

RESEARCH ARTICLE

Comparison of practice and attitude of self-treatment in rural and urban population in Uttarakhand, India: A comparative study

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ABSTRACT


Background: Self-medication is a common practice and a potential threat for people worldwide. **Aims and Objectives:** The main aim of this study was to compare practice and attitude of rural and urban people regarding self-treatment with medicine in various districts of Dehradun, Uttarakhand, India. **Materials and Methods:** This was a cross-sectional survey-based comparative study. Using systematic random sampling technique, 500 rural and 500 urban participants were selected. Tools for self-treatment assessment were structured questionnaire including sociodemographic datasheet, practice questionnaire, and attitude Likert scale. **Results:** Participants in both groups were heterogeneous in nature and were comparable. The three most commonly used medicines for self-treatment by rural people were analgesic, antibiotics followed by antacids and for urban people drugs were analgesic, antacids followed by antibiotics, respectively. Significant difference (0.05*) was found in the overall attitude of rural and urban people as well. Rural people showed a neutral attitude, whereas urban people showed favorable attitude for use of medicine for self-treatment. **Conclusion:** Variations in culture and mindset of self-treatment in rural and urban people were seen. Most participants used analgesic, antibiotics, and antacids medication for self-treatment in both groups. Consulting a doctor, reviewing the package insert, and consulting a pharmacist were the most popular ways to know the dosage of medicinal items. Medical representatives and community pharmacies were the most common source of medicines for rural people and urban population, respectively.

KEY WORDS: Rural; Urban, Self-treatment; Practice of self-treatment; Attitude of self-treatment

INTRODUCTION

Self-medication is an age-old phenomenon that is practiced primarily by people for the treatment of their illness. According to the World Health Organization (WHO), self-medication is the main component of self-care, based on an individual's selection and use of allopathic drugs to

treat their self-recognized symptoms. It mainly involves diagnosing one's own illnesses by oneself and seeking care without any medical consultation for it.^[1] Young generation have more positive attitude toward self-treatment, which is serious matter of concern.^[2] Due to restricted health facilities, high cost, and long waiting hours, people in developing countries tend to prefer self-treatment for minor ailments such as pain and headache.^[3] Globally, the prevalence of self-treatment ranges from 0.1% to 27% in Europe and in the USA, which is much lower than developing countries.^[4] In India, the reported prevalence of self-medication is very high, that is, about 79%.^[4] Self-medication is a cause of concern, because it could lead to specific health issues. Self-treatment not only cause delay in actual treatment but also may further lead to a financial burden on the health system as

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well.^[3] In some extreme situations, it may lead to various drug interactions, which could be fatal. In self-medication practice, use of antibiotics can cause adverse reaction and in extreme cases leads to serious drug resistance.^[5,6] There is other side of self-medication also. In some situations, it can be a boon for the management of minor ailments in hilly and tribal areas where health services are not accessible due to geographical variation. As per the WHO, there are guidelines for few over-the-counter (OTC) drugs which can be purchased without a prescription.^[7] Hence, this study was planned to evaluate the differences in practice and attitude for self-treatment in rural and urban population of Uttarakhand.

MATERIALS AND METHODS

The study was a cross-sectional, survey-based comparative study conducted in Dehradun district, between July 2019 and December 2019 after taking approval from ethical approval from the Institutional Ethics Committee (IEC/IM/103/RC46/2014). The study population included participants from rural and urban areas of district Dehradun, Uttarakhand, who gave a history of self-treatment. Inclusion criteria were all the participants aged 20 years and above, who were willing to participate in the study, providing written consent and who provided a history of self-treatment within the past 6 months. People who were mental or physical challenged, suffering from serious illness and persons who were not permanent resident of study area were excluded from the study.

Since Dehradun district has 20 clusters, 100×5 cluster sampling technique for collecting the data from the study participants was used. Simple random sampling techniques (by lottery method) were used to select five rural and urban clusters and 100 houses were selected consecutively from the decided direction. One individual, from each of the 100 selected houses, fulfilling inclusion criteria were selected in the study. If any individual from a selected house was not fulfilling the criteria, then next new house was selected, until our inclusion criteria were met. A total of 500 study participants each from rural as well as urban areas were interviewed from each cluster. After obtaining the written informed consent, data were collected using structured questionnaires. The questionnaire has questions for capturing demographic details and 21 questions assessing practice of self-medication and 12 items with Likert scale for attitude. The items with Likert scale were assigned the score from 1 to 3.

Pearson's test-retest reliability was calculated for practice questionnaire and attitude Likert scale, and researchers found good reliability (practice $r=0.85$ and attitude $r=0.90$). Data were entered and analyzed using SPSS version 24. Descriptive statistics such as frequency, percentage, and ranking were calculated. Inferential statistics such as Chi-square test and unpaired *t*-test were calculated to find difference in practice and attitude of rural and urban people toward self-treatment.

RESULTS

The majority of participants were 30–39 years age group from rural (55%) as well as urban (54%) areas. Majority were male (57%) in rural areas, whereas in urban areas, majority were female (59%). The majority were married, having graduate level education and Hindu religion from rural (39%, 33%, and 67%) and urban (72%, 34%, and 82%) areas, respectively.

The majority of participants belongs to Class II group (40%) in rural areas whereas Class III (45%) in urban areas. Majority of participants were having monthly income from 10,000 to 20,000 and were vegetarian from rural (47% and 63%) and urban (50% and 70%) areas, respectively. Majority were non-smoker from rural and urban, that is, 63 % and 66%. Smokers followed a pattern of three bidis per day from rural and urban, that is, 21% and 25%. Most of them were non-alcoholic and doing walking exercise from rural (66% and 51%) and urban (70% and 50%). Most of them were not doing any yoga from rural (66%) and urban (51%) areas. The characteristics of both rural and urban populations were heterogeneous in nature and were comparable statistically.

The mean \pm S.D. number of times self-medication was done by the rural population which was 1.05 ± 1.23 as compared to urban population where the incidence was 0.68 ± 1.06 . This difference in use of self-medication was statistically significant.

Table 1 compares the practice for selection of self-medication among rural and urban people. The three most common reasons for self-treatment among rural people were convenience (72%) and cost saving (39.8%) followed by lack of trust in prescribing doctor (18.4%) whereas in urban people, cost saving (81%) followed by convenience (21%) and other reasons (11.4%) were common reasons. The three most common complaints for using self-treatment were fever and cough followed by aches and pains which were common in rural and urban peoples. Three common reasons for the selection of medicine for self-treatment among rural people were recommendation by community pharmacists and opinions of family members/friends followed by person own experience, whereas among urban people, the reasons for medicine selection were opinions of family members/friends, their personal experience followed by community pharmacists. Rural people mostly consider price, type followed by brand of medicine when purchasing medicine. Urban people consider brand of medicine, indication of use followed by price of medicine. Most common site for obtaining medicine for self-medication treatment in rural and urban areas was medical representatives and community pharmacies, respectively.

Table 2 shows that there was a significant difference (0.00*) in practice for usage of medicine for self-treatment among

Table 1: Comparison of rural and urban people practices for selection of self-treatment (N=500 in each group)

Options	Rural	Urban		
	f (%)	f (%)		
How many times did you treat yourself with medications in past one year?				
Mean±SD Rural =1.05±1.23; Urban= 0.68±1.06 P value-0.00				
1times	248 (50)	320 (64)		
2-5times	91 (18)	80 (16)		
6-10times	41 (08)	39 (7.8)		
>10times	120 (24)	61 (12.2)		
What were your reason for using self-medication treatment?				
	Rural frequency	Ranking	Urban frequency	Ranking
Cost saving	199	2 nd	405	1 st
Convenience	362	1 st	105	2 nd
Lack of trust in prescribing doctor	92	3 rd	15	4 th
Others	15	4 th	57	3 rd
For which of the following complain did you use medicine?				
Running Nose	111	8 th	96	9 th
Nasal congestion	212	5 th	196	4 th
Cough	248	2 nd	295	2 nd
Sore throat	201	6 th	191	5 th
Fever	268	1 st	318	1 st
Aches and pains	233	3 rd	294	3 rd
Vomiting	214	4 th	162	6 th
Diarrhea	147	7 th	114	7 th
Skin wounds	1	10 th	104	8 th
Others	5	9 th	2	10 th
Your selection of medicine for self-treatment was based on?				
	Rural frequency	Ranking	Urban frequency	Ranking
Recommendation by community pharmacists	313	1 st	95	3 rd
Opinions of family members/friends	192	2 nd	289	1 st
My own experience	161	3 rd	263	2 nd
Previous doctor's prescription	76	4 th	49	4 th
The advertisement	16	5 th	8	5 th
What did you considered when selecting medicine?				
Type of medicine	200	2 nd	145	4 th
Brand of medicine	178	3 rd	327	1 st
Price of medicine	237	1 st	164	3 rd
Indication of use	177	4 th	220	2 nd
Adverse reactions	50	5 th	53	5 th
Others	4	6 th	5	6 th
Where did you usually obtain medicine from for self-medication?				
Community pharmacies	258	2 nd	384	1 st
Medical representatives	281	1 st	199	2 nd
Leftover from previous prescription	120	3 rd	50	3 rd
Others	6	4 th	6	4 th

rural and urban people. The three most common ways of knowing medicine dose for self-treatment for rural as well as urban people were consulting a doctor, checking the package insert followed by consulting a pharmacist.

Table 3 shows that there was a significant difference in the practices for changing the dosage of medicine deliberately during self-treatment between rural and urban people. The three most common situations in which dosage of

medicines during the course of self-treatment was changed, for rural people were worsening conditions, followed by improving conditions and to reduce adverse reactions, but for urban people, the common situations were improving conditions, followed by worsening conditions and to reduce adverse reactions.

Table 4 compares the practices of switching of medicine during self-treatment among rural and urban population. The two most

common reasons for switch of first medicine during course of self-treatment among rural and urban people were common in both groups. The knowledge of availability of different brand names of medicine available in the market was significantly different in rural and urban group. The three most common reasons for stopping self-treatment medicine intake normally among rural people were first; a few days after recovery, second; few symptoms disappeared, and third; after medicine ran out. Among urban people, the reasons for stopping self-treatment medicine were first; after medicine ran out, second; a few days after recovery, and third; a few symptoms disappeared.

There was no significant difference (0.238) in practice for adverse reaction happening when taking medicine for self-treatment among rural and urban people although among rural people frequency of happening of adverse reaction is higher than urban, that is, 53% and 43%, respectively. Among rural and urban people, the first measure they used to follow was consulting a doctor. Among rural people, the second and third measures followed were switched to another medicine and consulting a pharmacy staff, respectively. Among urban people, the second measure followed during adverse reaction of self-treatment medicine were stopped taking medicine and third was consulting a pharmacy staff.

Figure 1 shows the most common agents used by the study population. In rural population, commonly used medicines were analgesic, antibiotics followed by antacids, whereas for

Table 2: Comparison of rural and urban people concerning practices for usage of medicine for self-treatment (N=500 in each group)

Options	Rural	Urban
	f (%)	f (%)
Did you ever check the instruction which comes with package insert of medicine for self-treatment? (Mean±S.D.) Rural=1.87±0.557; Urban=1.62±0.555 P value -0.00*		
Yes, always	112 (22)	205 (41)
Yes, sometimes	334 (67)	272 (54)
Never	54 (11)	23 (5)
How much did you understand that instructions? (Mean±S.D.) Rural =1.79±0.597; Urban=1.53±0.545		
Fully understand	146 (29)	239 (47)
Partly understand	295 (59)	238 (47)
Did not understand at all	59 (12)	23 (6)

Table 3: Comparison of rural and urban people concerning practices of medicine dose for self-treatment (N=500 in each group)

Options	Rural frequency	Ranking	Urban frequency	Ranking
How did you know the dose of medicines?				
Checking the package insert	135	2 nd	227	2 nd
Consulting a doctor	318	1 st	358	1 st
Consulting a pharmacist	132	3 rd	117	3 rd
Consulting family members/ friends	131	4 th	111	4 th
Newspaper, magazines, books or TV programs	52	7 th	27	7 th
Internet	54	6 th	39	5 th
Previous experience with treatment	63	5 th	33	6 th
Guessing the dosage by myself	10	8 th	7	8 th
Did you change dosage of medicine deliberately during course of self-treatment? Mean ± S.D. R= 2.01±0.536; U=1.74±0.614 Pvalue-0.00*				
	Rural f (%)	Urban f (%)		
Yes, always	68 (13)	172 (35)		
Yes, sometimes	350 (70)	278 (55)		
Never	82 (17)	50 (10)		
Why did you change dosage of medicines during the course of self-treatment?				
Improving conditions	179	2 nd	244	1 st
Worsening conditions	256	1 st	194	2 nd
To reduce adverse reactions	161	3 rd	157	3 rd
Drug insufficient for complete treatment	49	4 th	44	4 th
Others	4	5 th	5	5 th

Table 4: Comparison of rural and urban people concerning practices of switching of medicine during self-treatment (N=500 in each group)

Options	Rural f (%)	Urban f (%)		
Did you switch medicine during course self-treatment? Mean±S.D. R= 2.07±0.531;U=1.75±0.573 Pvalue-0.00*				
Yes, always	50 (10)	155 (31)		
Yes, sometimes	362 (72)	303 (62)		
Never	88 (18)	42 (07)		
	Rural	Ranking	Urban	Ranking
Why did you switch medicine during course of self-treatment?				
The former medicine did not work	159	2 nd	184	2 nd
The former medicine completed	235	1 st	206	1 st
The latter one was cheaper	152	3 rd	110	4 th
To reduce adverse reactions	130	4 th	158	3 rd
Others	7	5 th	5	5 th
	Rural f (%)	Urban f (%)		
How many different medicine did you take maximally during a single illness? Mean±S.D. R= 0.66±0.674;U=0.678±0.766 Pvalue-0.815				
No medicine	215 (43)	227 (46)		
1 medicine	242 (48)	225 (45)		
2 medicine	37 (8)	36 (7)		
3 medicine	3 (0.5)	8 (1)		
4 medicine	3 (0.5)	2 (0.5)		
5 medicine	0 (0.0)	2 (0.5)		
Have you ever found out that you had taken the some medicine with different names at the same time? Mean±S.D. R= 1.43±1.049;U=1.32±0.469 Pvalue-0.04*				
Yes	215 (43)	334 (67)		
No	285 (57)	166 (33)		
	Rural frequency	Ranking	Urban frequency	Ranking
When did you normally stop taking self-medicine treatment?				
After a few days regardless of the outcome	118	4 th	144	4 th
A few symptoms disappeared	214	2 nd	154	3 rd
A few days after recovery	256	1 st	196	2 nd
After medicine ran out	148	3 rd	223	1 st
At the completion of course	50	5 th	55	5 th
After consulting a doctor/ pharmacist	20	6 th	35	6 th
Others	05	7 th	02	7 th

urban people, commonly used medicine were analgesic and antacids followed antibiotics.

Table 5 compares the overall attitude of rural and urban people for use of medicine for self-treatment. There is a significant difference in the attitude of rural and urban participants.

Majority of rural people showed a neutral attitude (55%) followed by favorable (36%) and unfavorable attitude (9.1%) for use of medicine for self-treatment. In comparison, urban people showed favorable attitude (44%) followed by neutral (43.5%) and unfavorable attitude (11.5%) for self-medication.

DISCUSSION

The study conducted in rural and urban areas revealed that majority participants were male and female, respectively, and most common age group was 30–39 years in both areas. Majority participants were married, educated up to graduate level and belongs to Hindu religion among both rural and urban setting. The three most imperative reasons for rural self-treatment were convenience; cost savings followed by lack of confidence in prescribing doctor, whereas cost savings, convenience, and other factors are considered in urban population. Fever and cough followed by pain were

Table 5: Comparison of rural and urban people attitude for self-treatment (N=500 in each group)

Items		Rural f (%)	Urban f (%)	Mean±SD	P value
Self-medication is an acceptable practice.	D	24 (4)	6 (1)	R= 2.85±0.468	0.004*
	N	24 (4)	26 (5)	U= 2.92±0.295	
	A	452 (92)	468 (94)		
You can treat common disease with medicines successful by yourself.	D	35 (6)	23 (5)	R= 2.57±0.598	0.124
	N	153 (31)	137 (27)	U=2.63±0.569	
	A	312 (63)	340 (68)		
Buying medicine without prescription/ old prescription is a better option.	D	225 (45)	235 (47)	R= 1.90±0.874	0.629
	N	111 (22)	99 (20)	U= 1.87±0.885	
	A	164 (33)	166 (33)		
Self-medication could interfere with your natural healing.	D	88 (18)	136 (26)	R= 2.26±0.698	0.000*
	N	213 (42)	222 (45)	U= 2.03±0.740	
	A	199 (40)	142 (29)		
Self-medication continuous use may loose effectiveness.	D	80 (18)	136 (28)	R= 2.27±0.688	0.000*
	N	220 (42)	186 (36)	U= 2.09±0.783	
	A	200 (40)	178 (36)		
Self-medication continuous use may cause dependency or addiction.	D	83 (14)	48 (9)	R= 2.51±0.717	0.002*
	N	104 (20)	90 (18)	U= 2.66± 0.734	
	A	313 (66)	362 (73)		
I consume medication according to recommended dose earlier prescribed.	D	63 (12)	41 (8)	R= 2.65±1.548	0.937
	N	104 (20)	96 (19)	U= 2.66±0.608	
	A	333 (68)	363 (73)		
I consume medicine according to frequency recommended earlier prescribed.	D	58 (11)	61 (12)	R= 2.57±0.664	0.313
	N	113 (23)	81 (16)	U= 2.61±0.675	
	A	329 (66)	358 (72)		
I purchased medicine at the onset of manifestation.	D	64 (12)	48 (9)	R= 2.58±0.678	0.002*
	N	98 (20)	70 (14)	U= 2.70± 0.597	
	A	338 (68)	382 (77)		
I follow instruction as per label or from others.	D	33 (7)	23 (4)	R= 2.62±0.577	0.013*
	N	138 (27)	110 (22)	U= 2.70±0.525	
	A	329 (66)	367 (74)		
I got desired relief from self-medicine.	D	60 (14)	44 (8)	R= 2.44±0.683	0.203
	N	165 (32)	169 (34)	U= 2.50±0.639	
	A	275 (54)	287 (58)		
I got adverse reaction.	D	229 (46)	221 (45)	R= 1.69±0.701	0.399
	N	205 (41)	199 (40)	U= 1.73±0.723	
	A	66 (13)	80 (15)		
		Total	Rural	28.26±4.349	0.05*
			Urban	27.73±3.454	

R= Rural, U= Urban, D= Disagree, N= Neutral, A= Agree, *Significant value at 0.05 level

the three most common symptoms in both rural and urban communities for self-treatment. Medical representatives and community pharmacies, respectively, were the most common source for obtaining medicine for self-medication treatment in rural and urban areas.

The study from Western India reported that male participants were more involved and common age group was 30–39 years^[8]

due to male dominant society, perhaps makes them more prone to self-treatment. Another study also showed similar trend of males participants from (61.5% and 67.0%) in rural and urban areas and the most common age group presented was 20–39 years (65.0% and 69.5%), respectively.^[9] In contrast, the study performed on the Chennai population showed more active participation of females compared to males.^[10] Our study found dissimilarity in male and

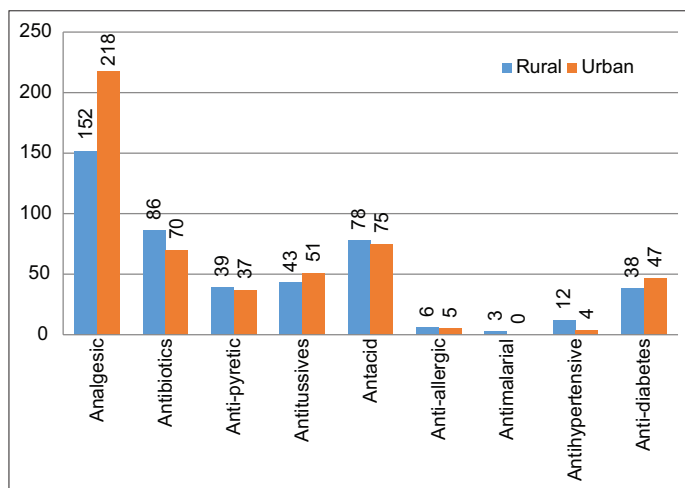


Figure 1: Commonly used medicine among rural and urban people

female distribution which might be a due to the variation in Uttarakhand geographical regions. Statistically significant difference in practice of rural and urban people for certain medication with different names was found to be available simultaneously in market.

On similar line of evidences, other researchers where the proportion of married participants were urban and rural areas (77%, 76%).^[9] However, differences in educational status were noticed, as studies showed that people were educated up to middle grade of education (22.0%, 27.5%) in urban and rural areas.^[9] Another study reported that subjects 33.9% had passed middle school education only.^[11] These differences are due to disparity in literacy levels between different states and socioeconomic class gap.

Another study findings were contrast most common reason for self-treatment as prior knowledge of illness and treatment, previous successful self-medication, many protocols at the hospital, to save time, to save money, urgency, and impoliteness of health-care practitioners.^[12] Another study also showed that most common symptoms for self-treatment of our study were in concurrence with similar study that reported pain, influenza/common cold, and allergy as common symptoms for self-treatment.^[13,14] A study reported that 40% participants took medicine from pharmacy professionals as a main source for self-medication drugs and 19% took advice from neighbors, friends, or relatives.^[15,16] On the other hand, in a clinical study, previous doctor's prescription was stated as source to get medication for self-treatment.^[17]

New findings of our study were we studied that most common ways of knowing medicine dose for self-treatment for rural as well as urban people were consulting a doctor (followed by checking the package insert^[18] and consulting a pharmacist). Another new finding of this study was significant difference in practice of medicine switching in rural and urban people. Common reasons for both areas people for switched their medicine were 1st completion of the former medicine and

2nd former medicine did not work. There was no significant difference between rural and urban people in the use of different medicines during a single illness.

Reasons for stopping intake of self-treatment medicines for rural people were first, a few days after recovery; second, few symptoms disappeared; and third, after medication had run out; whereas urban people reasons were first, after medication ran out; second, a few days after recovery; and third a few symptoms vanished.

The medicines commonly used in our study were analgesic, antibiotics, and antacids. Another study also reported commonly drug used was antipyretics (60%), antimicrobials (47%), and analgesic (46%), antihistaminic (36%).^[19] Another unique finding of this study was significant differences in rural and urban people's attitudes which were also found. Most rural people displayed a neutral attitude toward the use of medication for self-treatment in which urban people demonstrated a favorable attitude that may be harmful to their health. This can be of concern as this population is more prone to health hazard due to self-medications.

The main strength of this study was we included attitude as well as practice of both rural and urban people for self-medication, which was again compared to highlight main difference in both areas people. It also guides our policy-makers to plan separately health policy for both areas people. No single rule can be applicable to all in policy planning in health system. The main limitation of this study was as data were collected during day time data so majority participants were female only.

CONCLUSION

Self-medication is a very important health problem in Uttarakhand, as this state is mixed with hilly and plane areas where due to poor geography, the health services are limited. Since subjects who are in favor of self-medication are similar in rural and urban areas, a self-medication test is required for health education to the rural and urban population to treat minor ailments. Pharmacy legislation can be one major government move to restrict self-medication activities in Uttarakhand rural and urban population. Public concern about drug safety needs to be increased. Community awareness, protection, and efficacy of OTC drugs need to be maintained so that they remain effective even after their misuse. Quick availability of OTC medications is a major factor responsible for the excessive use of medicines in self-medication, leading to eventual health consequences such as antimicrobial resistance, increased morbidity load, and economic loss. There is a need for concerned authorities to make current laws about OTC drugs more stringent for their legitimate use. A robust pharmacovigilance system is also required, and any adverse effects must be reported to the patient, pharmacist, and physician. The need for encouraging

safe use of drugs in patients is not only important for health and medical treatment of patients and the society, but it also has financial implications. The health-care policy-makers and administrators should not ignore this important aspect affecting health-care system.

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REFERENCES

- World Health Organization. The Role of the Pharmacist in Self-Care and Self-Medication: Report of the 4th WHO Consultative Group on the Role of the Pharmacist. The Hague, Netherlands: World Health Organization; 1998. p. 13-5.
- Susheela F, Goruntla N, Bhupalam PK, Veerabhadrapa KV, Sahithi B, Ishrar SM. Assessment of knowledge, attitude, and practice toward responsible self-medication among students of pharmacy colleges located in Anantapur district, Andhra Pradesh, India. *J Educ Health Promot* 2018;7:96.
- Sridhar SB, Shariff A, Dallah L, Anas D, Ayman M, Rao PG. Assessment of nature, reasons, and consequences of self-medication practice among general population of Ras Al-Khaimah, UAE. *Int J Appl Basic Med Res* 2018;8:3-8.
- Limaye D, Limaye V, Fortwengel G, Krause G. Self-medication practices in urban and rural areas of Western India: A cross sectional study. *Int J Community Med Public Health* 2018;5:2672-85.
- Abay SM, Amelo W. Assessment of self-medication practices among medical, pharmacy, and health science students in Gondar University, Ethiopia. *J Young Pharm* 2010;2:306-10.
- Selvaraj K, Kumar SG, Ramalingam A. Prevalence of self-medication practices and its associated factors in Urban Puducherry, India. *Perspect Clin Res* 2014;5:32-6.
- Wijesinghe PR, Jayakody RL, de A Seneviratne R. Prevalence and predictors of self-medication in a selected urban and rural district of Sri Lanka. *WHO South East Asia J Public Health* 2012;1:28-41.
- Gadekar RD, Gattani PL, Dhande VS. A study of self-medication among the adult people of the Nanded city, Western India. *Int J Community Med Public Health* 2017;4:3814-8.
- Singh N, Singh NP, Jain PK, Singh V, Chaurasiya S, Verma R, *et al.* Comparative study to determine self-medication practice and pattern in urban and rural areas of Etawah district. *Int J Community Med Public Health* 2020;7:216-23.
- Christina M, Paul P, Swapna S, Preethi S, Kumar K, Dharshini PU. A cross sectional study on the prevalence of self-medication in a Chennai based population, Tamil Nadu, India. *Int J Community Med Public Health* 2017;4:418-23.
- Dutta R, Raja D, Anuradha R, Dcruze L, Jain T, Sivaprakasam P. Self-medication practices versus health of the community. *Int J Community Med Public Health* 2017;4:2757-61.
- Idoko CA, Omotowo BI, Ekwueme OE, Chidolue I, Ezeoke U, Ndu AC, *et al.* Prevalence and pattern of self-medication among medical students in a Nigerian University. *Int J Med Health Dev* 2018;23:189.
- Makeen HA, Albarraq AA, Banji OJ, Taymour S, Meraya A, Alqhatani S, *et al.* Knowledge, attitudes, and practices toward self-medication in a rural population in South-Western Saudi Arabia. *Saudi J Health Sci* 2019;8:54-9.
- Keshari SS, Kesarwani P, Mishra M. Prevalence and pattern of self-medication practices in Rural Area of Barabanki. *Indian J Clin Pract* 2014;25:636-9.
- Mamo S, Ayele Y, Dechasa M. Self-medication practices among community of Harar city and its surroundings, Eastern Ethiopia. *J Pharm* 2018;2018:1-6.
- Shafie M, Eyasu M, Muzeyin K, Worku Y, Martin-Aragon S. Prevalence and determinants of self-medication practice among selected households in Addis Ababa community. *PLoS One* 2018;13:e0194122.
- Kaushal J, Gupta MC, Jindal P, Verma S. Self-medication patterns and drug use behavior in housewives belonging to the middle income group in a city in Northern India. *Indian J Community Med* 2012;37:16-9.
- Agrawal NK, Kothari N, Gupta U, Verma SK, Pandey S. A cross-sectional evaluation of knowledge, attitude, and utilization of complementary and alternative medicine among medical students of North India. *Natl J Physiol Pharm Pharmacol* 2019;9:893-8.
- Bagewadi HG, Deodurg PM, Patil BV, Zahid SH. Perceptions and practices of self-medication among undergraduate medical students at Gulbarga institute of medical sciences, Kalaburagi, India. *Int J Basic Clin Pharmacol* 2018;7:63-7.

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