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Research Article

COMPARATIVE ASSESSMENT OF PREVALENCE, PERCEPTION, AND FACTORS ASSOCIATED WITH SELF-MEDICATION AMONG THE ADULT POPULATION

Aafrin AKBAR [1*] ***Shalini ARUMUGAM*** [2] ***Vinodhini BALAMURUGAN*** [3]

[1]Post Graduate, Department of Community Medicine, ACS Medical College, Chennai, India.
[2]Department of Community Medicine, ACS Medical College, Chennai, India
[3]Department of Community Medicine, ACS Medical College, Chennai, India
[*]**Corresponding Author:** aafrin.lubna@gmail.com

Abstract: *The primary objective of this study was to estimate the prevalence and factors associated with self-medication in rural and urban populations. A cross-sectional study was carried out in the urban and rural field practice areas of ACS Medical College, located at (Nerkundrum and Nayapakkam respectively) A pre-tested questionnaire was utilized to obtain data on socio-demographic characteristics and self-medication practices within the past three months. Among 270 respondents, 75.6% (102/135) of the rural population and 52.6% (71/135) of the urban population were reported for self-medication practice within the past three months. In the rural population, 43.2% of participants' reason for self-medication was cost saving & convenience, while in the rural population, 45.1% of participants chose convenience and cost saving and convenience. Community pharmacies were the commonplace of procurement of Antipyretic, Analgesic & NSAID drugs for Aches & Pain (Pain) in both populations. Knowledge about dosage, side effects, and safety instructions of the drugs taken for self-medication was poor in both populations. The prevalence of self-medication was found 23% greater in the rural population than in the urban population. Self-medication was strongly associated with factors like the age and income of the participants. Population education on the risks associated with self-medication and stringent regulations should be implemented to restrict the distribution of medications without a legitimate prescription.*

Keywords*: Factors, Prevalence, Self-Medication, Rural Population, Urban Population*

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1. Introduction

Self-medication is defined as using any drug for a self-diagnosed disease without first consulting a doctor [1]. Appropriate self-medication not only allows people to heal minor illnesses on their own but it also saves time and money [2]. However, a large majority of individuals lack a thorough awareness of their personalities and participate in ineffective self-medication [3]. Despite being a subject of controversy, self-medication remains a global practice, with varying incidence rates across different countries [4]. According to some reports, the incidence of self-medication in Western countries is as low as three percent; however, in poor countries, the frequency ranges from twelve percent to ninety-five percent [5,6].

One of the most common age groups that engage in self-medication is the adult population around the world [7]. One contributing factor to the high rates of drug use and self-medication among the elderly is their increased susceptibility to various illnesses [8]. A significant portion of the population is afflicted with ailments such as cardiovascular disease, diabetes, and cancer. Furthermore, individuals in this age

range frequently face the likelihood of developing several chronic diseases, which can result in a higher reliance on pharmaceuticals [9,10]. Conversely, the way the human body responds to pharmaceuticals and how drugs affect the body might become more complex in older individuals due to age-related changes [10]. This issue requires significant attention and should be addressed accordingly [10-12].

The ease of access, limited information on potential adverse effects, inadequate regulation, and lack of guidelines regarding the usage of both prescription and non-prescription medications contribute to the practice of self-medication [13]. Unreasonably using drugs is a direct result of inappropriate self-medication. Nearly all medications have the potential to induce side effects, which can be attributed to both undisclosed active ingredients and drug interactions. This practice, especially with antimicrobials, has resulted in the emergence of drug resistance, which is a significant global concern [14].

There is a significant lack of information regarding the frequency and factors influencing self-medication among individuals living in both rural and urban areas. Therefore, the present study was undertaken to ascertain the prevalence, perception, and factors linked to self-medication throughout the community. The data collected from this study has the potential to inform programs and policies aimed at addressing the complex problem of self-medication in the region, as well as increasing community awareness.

2. Material and Methods

2.1. Study design and sampling

A cross-sectional study was conducted between June - August 2022 around the urban and rural field practice areas of ACS Medical College, *(Nerkundrum and Nayapakkam respectively*). The inclusion criteria were adults aged 18 years or above including pregnant and lactating women. The study was conducted on adults residing in the study area. Participants were selected by random sampling. Registered medical practitioners and the seriously ill were excluded. Participants provided their written informed permission, which was collected.

Ethical statement

The institutional ethical committee approved the study (A.C.S. Medical State Hospital, No.544/2022/IEC/ACSMCH).

2.2. Data collection

A pre-tested structured Questionnaire was used for the study. The questionnaire had separate sections to collect information on socio-demographic characteristics, Self-medication practice among the rural and urban populations, Complaints and medical interventions taken for self-medication, Sources of information regarding self-medication, and knowledge about the dosage of self-medication.

2.3. Sample size

The Sample size was calculated based on the prevalence of 78.6% with a 5% margin of error and 95% confidence level. Considering a non-response rate of 5%, i.e., 13, the total sample size was calculated to be 270, which in turn was divided into 135 each for urban and rural areas.

2.4. Data Analysis

The acquired data were encoded and inputted directly into the SPSS 25 data entry software after undergoing consistency checks and addressing missing values. The demographic features and other critical factors were analyzed using descriptive techniques, specifically frequencies, and percentages. A chi-squared test was conducted on the important categorical variables to ascertain any correlation with

self-medication. The statistical significance of the association was assessed using a 95% confidence interval and a $p < 0.05$.

3. Results

3.1. Socio-demographic characteristics of the participants

In total, 135 participants were recruited in each rural population, of them 42.2% male and 57.8% female, and 135 participants were recruited in the urban population, of them, 37.8% male and 62.2% female. The Mean age of the participants in the urban population was (46.23±13.62) higher than the rural population (42.43±14.78). The mean number of family members in the urban population (3.90±0.79) was higher than the rural population (3.82±0.78). The maximum respondents among the rural population were in the income range of 20.7% [100000-149999], 13.3% [150000-199999], and 11.9% [200000-249999] whereas a higher income status was observed in urban population with each of 14.1% respondents lying in the income category [100000-149999], [200000-249999] and [300000-349999]. In both the rural (40%) and urban (29.6%) group, a significant percentage of respondents did not disclose their income category.

The group differences through the educational status of the participants were evaluated and the results were presented in Table 1.

Table 1. Educational Factors of The Participants

Variables	**Yes**	**No**	**p**	**Statistics (χ^2)**
Education: Rural				
Illiterate	5	7	**0.000*** **	24.73
Primary school	5	8		
Middle school	28	5		
Higher secondary school	25	9		
Diploma	30	2		
Graduate	9	2		
Education: Urban				
Illiterate	4	5	0.990	0.725
Primary school	4	4		
Middle school	16	12		
Higher secondary school	14	15		
Diploma	17	15		
Graduate	14	12		

χ^2 : Fischer exact test; ***p<0.001

In the rural population, the maximum number of respondents were educated till middle school (24.4%) followed by 23.7% diploma holders and 17.8% higher secondary school. In comparison, 23.7% of urban respondents were diploma holders, followed by 20.7% of respondents with middle school education and 19.3% were graduates (Table 1).

The group differences through occupational factors of the participants were evaluated and the results were presented in Table 2.

Table 2. Occupational Factors of the Participants

Variables (Occupation)	Rural		Urban	
	Yes	**No**	**Yes**	**No**
Unemployed	3	6	0	0
Homemaker	19	7	24	17
Unskilled worker	9	3	3	5
Semiskilled worker	21	0	12	6
Skilled worker	19	0	7	7
Business	8	3	12	9
Clerk	17	0	10	12
Professional	0	1	2	0
Retired	1	4	1	3
Student	5	9	0	5
p	**0.000*** **		0.157	
Statistics (χ^2)	39.549		5.252	

χ^2 :Fischer exact test ; ***p<0.001

Amongst the rural population, 15.6% of respondents were semi-skilled, followed by 12.6% clerk and 9.6% skilled occupants, whereas in the urban population, the employed sections were 16.3% clerk, 15.6% professional, 13.3% semi-skilled. The unemployed group comprised 6.7% and 5.9% of the rural and urban study population, respectively (Table 2)**.**

3.2. Prevalence of self-medication

The prevalence of self-medication was around 23% higher in the rural population (75.6%) than in the urban population (52.6%) (Figure 1a). In the rural population, 57.8% of the females and 42.2% of males used self-medication, while in the rural population, it was 62.2% and 37.8%, respectively (Figure 1b). In both populations, self-medication was more common among people less than 60 years of age (Figure 1c).

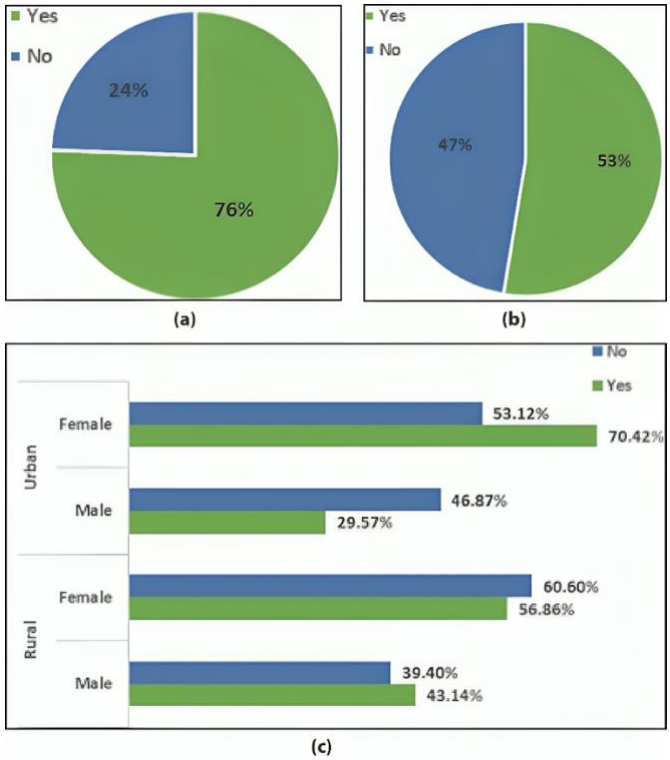

Figure 1. Prevalence of Self-Medication in Rural and Urban Population (a) Self-Medication in Rural Population (b) Self-Medication in Urban Population (c) Self-Medication by Gender

The practice of treating anyone else with self-medication was greater (33.8%) in the urban population than rural population. Among the reported answers for self-medication in last 3 months, there is a greater number (43.7%) of respondents treated once themselves in the rural population.

Group differences between rural and urban populations through self-medication practice were evaluated and the findings were presented in Table 3.

Table 3. Self-medication practice among the rural and urban population

Variables	**Rural**	**Urban**	**p**	**Statistics**
	N= 102(%)	**N=71(%)**		**(χ^2)**
Have you ever treated anyone else with self-medication?				
Yes	8 (7.8)	24 (33.8)	**0.000*** **	14.64
No	94 (92.2)	47 (66.2)	0.06	20.16
How many times did you treat yourself with self-medication in the past 3 months?				
Nil	38 (37.3)	8 (11.3)	**0.000*** **	6.655
Once	52 (50.9)	31 (43.7)	0.494	1.236
Twice	9 (8.9)	19 (26.7)	**0.003** **	8.369
Thrice	3 (2.9)	10 (14.1)	**0.008** **	7.369
Four times	0	2 (2.8)	0.09	0.361
Five times	0	1 (1.4)	0.231	0.123
What was (were) your reasons for self-medications				
Convenience	41 (40.3)	32 (45.1)	0.627	1.236
Convenience & Lack of trust in doctor	1 (0.9)	0	0.404	
Convenience & Others (specify)	1 (0.9)	0	0.404	
Cost saving	15 (14.7)	5 (7)	0.144	
Cost saving & Convenience	44 (43.2)	32 (45.1)	0.85	1.36
All Reasons	0	2 (2.8)	0.09	

χ^2 :Fischer exact test;**p<0.01; ***p<0.001

The most common reasons for self-medication among the rural population were cost-saving and convenience (43.2%), followed by convenience (40.3%), while convenience and cost-saving and convenience (45.1%) were both the common reason in the urban population (Table 3).

3.3. Complaints and medical interventions taken for self-medication

Among the reported complaints, Aches and Pain (Pain) were the most common in the rural population than the urban population. Both populations mostly used self-medication for Aches & Pain (Pain), with 87.5% participants in the rural and 64.7% participants in the urban sector. Aches, pain, and Fever (pain and fever) were the second cause for self-medication, with 7.9% respondents in rural and 14.1% respondents in the urban population with no significant difference (p>0.05). The tendency to self-medicate was significantly higher for Aches, pain, Fever, Gastric related and Flu-like illnesses in the urban population (Figure 2a).

Antipyretic, Analgesic, and NSAIDs were the most widely used drugs among participants in both populations with no significant difference (p>0.05). Nearly 46.5% of participants in rural areas and 45% of people in urban areas take Antipyretic, Analgesic, and NSAIDs on their own. On the other hand, the rate of Antipyretic, Analgesic & NSAID, and Antibiotic drugs usage was nearly triple in the urban areas (5.9%) compared to the rural areas (2.8%). Significantly different percentages of Antipyretic, Analgesic and NSAIDs, and Anti-Reflux drugs were consumed in the urban population (15.6%) than in the rural population (4.9%) (Figure 2b). Antipyretic, Analgesic and NSAIDs, and Antibiotic, Anti-Reflux drugs were five times higher in urban areas in comparison to rural areas. Self-medication of Antipyretic,

Analgesic and NSAIDs, Anti-Diarrheal, Anti-histamine, Anti-reflux, expectorant was only seen in the urban population (Figure 3 and 4).

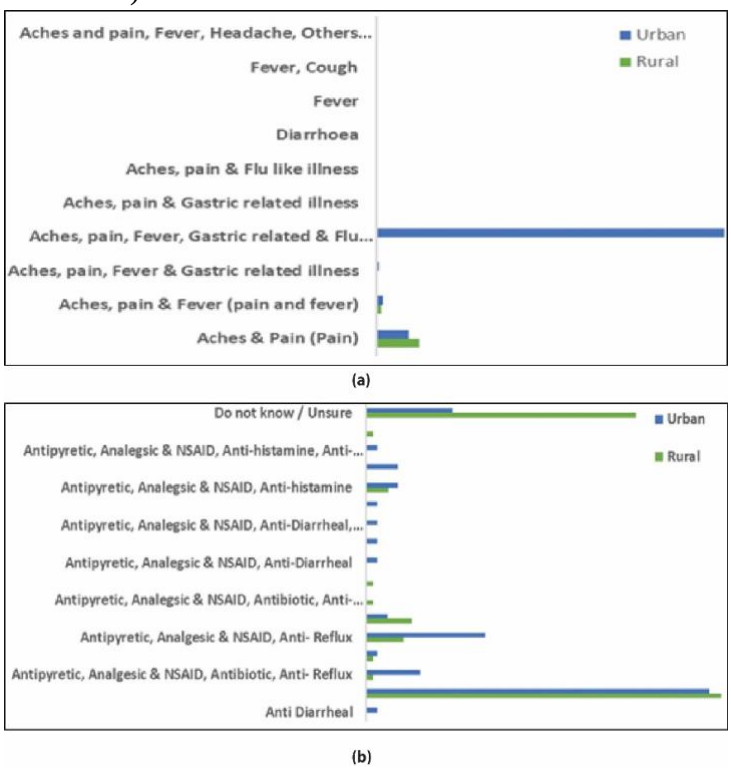

Figure 2. Complaints and medical intervention of self-medication practices (a) Complaints for self-medication (b) Drugs used for self-medication.

Allopathy was the most common branch of medicine considered by the population for self-medication. There was no significant difference ($p>0.05$) for allopathy in the rural population (63.8%) and urban population (74.6%). A greater level of consideration for the combination of other branches of medicine was seen with Allopathy with Homeopathy (9.8% & 9.9%), Allopathy with Siddha/ayurveda (15.7% & 5.6%) and Allopathy, Homeopathy and Siddha/ayurveda, all three together (9.8% & 9.9%) in rural and urban participants respectively with no significant difference (Figure 3 and 4).

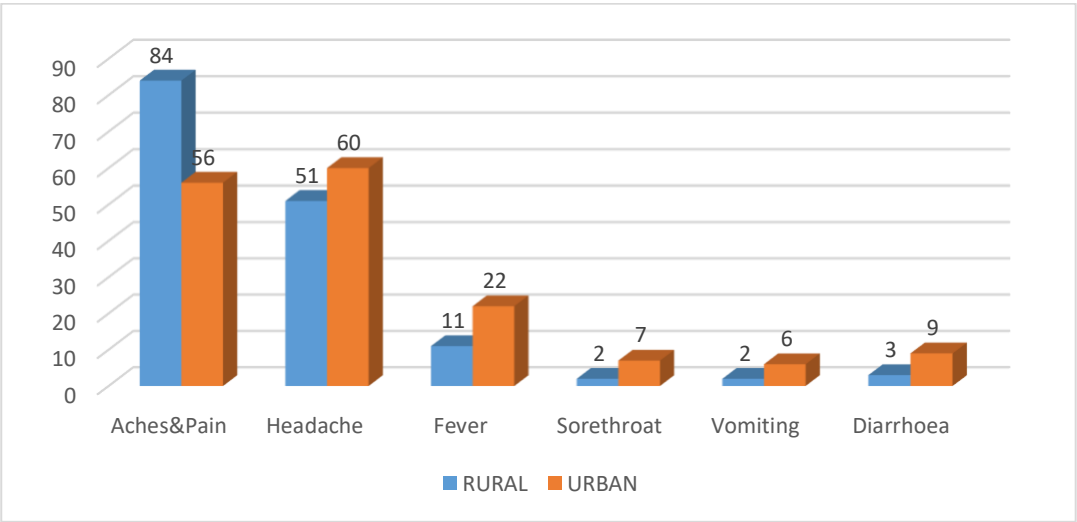

Figure 3. Complaints for using self-medication

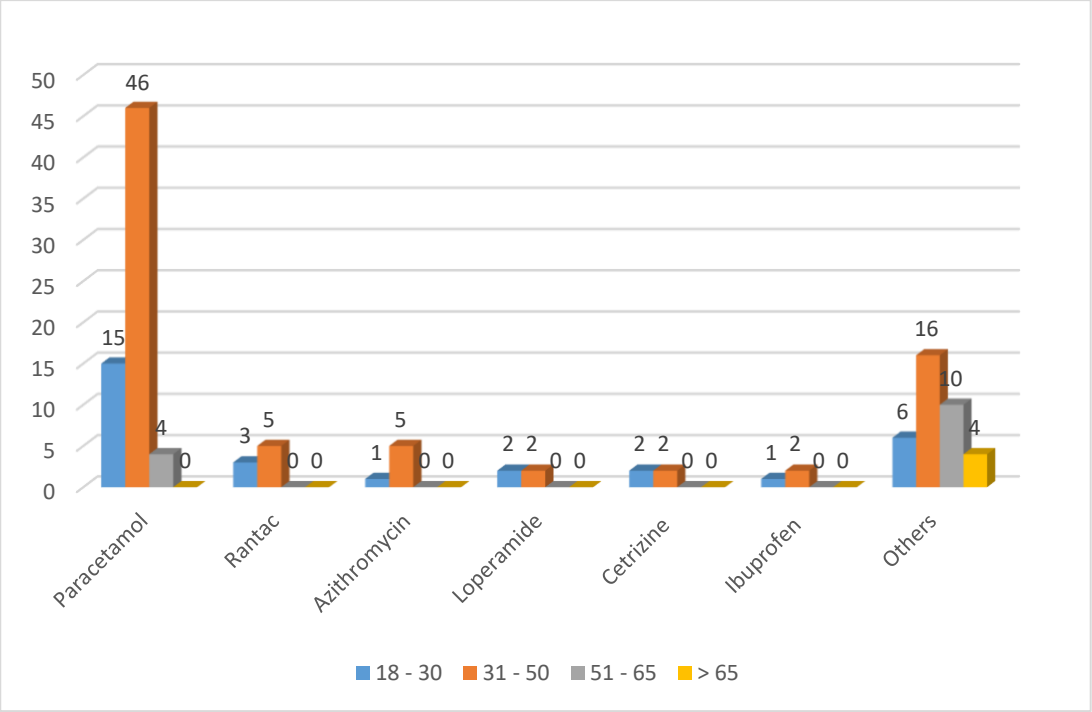

Figure 4. Rural – Medication

3.4. Source of information regarding self-medication

The common reason behind the selection of self-medications was the recommendation by community pharmacists among both populations, with a significantly greater percentage in the rural areas (52%) than in the urban areas (22.5%). Most participants in the rural areas considered their own experience (31%), followed by recommendations by community pharmacists (22.5%) than any other reason provided in the questionnaire. The opinion of family members was six times more considered behind the selection in the urban areas 8.5% than in rural areas 0.9%. Recommendations by community pharmacists and the opinion of family members were the second considered option in the rural population (15.8%), followed by my own experience and recommendation by community pharmacists (11.9%). Among the rural areas, a previous doctor's prescription was not an option in consideration for self-medication. Community pharmacies were commonplace to obtain medicines in both areas with no significant difference. Procurement of self-medication was least dependent on leftovers from the previous prescription among both populations (Table 3).

Table 3. Source of information regarding self-medication

Variables	Rural	Urban	P value	Statistics
	N= 102(%)	N=71(%)		(χ^2)
My own experience	6 (6)	22 (31)	**0.000*** **	16.29
Opinion of family members	1 (0.9)	6 (8.5)	**0.016***	5.77
Previous doctors' prescription	0	2 (2.9)	0.09	2.87
Recommendations by community pharmacists	53 (52)	16 (22.5)	**0.002****	9.08
My own experience, and opinion of family members	1 (0.9)	4 (5.6)	0.07	3.136
My own experience, previous doctors' prescription	1 (0.9)	1 (1.4)	0.796	0.066
My own experience, recommendations by community pharmacists	12 (11.9)	7 (9.8)	0.709	0.318
Recommendation by community pharmacists, previous doctors' prescription	1 (0.9)	1 (1.4)	0.796	0.666

Table 3. Continued.

Variables	Rural N= 102(%)	Urban N=71(%)	P value	Statistics (χ^2)
Recommendations by community pharmacists, opinions of family members	16 (15.8)	10 (14.1)	0.789	0.071
My own experience, the opinion of family members, previous doctors' prescription		2 (2.8)	0.193	
My own experience, recommendations by community pharmacists, previous doctors' prescription	2 (1.9)		0.449	
My own experience, recommendations by community pharmacists, opinions of family members,	6 (6)		0.19	
My own experience, recommendations by community pharmacists, opinion of family members, Previous doctors' prescription	1 (0.9)		0.593	
My own experience, recommendations by community pharmacists, opinions of family members, recommendations of citizens	2 (1.9)		0.449	
Where do you usually obtain self-medication?				
Community pharmacies	100 (98.2)	70 (98.6)	0.971	0.369
Left over from the previous prescription	1 (.9)	1 (1.4)	0.796	0.698
Other	1 (.9)	0	0.404	0.358
Did you ever check the instructions that comes with the package of medications?				
Never	99 (97.1)	62 (87.3)	0.60	0.368
Yes, sometimes	3 (2.9)	9 (12.7)	**0.016***	1.399
How much did you understand the instructions?				
Partly understood	3 (2.9)	6 (8.4)	0.12	0.688
Did not understand at all	1 (0.9)	46 (64.8)	**0.000*****	12.369
Fully understood	0	1 (1.5)	0.231	0.367
Response not given	98 (96.2)	18 (25.3)	**0.000*****	13.645

χ^2 :Fischer exact test;*p<0.05; **p<0.01; ***p<0.001

3.5. Knowledge about the dosage of self-medication

Among the reported participants, a higher tendency was observed in both populations to check the instructions that come with the package of medications. A major chunk of the urban population, 64.8% did not understand at all the instructions for medicines, while 96.2% of the rural population had not responded to this question. The knowledge about the dosage of medicines was obtained in the rural population by consulting pharmacists (75.5%), while in the urban population, it was gathered from their own previous experience (39.4%). The dosage of self-medications during treatment did not change for both populations. A small urban population of 11.3% only changed the dosage of self-medication for worsening conditions. The maximum number of drugs taken during a single illness was once, with 79.4% and 57.8% in the rural and the urban population respectively. In the urban areas, 35.2% of the population were taking twice drugs for a single illness. A 6 % higher number of participants in urban areas were taking thrice drugs for a single illness. No knowledge of counterfeit self-medication was observed in both populations. In the rural population, a greater number of participants (58.8%) had taken the same drug with different names, while even greater, 81.7% urban population had never taken such drugs. Both populations normally stop taking those drugs when the symptoms disappear. No adverse reactions were reported by the populations during self-medication. Self-medication for self-care was not considered an acceptable practice by the rural population while the urban population considered it as an

acceptable practice. The rural population of 58.8% thought common disease could not be successfully treated by self-medication while the urban population was not sure about it (Table 4).

Table 4. Knowledge of the participants about the dosage of self-medication

Variables	Rural	Urban	p	Statistics
	N= 102(%)	N=71(%)		(χ^2)
How did you know the dosage of self-medication?				
By consulting doctor	0	1 (1.4)	0.231	0.869
By consulting a pharmacist	77 (75.5)	20 (28.2)	**0.000*** **	2.399
By consulting family members/friends	3 (2.9)	7 (9.8)	0.061	1.698
From my previous experience	13 (12.8)	28 (39.4)	**0.034***	3.698
Response not given	9 (8.8)	15 (21.2)	**0.032***	
Did you ever change the dosage of self-medications during treatment?				
Yes, sometimes	1 (0.9)	8 (11.3)	**0.003****	5.365
Never	100 (98.2)	61 (85.9)	0.416	0.369
Response not given	1 (0.9)	2 (2.8)	0.367	0.968
Why did you change the dosage of self-medications during self-treatment (more than one applicable)				
Worsening condition	1 (0.9)	8 (11.3)	**0.003****	3.698
Response not given	101 (99.1)	62 (87.3)	0.435	0.869
Other	0	1 (1.4)	0.231	0.369
How many different drugs did you take maximum during a single illness?				
Single	81 (79.4)	41 (57.8)	0.095	1.369
Twice	20 (19.7)	25 (35.2)	**0.047***	1.969
Thrice	1 (0.9)	5 (7)	0.035*	1.969
Are you concerned that you might have taken counterfeit self-medication?				
Yes Somewhat	3 (2.9)	6 (8.5)	0.118	0.369
No	99 (97.1)	65 (91.5)	0.714	0.389
Have you ever found out that you had taken the same drugs with different names at the same tim				
Yes	60 (58.8)	13 (18.3)	**0.000*** **	6.369
No	42 (41.2)	58 (81.7)	**0.003****	5.369
When did you normally stop taking those drugs?				
After symptoms disappear	99 (97.1)	64 (90.1)	0.645	0.726
After drugs ran out	3 (2.9)	1 (1.4)	0.514	0.369
Response not given	0	6 (8.5)	**0.003****	2.369
Have you ever had any adverse reactions during self-medication?				
Yes	7 (6.9)	5 (7.1)	0.965	0.987
No	95 (93.1)	63 (88.7)	0.765	1.369
Response not given	3 (2.9)	3 (4.2)	**0.037***	2.369
What do you think about self-medication for self-care?				
Good Practice	0	6 (8.5)	**0.003****	3.698
Acceptable practice	29 (28.4)	46 (64.8)	**0.023***	3.345
Not acceptable practice	73 (71.6)	19 (26.7)	**0.000*** **	2.963
Do you think common diseases are successfully treated by yourself?				
Yes, I do	4 (3.9)	8 (11.3)	0.071	1.369
Not sure	38 (37.3)	56 (78.9)	**0.015***	2.345
No, I can not	60 (58.8)	7 (9.8)	**0.000*** **	3.658

χ^2 :Fischer exact test;*p<0.05; **p<0.01; ***p<0.001

3.6. Factors affecting self-medication in rural and urban population

Age and income were found to be a significant factor affecting self-medication among the rural and the urban populations ($p<0.05$). Among different age groups, participants aged less than 45 and less than 75 groups were more likely to self-medicate in both populations, while only in urban population participants less than 60 were involved in self-medication. The gender of the participants was not a determinant of self-medication in both populations. In comparing both populations, the education profile did not affect the decision to self-medicate. However, in rural populations, participants having graduation, diploma, and primary education, as well as illiterate, were more likely to self-medicate. In the urban population, only students were involved in self-medication, but in the rural population, participants who were retired, semiskilled, skilled workers, and unemployed were involved. A number of family members had no significant effect on the practice of self-medication in both populations. The comparative effect of income of the participants was affecting self-medication in both populations. However, only participants from rural areas having income of 1 lakh to 2 lakh were likely to self-medicate.

4. Discussion

The prevalence of self-medication in the present study was higher in the rural population than in the urban population. A similar observation of high prevalence among the rural population was reported in previous studies [15,16]. The difference in prevalence between the two populations could be due to different socio-characteristics, variation of illnesses, health-seeking behaviour of the people, and considered recall period [17-22]. Among the reported reasons for self-medication, convenience, and cost-saving were the most common reasons in both populations for self-medication. In a country like India, self-medication is considered a low-cost treatment for those who cannot afford the cost of clinical services [23].

Aches and Pain (Pain) were the most reported causes, and diarrhoea, fever, and cough were the least reported causes for taking self-medication in both populations. A greater number of cases for Aches and Pain (Pain) (87.5%) was observed in the rural population. The reason might be the involvement of participants in strenuous and high energy-consuming work. These results are in accordance with the previously reported studies carried out in different areas affirming the cause of self-medication [24-29]. Antipyretic, Analgesic and NSAID were the common drugs (46.5%) used for self-medication in this study among both populations with no significant difference. Similar high use of these drugs for self-medication was reported in other studies [16,30]. Allopathic medicines were preferred for self-medication in rural as well as urban populations. These findings are similar to the results reported in several studies [31,32]. The combination of allopathic and ayurvedic medicines was more likely to be taken in rural populations while in rural populations, allopathic with homeopathic medicines were consumed under self-medication.

The most important source of information in our study was the recommendation by community pharmacists about 52% in rural areas. and around 31% of participants considered their own experience in the urban population. Community pharmacist was the second preferred choice among the urban population. Similarly, a higher prevalence of community pharmacists as a source of information was observed in previous studies [31-34]. The easy availability of drugs at Community pharmacies is another major reason for self-medication in rural and urban populations [31, 32]. Jawarkar et al. (2017) also documented easy access to drugs from community pharmacies also a major reason to self-medicate [32]. Consulting a pharmacist was majorly a major reason for dosage understanding of self-medication in rural populations more than in urban populations. The probability of taking the same drugs with different names was significantly higher in the rural population than in the urban population.

The knowledge of self-medication was better among rural people, which means that respondents thought it was not a good practice, while participants from urban areas thought it was an acceptable practice. However, both populations agreed that common diseases cannot be successfully treated by self-medication.

5. Conclusion

The prevalence of self-medication was found to be 23% greater in the rural population than in the urban population. Self-medication was strongly associated with factors like the age and income of the participants. Convenience and cost-saving were the major reasons for self-medication in both populations. In both populations, Antipyretic, Analgesic, and NSAID drugs were taken for the most common complaint of aches and pain to self-medicate. Allopathic drugs were consumed in both populations. However, allopathic with ayurvedic was preferred among the rural population, and allopathic with homeopathic was chosen by the urban population. The selection of self-medication was based on the recommendation of community pharmacists, and the easy availability of drugs across local pharmacies was the main reason behind the practice of self-medication. The majority of the participants did not have knowledge about the drugs consumed, dosage of drugs, and self-medication which should be a serious concern.

5.1. Limitation

Due to the cross-sectional survey design of the study, the reported information may be subject to a three-month recall bias. The participant's self-medication was based on their own understandings and assumptions. Using random sampling to select study subjects from the population may restrict the generalizability of the study findings beyond the study population. Two populations had different sample sizes because they were determined separately using local estimates.

Ethical statement:

The institutional ethical committee approved the study (A.C.S. Medical State Hospital, No.544/2022/IEC/ACSMCH).

Conflict of interest:

The author(s) confirmed that they have no potential conflicts of interest regarding the research, authorship, and/or publication of this article.

Authors' Contribution:

Study conception and design were carried out by A. A. and S. A. Data collection was conducted by A. A. The analysis and interpretation of results were performed by A. A., S.A., and V. B. The draft manuscript was prepared by A. A. All authors reviewed the results and approved the final version of the manuscript. The authors confirm sole responsibility for study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

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