparted information through a questionnaire, it was not required to take approval from the Institutional Ethics Committee to conduct this survey based research.

RESULTS

In this study conducted among 204 MBBS students, 89 (43.6%) respondents were males, and 115 (56.4%) were females. Their mean age was 21.5 ± 1.9 years (19-24 years) as displayed in Table 1. We observed that 166 (81.4%) of them practiced self-medication in the preceding 1 year.

Table 1: Profile of students and distribution of self-medication practice (*n*=204)

Demographic traits	*n* (%)		
Age (mean±SD) years	21.5±1.9		
Gender			
Female	115 (56.4)		
Male	89 (43.6)		
Parent's occupation			
Health personnel	27 (13.2)		
Non-health personnel	177 (86.8)		
Year of MBBS	**Self-medication**	**No self-medication**	**Total**
1st year	38 (79.2)	10 (20.8)	48 (100)
2nd year	55 (94.9)	03 (5.1)	58 (100)
3rd year	19 (95.0)	01 (5.0)	20 (100)
4th year	23 (67.6)	11 (32.4)	34 (100)
5th year	31 (70.5)	13 (29.5)	44 (100)
Total	166 (81.4)	38 (18.6)	204 (100)

n: Number of students, SD: Standard deviation

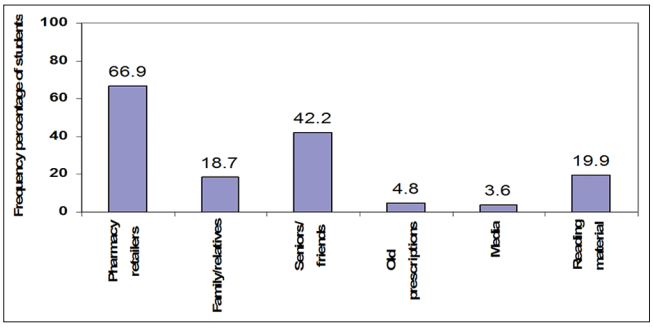

Figure 1: Sources of drug information

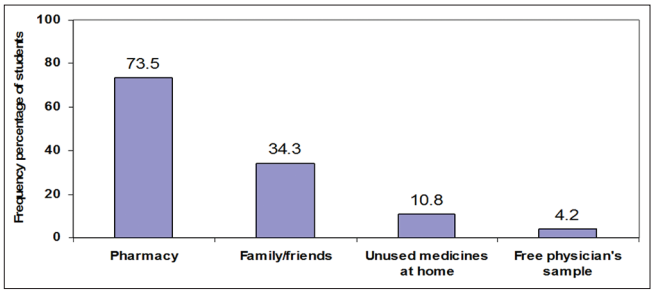

Figure 2: Sources of procurement of medications

Magnitude of self-medication was variable among the different years of students, being highest in 3rd year with 19 (95.0%).

As shown in Figures 1 and 2, pharmacy retailers were the most common source of drug information 111 (66.9%), followed by seniors and friends 70 (42.2%) and reading material 33 (19.9%). The main source for obtaining drugs was from a pharmacy without prescription 122 (73.5%) followed by friends and family members 57 (34.3%) and unused medicines at home 18 (10.8%) and lastly free physician's sample 7 (4.2%).

The study revealed, fever and headache 138 (83.1%) were the most common ailments followed by cold 112 (67.5%) and acidity 67 (40.4%) when self-medication was most practiced. Consequently, antipyretics were the most frequently used self-medicated drug from 1 to 5th year (78.9%, 89.1%, 94.7%, 69.6%, and 54.8%), respectively. This was followed by cough syrup in 1st year (47.4%), antiulcerants in 2nd year (61.8%), and 3rd year (63.2%), and analgesics were also commonly used from 1 to 5th year (42.1%, 45.5%, 63.2%, 56.5%, and 38.7%), respectively, as shown in Figures 3 and 4.

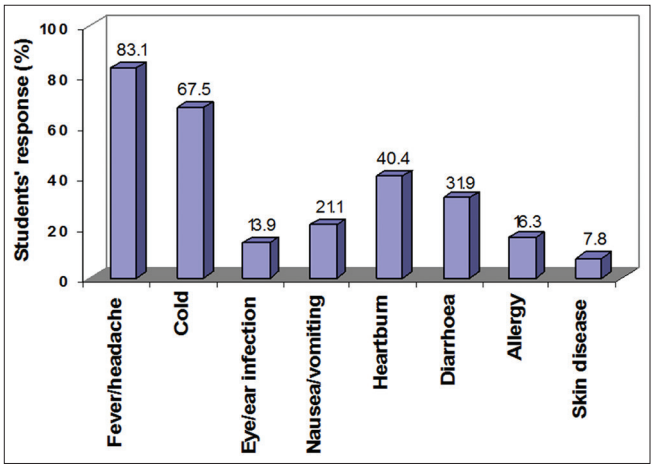

Figure 3: Indications for self-medication

Minor ailments in 23 (60.5%), 42 (76.4%), 13 (68.4%), 10 (43.5%), and 15 (48.4%) students of all years, respectively, was the prime reason for self-medication other reasons being quick relief in 7 (18.4%), 20 (36.4%), 10 (52.6%), 10 (43.5%), and 14 (45.2%) and previous experience in 10 (26.3%), 25 (45.5%), 11 (57.9%), 11 (47.8%), and 12 (38.7%)

Table 2: Reasons for self-medication

Reasons	*n* (%)				
	1st year	2nd year	3rd year	4th year	5th year
Cheap	7 (18.4)	6 (10.9)	4 (21.1)	2 (8.7)	1 (3.2)
Save time	5 (13.2)	8 (14.5)	6 (31.6)	4 (17.4)	5 (16.1)
Quick relief	7 (18.4)	20 (36.4)	10 (52.6)	10 (43.5)	14 (45.2)
Previous experience	10 (26.3)	25 (45.5)	11 (57.9)	11 (47.8)	12 (38.7)
Minor illness	23 (60.5)	42 (76.4)	13 (68.4)	10 (43.5)	15 (48.4)
Self confidence	1 (2.6)	2 (3.6)	1 (5.3)	5 (21.7)	1 (3.2)
Lack of trust on doctor	0 (0.0)	1 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)

n: Number of students

students from 1 to 5th year, respectively, as represented in Table 2. It was found that in majority of students, route of drug administration was oral route 153 (92.2%) in the form of tablet, capsule and syrup, followed by topical route 43 (25.9%) in the form of cream, ointment and gel, then rectal route 9 (5.4%) in the form of suppository and a few used inhalational route 2 (1.2%) in the form of inhaler. Among 166 (81.4%) students involved in self-medication, 157 (94.6%) practiced it sometimes and remaining 9 (5.4%) practiced it always.

This study also revealed that 102 (50%) study participants sometimes read the package inserts provided with the medicine, 19 (9.3%) read it always and 83 (40.7%) never read. Among the total of 204 students, 180 (88.2%) of them sometimes forget to take medication, 13 (6.4%) forget regularly and a few 11 (5.4%), students never forget. Table 3 depicts the adherence behavior of the respondents where they followed some initiatives to avoid forgetfulness during medicine consumption. Most of them, 139 (68.1%) keep medicine in a visible place, followed by the ones who prefer to take medication at same time daily 81 (39.7%), while some use reminder alarms 44 (21.6%) and, nonadherent ones 7 (3.4%) take no action to avoid forgetfulness. Many of them stated that they change course duration 96 (47.1%), change dose 53 (26.0%), change frequency of intake 46 (22.5%) without doctor's advice, while 38 (18.6%) change none of them without doctor's advice. It is also observed that 113 (55.4%) discontinue treatment on improvement, followed by 68 (33.3%) who discontinue to avoid adverse effects, 65 (31.9%) on no improvement, 19 (9.3%) to avoid polypharmacy and a few of them 6 (2.9%) do not discontinue without doctor's advice.

In the case of persistent symptoms, 58 (28.4%) take doctor's advice, followed by 54 (26.5%) who change the medicine and 50 (24.5%) stop taking medicine. Similarly, when adverse effects occur, 94 (46.1%) stop taking medicine followed by 43 (21.1%) change the medicine and 42 (20.6%) take doctor's advice. Regarding antibiotic usage, majority 112 (54.9%) complete the course followed by 62 (30.4%) who stop antibiotic immediately on recovery and 53 (26.0%) stop on improvement. 157 (77.0%) students plan to stock enough medicine before travelling anywhere, 37 (18.1%) prefer to keep reminder notes, 30 (14.7%) plan to use reminder alarms, and 2 (1.0%) have no plans.

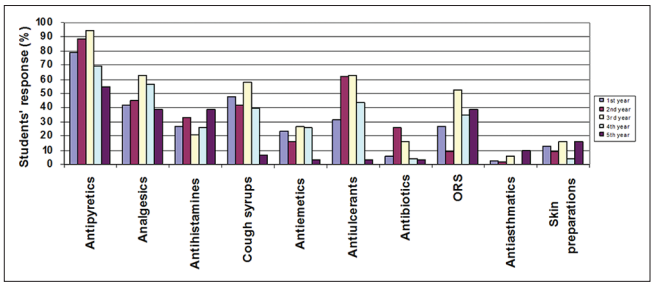

Figure 4: Drugs used for self-medication

In this study, a student is considered to be involved in self-medication who accepted that they practice such behavior. Furthermore, a student is considered strictly adherent who never forget to take medicines, take initiative to avoid forgetfulness, does not change treatment schedule nor discontinue treatment without doctor's advice, even when symptoms persist or adverse effects occur. There was a significant association between self-medication practice with adherence among the students ($\chi^2 = 4.6588$, df = 1, $P < 0.05$).

DISCUSSION

Self-medication is a common practice in Bangladesh, but there are few studies conducted here for evaluation of self-medication practice among medical students. In this study, the prevalence of self-medication among medical students was 81.4%. A Bangladeshi study[13] among medical and pharmacy students found all participating medical students practice self-medication. A recent study among university students in Bangladesh found 87.5% honors students self-medicated.[20] In other developing countries, self-medication among medical students are 82% in India,[21] 88% in Pakistan[11] and 84% in Nepal.[22] Comparable studies show 38.8% in Saudi Arabia[23] and 27% in China.[24] Various regional, demographic and personal factors influence the prevalence of self-treatment. Hence, it is difficult to analyze a global status.

Table 3: Adherence status of students (*n*=204)

Variables	*n* (%)
Avoid forgetfulness	
Take at same time daily	81 (39.7)
Keep invisible place	139 (68.1)
Use reminder alarms	44 (21.6)
None of them	7 (3.4)
Activities without doctor's advice	
Change course duration	96 (47.1)
Change dose	53 (26.0)
Change frequency	46 (22.5)
None of the above	38 (18.6)
Reasons for discontinuation of medicine	
Improvement	113 (55.4)
No improvement	65 (31.9)
Avoid adverse effects	68 (33.3)
Avoid polypharmacy	19 (9.3)
Do not discontinue	6 (2.9)
Activities for persistent symptoms	
Stop the drug	50 (24.5)
Change the drug	54 (26.5)
Take doctor's advice	58 (28.4)
Activities when adverse effects occur	
Stop the drug	94 (46.1)
Change the drug	43 (21.1)
Take doctor's advice	42 (20.6)
Stop antibiotics	
On improvement	53 (26.0)
After recovery	62 (30.4)
After course completion	112 (54.9)
Plan before travelling	
Keep reminder note	37 (18.1)
Adequate medicine for trip	157 (77.0)
Reminder alarms	30 (14.7)
No plans	2 (1.0)

n: Number of students

Our general prediction is such that senior medical students are more likely to be involved in self-medication practice due to more knowledge of drugs and related diseases. In our study, it is different, as we found that 1st, 2nd, and 3rd year students show a higher involvement in self-medication than 4th year and 5th year students which are unlikely to be influenced by their parents' medical profession as only 27 (13.2%) of them out of 204 students were doctors, dentists, nurses, and paramedics. In fact, it might be due to easy availability of medical information. The reason why senior students showed less involvement in self-medication maybe due to they possess deep knowledge about adverse effects of drugs, drug interactions and also the merits and demerits of self-medication. A study[25] showed similar outcome where junior students practiced self-medication more than their senior counterparts. Another study has reported significantly higher prevalence of self-medication in senior medical students (79.31%) compared to their junior group (41.67%).[26]

Advice from the pharmacy retailers (66.9%) was the prime source of drug information similar to an Indian research[9] (95.8%) and not in accordance to 54.63%,[27] 53.1%[28] which showed old prescriptions being the most common source. A pilot study in Bangladesh[29] observed self-decision (72.7%) as the most common source of drug information, probably because the respondents were senior students who have more knowledge about medicines and are confident enough to diagnose illness themselves. Main source of obtaining medications is from pharmacy (73.5%) which is accordance with a study (65.2%).[13] This is due to easy access of all medications, without prescriptions from the pharmacies and absence of strict monitoring of regulatory policies about prescriptions and over the counter sale of medicines.

Fever and headache were the most common indications for self-medication. Several studies[21,25,28-31] have observed a similar finding in contrast to another work.[27] which stated cold and cough as the most common illness. Antipyretics and analgesics were most commonly used among the participants like other researchers found[10,25,27,31] compared to another research[26] where use of antibiotics was the most. Students always prefer to treat their illness quickly to avoid visiting the physicians. Hence, the reason for self-medication reflect the same, as in other similar works[21,26,28,32] but contrast with some studies.[33-35]

Taking medicines both with or without prescriptions and doctor's advice is beneficial provided that a patient is an adherent to one's regimen. In this study, adherence has also been studied among the participants. The observations regarding reading and following the package inserts are analogs with earlier studies[36] and in contrast with other studies.[25,30] A minority group with high adherence (5.4%) never forget to take medicines[37,38], but majority forget sometimes or regularly, and all participants plan to avoid forgetfulness, mainly by keeping medicines in a visible place (68.1%).[39,40] 18.6% of students do not change any duration, dose and frequency of regimen without doctor's advice, neither do a minute proportion of 2.9% discontinue treatment without advice due to any reason, as shown in a research work.[10]

About 28.4% of students always take doctor's advice when symptoms are not relieved, whether they change (26.5%) or discontinue (24.5%) the medicine or do neither of them, which is similar to a study in India[22] where 38.7% students discontinued treatment without advice in case of persistent symptoms. When adverse effects occur during treatment, 46.1% stop the medicine, 21.1% change, and 20.6% take

doctor's advice. This is in accordance to the findings in a study,[30] where 53.3% stopped medication and consulted the doctor, while 26.1% started a new medicine. In the case of antibiotics, 54.9% complete the course and 30.4% stop immediately on recovery which is analogs to another study.[41] Travelling plans include enough medicine stock for trip (77.0%) in majority of students.

CONCLUSION

This study perceived the high magnitude of self-medication among medical students associated with low level of adherence. This may lead to the occurrence of more drug adverse effects and drug resistance leading to the declination of patient's trust on doctor. To prove self-medication beneficial, especially in the case of chronic illness, the level of adherence should be improved. This achievement is possible only by educating the medical students during the entire MBBS course duration and conducting workshops on self-medication schemes and rational use of medicines to ensure better adherence. This category of future physicians can build up strong doctor–patient relationships and thus, implement adherence among themselves as well as the patients.

All present findings are based on a single center study in Dhaka, Bangladesh. More studies in multiple centers need to be conducted among medical students all over the country to visualize prevalence of self-medication and various levels of adherence among a large scale target population.

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