

PREVALENCE AND UNDERLYING ASPECTS OF SELF-MEDICATION IN DHAKA, BANGLADESH: A CROSS SECTIONAL ANALYSIS

Moynul Hasan^{1*}, Md. Mahmudul Islam², Md. Belal Hossain³, Sanjida Akter Hena³, Md. Mofazzal Hossain³, Hajera Khatun³ and Murad Hossain³

Abstract

Now-a-days, self-medication is one of the most common public's health egresses. The intention of this study was to determine the prevalence and causes of self-medication in the community setting of Dhaka, Bangladesh. This study was conducted by a random selection of 568 participants over a period of 3 months along with their non-prescription drug list to assess their self-medication pattern. The percentage of respondents who seek for self-medication was a bit higher in male (73.17%) ($p=0.014$) compared to female (63.05%). The majority of the respondents was practicing self-medication for illness too trivial for consultation (34.78%) followed by the old prescription for the same illness (18.47%). Although antipyretic was the mostly used (47.82%, $Z=0.027$), yet anti-ulcerant (13.85%, $Z=0.65$), antihistamine (8.96%, $Z=-0.31$) and analgesics (8.69%, $Z=0.45$) covered the maximum share of the self-medicated drugs. Most of the participants relied on self-medication for fever (19.29%, $Z=0.025$), headache (17.39%, $Z=-0.79$) and cough (15.76%, $Z=0.65$) on a priority basis. In order to improve the situation, awareness about the advantages and disadvantages of self-medication among the population is warranted. Drug administration of Bangladesh should implement their regulatory controls immediately on the distribution and selling of drugs used by self-medication to reduce its frequency.

Key words: *Self-medication, Non-prescription drugs, OTC drugs, Misuse, Dhaka.*

Introduction

Self-medication is a global phenomenon and is also a potential contributor to human pathogen resistance to antibiotics. It is basically, the treatment of common health problems with medicines especially designed and labeled for use without medical supervision and approved as safe and effective for such use (Vizhi 2010 and Hughes 2001). According to the WHO guidelines, rational use of self-

¹Department of Pharmacy, Jagannath University, Dhaka-1100, Bangladesh

²Department of Pharmacy, Daffodil International University, Dhaka-1207, Bangladesh

³Department of Pharmacy, Dhaka International University, Dhaka-1213, Bangladesh

* Corresponding Author: Moynul Hasan, Email- 02mh1985@gmail.com

medication can facilitate in preventing and treating diseases that do not necessitate medical references and abridge the increasing pressure on medical services for an alleviation of minor complaints especially when resources are defined (Rani 2017). Previous studies reveal a lot of underlying reasons behind the self-medication and most of them are the urge of self-care, commiseration toward family members, insufficient health services, immiseration, lack of education, false believes, all-encompassing advertisement for drugs, avoiding crowd at Out-Patient Department (OPD) and as well as saving time (Solomon 2003 and Phalke 2006).

For the efficient and immediate relief of symptoms and to reduce the unnecessary burden on healthcare service centers, World Health Organization (WHO) promotes the use of self-medication without medical consultations particularly in rural and remote areas (Rani 2017). In developed as well as developing countries self-medication practices now have become a quite usual practice (Phalke 2006, Shahzad 2011 and Helal 2017). In developing countries, many drugs are prescribed as over the counter without medical supervision. Therefore, self-medication has become an alternative source of reliability for those people who cannot afford the toll of clinical services (Keen 1994). This is the main reason in economically stripped countries, that most recurrences of sickness are addressed by self-medication (Ferner 1994 and Bruden 1988).

In developing countries, self-medication is a crucial health issue (Asseray 2013 and Heller 2012). This may lead to detain in care questing which results in paradoxical economic loss due to delay in the diagnosis of inherent conditions and proper treatment. Also, self-medication can drive to the interaction between drugs which would be disallowed. Not only these, applying self-medication for drugs like antibiotics might lead to antibiotic resistance; and hence, that requires to assure on such practices (Hughes 2001, Greenhalgh 1987 and Deshpande 1997). Few studies comported at the community levels in Bangladesh to appraise the dimension of self-medication patterns (Alam 2015). Over-the-counter (OTC) drugs are medicines that sold directly to consumer without a prescription from a healthcare professional. Since there are no strict regulations about the selling and distribution of Over the counter (OTC) drugs or Non-prescription drugs in Bangladesh, thus people can purchase drugs like sedatives, antimicrobials without prescription even at the remote parts of the country. In Bangladesh, the prevalence of self-medication is thought to be high, usually attributed to the fact that most drugs can be obtained from the pharmacies without prescription (Godinho 2017 and Ganguly 2011). As a result, minor illnesses are treated with antimicrobials that lead a potential harm to the individual as well as the society at large. Findings from such studies will render useful insight on the fence for which patients haunted to this practice and might help the regulatory authorities to modify the list

of essential medicines, and confirmed a safety uses of over-the-counter drugs. With this downfall, the aim of the present study was to forecast the prevalence of self-medication in Dhaka city, Bangladesh and the associations between self-medication with their underlying reasons.

Material and Methods

A quantitative cross-sectional interview-based study was conducted on a randomly selected samples from Dhaka district, the capital of Bangladesh (Geographical coordinates are Latitude: 23°42'37" N, Longitude: 90°24'26" E and Elevation above sea level: 23 m = 75 ft.) during September to December 2016. The survey was conducted in accordance with the International Conference on Harmonization (ICH) guidelines for Good Clinical Practice (GCP) and in compliance with the Declaration of Helsinki and its further amendments (Ethik 2015). The study protocol was reviewed and approved by the Bangladesh Medical Research Council (BMRC).

Sampling procedure and frame

As the rate of self-medication is found to be high within young and middle-aged adults, thus Bengali-speaking individuals, within the age limit of 20 to 50 years old was the targeted participants (Ira 2015). The 'samples' recruitment was continued by random selection in each step until we reached the intended number of participants. Participants were given a covering letter explaining the purpose to the study and conforming to the confidentiality of information. In case of unavailability of the touchstones of samples, he or she was substituted by another randomly selected person. The questionnaires were appraised for its completeness, and only the finished questionnaires were considered for the final analysis.

Statistical basis of the sample size: $n = z^2 pq/d^2$. Where, n = Sample size; z is the confidence limit, p is the prevalence rate, q = 1-p; d is the accepted standard error. Although 296 (considering z = 1.96, p=0.27, q = 0.973 and d= 0.05) (Abay 2010) samples were sufficient, to ensure more representative data, we selected a larger sample size of more than 500 for this study.

Questionnaire development and contents

A self-administered questionnaire, which had been developed and previously used by (Klemenc-Ketis 2011) was used with slight modification for data collection. Before the interview, the intention of this study was clarified and a verbal consent was taken from the participants. Questionnaire was placed by the interviewer to

the individual respondents and their answers containing data sheet were recorded. The questionnaire was made up of two distinct question sections with “Likert scale”. The first section asked for socioeconomic and demographic data, including age, gender, ethnic group, educational level, monthly income, etc. In the second, a series of questions with Likert scale was used to ask about their self-medication, type of drug intake, indication, dose and dosage, any side effect, consultation after facing any side effect, current drug therapy and where to get information regarding self-medication. Here, the predefined answer was set in such an order that, the respondent reads all the possible answers and to reduce selection bias of the first displayed answer. The data was then quantified and all the options given in the ‘other’ categories were identified and collated. Data collected from the participants were compiled and tabulated. The tabulated data were arranged as percent values for understanding and analyzed precisely. Besides the data collection, as part of social responsibility, the researcher observed if the patients were taking the prescribed medicines on due time (before the meal or after the meal) as recommended in the prescriptions, or if they had any idea of the effect of taking such medication.

Statistical analysis

All data were entered and analyzed using the SPSS software (Version 21.0; SPSS, Inc, Chicago, IL). Descriptive data analysis was conducted and reported as frequencies and percentage.

Results and Discussion

A total of 568 participants were approached regarding their self-medication behavior and out of 568 participants, 6.51% (n=37) did not respond at all, thus 531 (93.48%) were considered as sample. Out of which 61.77% (n = 328) were males and 38.22% (n = 203) were females. The average age of the respondents was (\pm SD) 25.36 ± 5.22 years. Among the study participants, 26.82% (n=88) male and 36.94% (n=75) female confirmed of not taking self-medication. Observation reveals that, majority of the participants (67.23%) were from secondary education group and largely the middle-income people (70.43%) were involved in the practicing of self-medication. The prevalence of self-medication among the study participants was 73.17% (n =240) in male and 63.05% (n=128) in the female. Thus, the data reveals that proportionately larger number of males were self-medicating than females (Table 1).

Table 1. Practice of self-medication of the respondents.

Item	Response	Male n (%)	Female n (%)	Total (%)	p value
Practice of self-medication	Yes	240 (73.17)	128 (63.05)	328 (61.77)	0.014*
	No	88 (26.82)	75 (36.94)	203 (38.22)	

n indicates the number of respondents. *p* value was determined using Chi-square Test. **p* < 0.05 was considered significant when compared between male and female groups.

Bulk number of participants practiced self-medication due to the illness being too niggled for reference (34.78%), followed by their former prescription for the same malady (18.47%). Furthermore, even to save time (14.94%) and to avert crowd at OPD (12.77%), they consider self-medication as the best solution. The background reasons of the particular subjects practicing self-medication are shown in Figure 1.

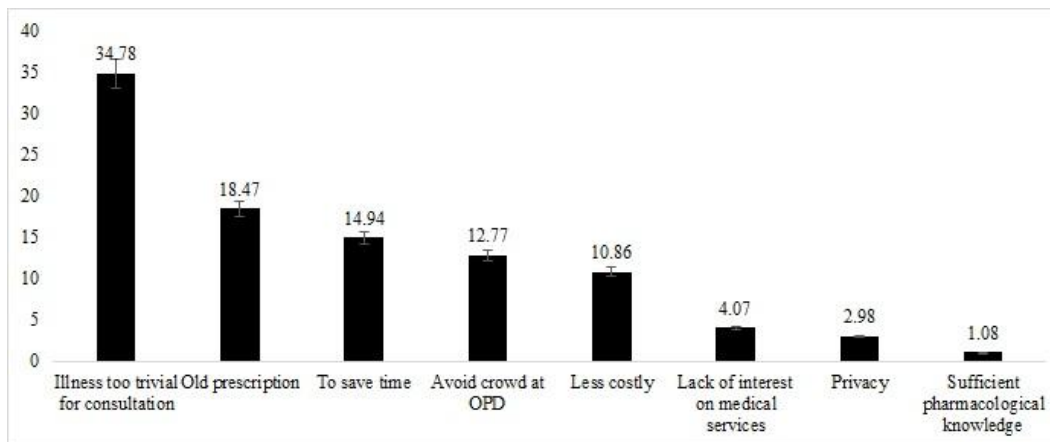


Figure 1. Reasons of study subjects indulged in self-medication (N = 368).

The most usual generic class of drugs that is self-medicated by the majority of the participants is antipyretics (47.82%), followed by antiulcerants (13.85%) and antihistamine (8.96%). Analgesics (8.69%) were also enlisted in the category of frequently used by participants. Surprisingly, it was ascertained that 6.79% of the participants responded to have self-medicated themselves with antibiotics (Figure 2).

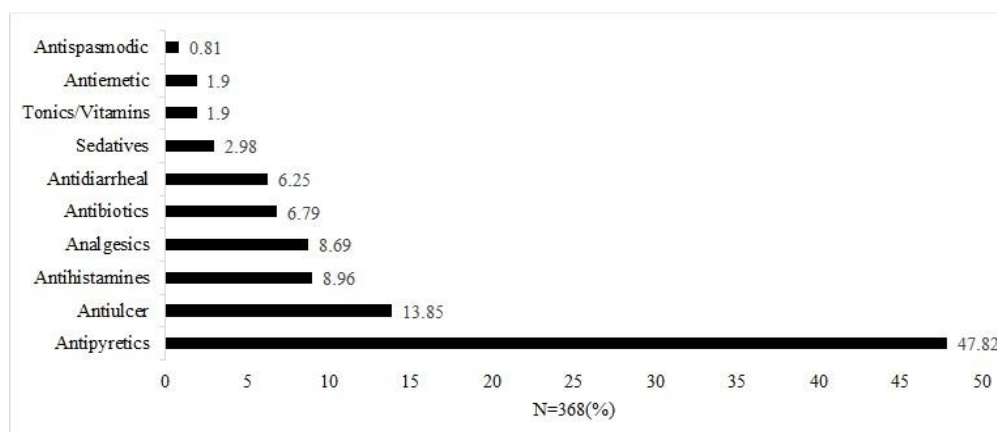


Figure 2. Generic categories of drugs commonly self-medicated (N = 368).

Fever was found to be the most frequent indication of self-medication (19.29%), followed by a headache (17.39%) and cough/cold (15.76), whereas diarrhea (13.31%) was next most usual indication for self-medication with antibiotics. The indication of self-medication has been enlisted in Table 2.

Table 2. Indications for self-medication (N = 368).

Indication	Male n=240 (%)	Female n=128 (%)	Total n=368 (%)	Z score	p value
Fever	50 (20.83)	21 (16.40)	71 (19.29)	0.025	0.30
Headache	39 (16.24)	25 (19.53)	64 (17.39)	-0.79	0.42
Cough	40 (16.66)	18 (14.06)	58 (15.76)	0.65	0.51
Cold	34 (14.16)	16 (12.5)	50 (13.58)	0.44	0.65
Diarrhoea	31 (12.91)	18 (14.06)	49 (13.31)	-0.30	0.75
Acidity	21 (8.75)	11 (8.59)	32 (8.69)	0.05	0.96
Pain condition	19 (7.91)	12 (9.937)	31 (8.42)	-0.47	0.63
Other	6 (2.5)	7 (5.46)	13 (3.53)	-1.46	0.14

Here, n indicates the number of respondents. *p* value was determined using Z score Test. **p* < 0.05 was considered significant when compared between male and female groups with two tail hypotheses.

Table 3 shows the attitude of the participants toward the practice of self-medication. In our study, the majority (60.59%) of the participants are habituated on the allopathic system followed by the ayurvedic system (29.34%) and then

homeopathic (10.05%). Only 30.43% participants reported to take medicine by consulting with the pharmacist whereas 25.54% participants were found to take medicine based on the previous prescription followed by 22.28% respondents taking medicine by reading packaging levels. It was also found that 9.23% participants usually take medicine by self-knowledge, and 6.79% take the advice from friends and family.

Table 3. Pattern of Self-medication

Factors	Male n=240 (%)	Female n=128 (%)	Total N=368 (%)	Z score	p value
Belief in type of medication					
Allopathic	139 (57.91)	84 (65.62)	223 (60.59)	-1.4 4	0.14
Ayurvedic	67 (27.91)	41 (32.03)	108 (29.34)	-0.8 2	0.40
Homeopathic	18 (7.5)	19 (14.84)	37 (10.05)	-2.2 3	0.02*
Belief in system of medication					
By consulting with pharmacist	72 (30.00)	40 (31.25)	112 (30.43)	-0.2 4	0.8
By previous experience	49 (20.41)	45 (35.15)	94 (25.54)	-3.0 8	0.002 *
By reading Packaging level	61 (25.41)	21 (16.40)	82 (22.28)	1.97	0.04*
By self-knowledge	26 (10.83)	8 (6.25)	34 (9.23)	1.44	0.14
By friends and family	17 (7.08)	8 (6.25)	25 (6.79)	0.30	0.76
By consulting doctor	6 (2.5)	4 (3.12)	10 (2.71)	-0.3 5	0.72
By reading newspaper	5 (2.08)	3 (2.34)	8 (2.17)	-0.1 6	0.87
Other	3 (1.25)	0 (0.00)	3 (0.81)	1.27	0.20

Here, n indicates the number of respondents. p value was determined using Z score Test. * $p < 0.05$ was considered significant when compared between male and female groups with two tail hypotheses.

There are a lot of previous analyses regarding the prevalence and the nature self-medication. This is an in-general trait of self-care behavior among the mass of various countries. As the health care services are often understaffed and unacceptable in rural areas, thus WHO promotes the practice of self-medication

not only for the effective and immediate relief of symptoms without medical references but also to abridge the burden on the health care sector. The purpose of our study was to evaluate the magnitude and pattern of self-medication practice among the mass of Dhaka city in order to make an association of self-medication medication variables with the demographic components.

Among the young adult students, gender is reckoned to be a crucial factor in self-medication study. Possible reasons behind the differences in this analysis, include male usually always want to get quick relief of illnesses by not visiting their doctors very often (Aswapokee 1990). They prefer to act on their own, regarding their symptoms as not very serious, and they are not being aware of possible side effects of these types of unprofessional treatments. In our study, the prevalence of self-medication was ascertained to be higher (73.12%) among the male population. Approximately same results were observed through different studies handled in developing countries like 25.4% and 43.2% in Ethiopia (Gutema 2011 and Smogavec 2010), 51% in Slovenia (Zafar 2008) and 55.3% in Pakistan (El-Ezz 2011).

In our study, the sickness being too minor for consultation was found to be the most frequent reason of self-medication (38.74%). Similar reflections were accounted in a few studies from India (Phalke 2006, Selvaraj 2014 and Aswapokee 1990). Participants from our study were prone to make unsupervised self-medication decisions, especially from same old prescription. In the present study, 18.47% participants report such cases, which is a very common source of information of self-medication. In studies from Ethiopia (Gutema 2011 and Zafa 2008), Pakistan (El-Ezz 2011) and Malaysia (Badiger 2012) previous experience with the sickness was noticed to be the most frequent reason for self-medication. In our study, to save time (14.94%) and to avoid the crowd at OPD (12.77%), found to be liable to self-medication.

In the southern part of India (Sarahroodi 2012) and Ethiopia (Gutema 2011), antipyretics are found to be the most common class of self-medicated drugs. Similar observations were found from 47.82% of the participants in our study. Although analgesics are found to be the most common drug class of self-medication in Iran (Lucas 2007), Mozambique (Kayalvizhi 2010) and Pakistan (El-Ezz 2011) but in our study population, it covers the fourth most common drug used as self-medication (8.69%, n= 32). Similar to the findings from India (Olayemi 2010) and Ethiopia (Gutema 2011), fever was the most usual indication (19.29%) for self-medication in our study. On the other hand, antiulcerants are the second most self-medicated drug (13.85%) and acidity is the most common indication in male participants than in female. In our analysis, antibiotics were self-medicated by 6.79% of the study participants. The antibiotic use for self-medication was reportedly lower in studies from developing countries (Buke

2005). In studies from Nigeria (Buke 2005), diarrhea and gastrointestinal infections were accounted as the common indication for antibiotic use whereas in Turkey (Skliros 2011) and Greece (Sarkar 2006), common cold replaces the use.

In the present study, 46.66% of the study subject felt that self-medication is a better way of consuming medicine rather than referring with chemists or local shop keepers. As a part of self-care, self-medication can be only rationalized by the judicial and rational use of medicines. Irrational use of medicines, may lead to serious consequences due to inadvertent drug poisoning. Not only these, 25.54% participants from the present study take self-medication based on the previous prescription, whereas 22.28% participants use drugs by reading packaging levels or inserts and these are much prevalent in male than in female ($p < 0.05$). In our study, around 60% participants rely on allopathic type of medicine system and same observation was found among the athlete from Sri Lanka (Fernando 2017).

The main drawbacks related to self-medication are decrement of resources as well as serious health hazards like drug dependency, untoward reaction, and extended suffering. Around the world, particularly in the developing countries where antibiotics are available without any prescriptions and are often self-prescribed, and thus contributing to antimicrobial resistance as one of a major public-health concerns. In order to retard the growing trends of self-medication, firm policies should be emphasized by forbidding the issue of medicines without an authenticated prescription. The youth, particularly the females should be educated to make cognizant about the significance of self-medication. However, more multicentric analysis is needed to be accomplished among the mass population at a large scale before inferring the diverse factors tempting the practice of self-medication in Bangladesh. Furthermore, the role of socio-economic positions and its regulation on practices of self-medication needs to be explored in the studies hereafter.

Conclusion

The prevalence of self-medication in the community among the study population was rather high. This may reflect the trends in the entire rural part of Bangladesh as well. Based on the report, self-medication was practiced mostly in people with less education and had low income. As this study is a small-scale investigation, further studies with larger population are needed to be done to aware people about the impending danger of self-medication. Pharmacists working in hospital and retail pharmacies can play a dominant role by educating patients and/or their attendants and customers. In simple ways, awareness about self-medication can also be created through print and visual media in order to prevent unnecessary practice of self-medication in the country.

References

- Abay, S.M. and Amelo, W. (2010). Assessment of self-medication practices among medical, pharmacy, and health science students in Gondar University, Ethiopia. *Journal of Young Pharmacists*, 2(3): 306–310.
- Alam, N., Nadia, S. and Riaz, U. (2015). Self-medication among medical and pharmacy students in Bangladesh. *BMC Research Notes*, 8:763.
- Asseray, N., Ballereau, F., Trombert-Paviot, B., Bouget, J., Foucher, N. and Renaud, B. (2013). Frequency and severity of adverse drug reactions due to self-medication: a cross-sectional multicenter survey in emergency departments. *Drug Safety*, 36(12): 1159-1168.
- Aswapokee, N., Vaithayapichet, S. and Heller, R.F. (1990). Pattern of antibiotic use in medical wards of a university hospital, Bangkok, Thailand. *Reviews of Infectious Diseases*, 12(1): 136–141.
- Badiger, S., Kundapur, R., Jain, A., Kumar, A. and Pattanshetty, S. (2012). Self-medication patterns among medical students in South India. *Australasian Medical Journal*, 5(4): 217–220.
- Bruden, P. (1988). World drug situation. Geneva: WHO.
- Buke, C., Hosgor-Limoncu, M., Ermertcan, S., Ciceklioglu, M. and Tuncel, M. (2005). Irrational use of antibiotics among university student. *Journal of Infection*, 51(2): 135–139.
- Deshpande, S.G. and Tiwari, R. (1997). Self-medication: A growing concern. *Indian Journal of Medical Sciences*, 51: 93- 6.
- El-Ezz, N.F. and Ez-Elarab, H.S. (2011). Knowledge, attitude and practice of medical students towards self-medication at Ain Shams University, Egypt. *Journal of Preventive Medicine and Hygiene*, 52(4): 196–200.
- Ethik, J.F.W. (2015). Declaration of Helsinki. Ethical Principles for Medical Research Involving Human Subjects, 18(1): 363-368
- Fernando, A.D.A., Bandara, L.M.H., Bandara, H.M.S.T., Pilapitiya, S. and de Silva, A.A. (2017). Descriptive study of self-medication practices among Sri Lankan national level athletes. *BMC Research Notes*, 10: 257.
- Ferner, R.E. (1994). Dispensing with prescriptions. *British Medical Journal*, 308: 1316.
- Ganguly, N.K., Arora, N.K., Chandy, S.J., Fairoze, M.N., Gill, J.P. and Gupta, U. (2011). Global antibiotic resistance partnership (GARP): India Working Group. Rationalizing antibiotic use to limit antibiotic resistance in India. *Indian Journal of Medical Research*, 134: 281- 94.

- Godinho, N., Bezbaruah, S., Nayyar, S., Gautam, J., Sachdeva, S., Behara, I., & Vong, S. (2017). Antimicrobial resistance communication activities in South East Asia. *British Medical Journal (Clinical research ed.)*, 358, j2742. doi:10.1136/bmj.j2742.
- Greenhalgh, T. (1987). Drug prescription and self- medication in India: An exploratory survey. *Social Science & Medicine*, 25: 307.
- Gutema, G.B., Gadisa, D.A., Kidanemariam, Z.A., Berhe, D.F. and Berhe, A.H. (2011). Self-Medication Practices among Health Sciences Students: The Case of Mekelle University. *Journal of Applied Pharmaceutical Science*, 01(10): 183-189.
- Helal, R.M. and Abou-El Wafa, H.S. (2017). Self-Medication in University Students from the City of Mansoura, Egypt. *Journal of Environmental and Public Health*, 7. DOI:10.1155/2017/9145193; ID 9145193.
- Heller, T., Muller, N., Kloos, C., Wolf, G. and Muller, U.A. (2012). Self-medication and use of dietary supplements in adult patients with endocrine and metabolic disorders. *Experimental and Clinical Endocrinology & Diabetes*, 120(9): 540-546.
- Hughes, C.M. and McElnay, J.C. (2001). Fleming GF. Benefits and risks of self-medication. *Drug Safety*, 24: 1027-37.
- Ira, I.J. (2015). Present condition of self-medication among general population of Comilla district, Bangladesh. *The Pharma Innovation Journal*, 4(1): 87-90.
- Kayalvizhi, S. and Senapathi, R. (2010). Evaluation of the perception, attitude and practice of self-medication among business students in 3 select cities, South India. *International Journal of Enterprise and Innovation Management Studies*, 1(3): 40-44.
- Keen, P.J. (1994). POM to P: useful opportunity or unacceptable risk. *Journal of the Royal Society of Medicine*, 87: 422-5.
- Klemenc-Ketis, Z., Hladnik, Z. and Kersnik, J. (2011). A cross sectional study of sex differences in self-medication practices among university students in Slovenia. *Collegium Antropologicum*, 35(2): 329-34.
- Lucas, R., Lunet, N., Carvalho, R., Langa, J. and Muanantatha, M. (2007). Patterns in the use of medicines by university students in Maputo, Mozambique. *Cadernos de Saúde Pública*, 23(12): 2845-2852.
- Olayemi, O.J., Olayinka, B.O. and Musa, A.I. (2010). Evaluation of Antibiotic Self-medication Pattern amongst Undergraduate Students of Ahmadu Bello

- University (Main Campus), Zaria. *Research Journal of Applied Sciences, Engineering and Technology*, 2(1): 35-38.
- Phalke, V.D., Phalke, D.B. and Durgawale, P.M. (2006). Self-medication practices in rural Maharashtra. *Indian Journal of Community Medicine*, 31: 34-5.
- Rani, M and Gupta, M.C. (2017). Knowledge, attitude, beliefs and use of over-the-counter drug products among medical undergraduates. *International Journal of Basic & Clinical Pharmacology*, 6(6): 1358-1362.
- Sarahroodi, S., Maleki-Jamshid, A., Sawalha, A.F., Mikaili, P. and Safaeian, L. (2012). Pattern of self-medication with analgesics among Iranian University students in central Iran. *Journal of Family & Community Medicine*, 19(2): 125-129.
- Sarkar, P. and Gould, I.M. (2006). Antimicrobial agents are societal drugs: how should this influence prescribing? *Drugs*, 66(7): 893-901.
- Selvaraj, K., Kumar, S.G. and Ramalingam, A. (2014). Prevalence of self-medication practices and its associated factors in Urban Puducherry, India. *Perspectives in Clinical Research*, 5(1): 32-36.
- Shahzad, H., Farnaz, M., Kazi, M.A., Ghazala, P., Abdul, H. and Safia, A. et al. (2011). Prevalence of self-medication and health-seeking behavior in a developing country. *African Journal of Pharmacy and Pharmacology*, 5(7): 972-978.
- Skliros, E., Merkouris, P., Papazafiropoulou, A., Gikas, A. and Matzouranis, G. (2011). Self-medication with antibiotics in rural population in Greece: a cross-sectional multicenter study. *BMC Family Practice*, 11:58.
- Smogavec, M., Softic, N., Kersnik, J. and Klemenc-Ketis, Z. (2010). An overview of self-treatment and self-medication practices among Slovenian citizens. *Slovenian Medical Journal*, 79: 757-763.
- Solomon, W. and Abede, G.M. (2003). Practice of self-medication in Jimma Town. *Ethiopian Journal of Health Development*, 17:111-6.
- Vizhi, S.K. and Senapathi, R. (2010). Evaluation of the perception, attitude and practice of self-medication among business students in 3 select Cities, South India. *International Journal of Enterprise and Innovation Management Studies*, 1(3): 40-4.
- Zafar, S.N., Syed, R., Waqar, S., Irani, F.A. and Saleem, S. (2008). Prescription of medicines by medical Students of Karachi, Pakistan: a cross-sectional study. *BMC Public Health*, 19: 162.