Original Article

Perception Analysis Of The Use Of Over-The-Counter Medications Amid COVID-19: A Cross-Sectional Study

Anita Michael [1], Monisha Mohan *[2], Swarna Muthu Lakshman Thiyagarajan Jayanthi [3], Veeraraghavan Gunasekaran [4]

1. Final year MBBS, PSG Institute of Medical Sciences and Research, Coimbatore, Tamilnadu, India. anitamichael13@gmail.com
2. Department of Biochemistry, Saveetha Medical College and Hospital, Chennai, Tamilnadu, India. monishagayumgm1@gmail.com
3. Final year MBBS, Sri Venkateshwaraa Medical College Hospital and Research Centre, Puducherry, India. swarnamuthulakshmantj@gmail.com
4. Department of Radiodiagnosis, Saveetha Medical College and Hospital, Chennai, Tamilnadu, India. raghavan71287@gmail.com

***Corresponding author:**
Dr. M.Monisha, MBBS., MD Assistant Professor, Department of Biochemistry, Saveetha medical college and hospital, Thandalam, Chennai- 602105. monishagayumgm1@gmail.com
DOI: 10.47750/pnr.2023.14.02.198

Abstract

Introduction: Acquiring the highest attainable standard of health is one of the fundamental rights of every human. Provision of standard healthcare facilities is essential for the development of any nation. Although it is difficult for such provision of optimum healthcare facilities at public level. In that case, over the counter medications took over. In this study assessed the frequency of use of such medications with respect to the COVID-19 pandemic and analyzed population perception and awareness regarding the same. **Methods:** This is a Cross-sectional survey conducted among the general public, which included 328 individuals consented to participate. It was conducted through telephonic interviews and an online questionnaire which was circulated across Tamil Nadu and Puducherry. Our questionnaire included 4 sections (i) Demographic information (ii) over the counter medication practices with respect to pre-existing medical illness (iii) over the counter Medication practices prior to and during the pandemic (iv) knowledge and awareness assessment. Data was analyzed by SPSS software. **Results:** Our survey indicates that there is an increase in over-the-counter medication usage from 48.4% prior to COVID to 83.8% after COVID. Non-steroidal anti-inflammatory drugs (NSAIDs) are the most used over the counter drug. Among them, paracetamol was at the risk of abuse/ misuse. **Conclusion:** More than half of the over-the-counter drug users were not aware of the dosage and adverse reactions of the drug they take. With more individuals tending towards over-the-counter medication, the risk to adverse drug events and complications of undiagnosed diseases tends to be high.

KEYWORDS: Adverse drug reaction, COVID 19, Pandemic, Self-medication

INTRODUCTION

Over the Counter (OTC) medications as defined by the World Health Organization (WHO) in 2000, are described as medicinal products which do not require a medical prescription and are produced, distributed, and sold with a primary intention that they will be used by consumers on their own initiative and responsibility. However, while OTC is acceptable under WHO guidelines, it is emphasized that adequate control over its use is maintained prior to integrating it as a part of social behavioral practices.[1] This could be attributed to the use of OTC medications as a temporary alternative to professional healthcare services where it presents with increased risks of incorrect or incomplete diagnosis owing to its symptom-based management approaches. Individuals also tend to take them at doses beyond the recommended with an increasing possibility for drug abuse, adverse drug events and antimicrobial resistance.[2] Provision methods and consumption patterns generally vary according to the nation's healthcare system and governmental regulations on distribution and sale. In India, there have been no specific guidelines for licensing of OTC medications and those that do not come under the contents of prescription drugs, are generally sold as over the counter drugs.[3] Convenience and easy access to a variety of OTC medications at affordable costs, has motivated individuals to seek quick relief through self-medications over a medical consultation.[4] This is particularly prevalent in low and middle income nations such as India with pre-existing high unemployment rates, increased economic inequality and

inadequate/inaccessible healthcare. The COVID-19 pandemic has placed an additional stress on the nation in terms of financial strength and healthcare availability, thus aggravating the existing health crisis.[5] Thus, it is of utmost importance to evaluate the perception of individuals towards OTC medications, pattern of its use for pre-existing medical illness as well as in the setting of COVID-19 pandemic. With this we set up the study to investigate the general public's opinion on how the pandemic influenced them to opt for non-prescribed medications, sociodemographic influence, their knowledge and awareness assessment on OTC drug usage.

MATERIALS AND METHODS

Study Design: A cross-sectional multicentric study was conducted among the general population in Tamil Nadu and Puducherry following an ethical approval from the 'Institutional ethical committee'.

Sampling: Population cohort was identified through 'snowball sampling' method and the survey was conducted between July and August 2022 through google forms and telephonic interviews. An online questionnaire was devised, pretested, revised, and approved prior to circulation.

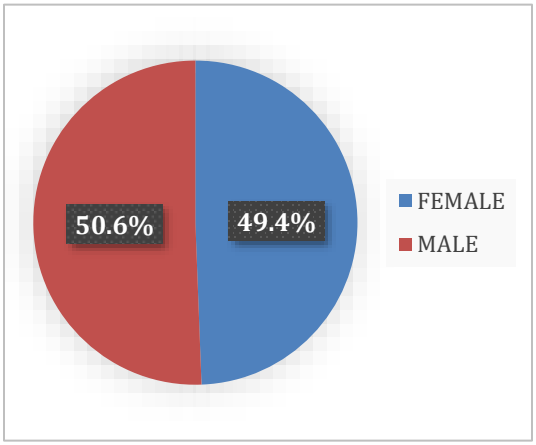
Inclusion and exclusion criteria: All participants above 18 years of age were included in the study. Individuals from varied educational and employment status were also interviewed. All medical graduates and professionals as well as medical students in the clinical years of their education were exempted from the study due to increased awareness of the medication characteristics and dosage, which may hamper with the study results. **Data collection:** The participating cohort consisted of 328 respondents who consented for the study. Telephonic interviews was conducted to increase participation among the elderly and those who are technologically backward. The questionnaire composed of 4 sections with an 'Informed consent' appended to the questionnaire. The first section collected the socio-demographic profile of the individual, the second section collected data on OTC medication practices with respect to pre-existing medical illness, the third section collected data on OTC Medication practices prior to and during the pandemic. The fourth section was focused on the knowledge and awareness assessment.

Statistical Analysis: Statistical analysis was performed using SPSS software. Descriptive data was expressed in frequencies, percentages, graphs and charts. Percentage of increase in OTC utility pre and post pandemic was calculated by subtracting final value with initial value and dividing it with starting value and multiplied by 100. Chi square test was performed to compare OTC use before the pandemic and during the pandemic with socio-demographic variables. p value less than 0.05 was considered statistically significant.

RESULTS

I. Population characteristics and socio-demographic profile

A total of 328 responses to the questionnaire were obtained. Among them 50.6% (n = 166) were males and 49.4% (n = 162) were females **(Figure 1).** 40.3% (n=132) of the study population lie in the age group of 18-65 years and 28% (n=92) above the age of 50 years. 56.7% of the participants come from an urban locality while 43.3% come from the rural areas **(Table I).**



"Figure 1: Gender Distribution of the Population"

"Table I: Socio-Demographic profile of the study Population"

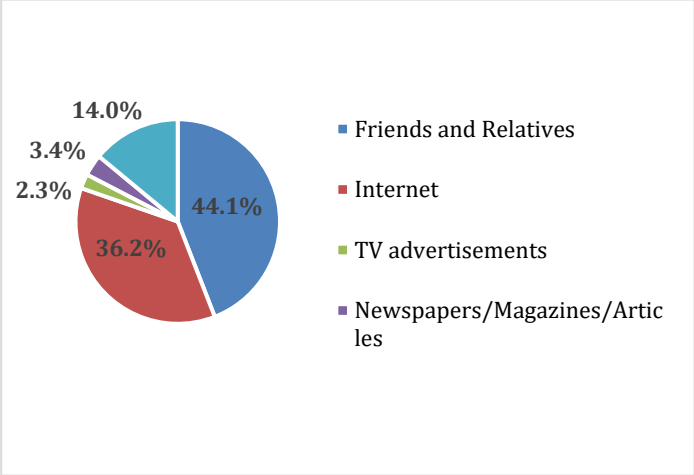
Socio-Demographic Variables	Frequency (n)	Percentage (%)
Educational qualification		
High School and higher secondary	86	26.3
Undergraduate	127	38.7
Postgraduate	115	35
Age group		
18-30	132	40.3
31-50	104	31.7
>50	92	28
Marital status		
Single	160	48.7
Married	168	51.2
Employment		
Unemployed / Retired	154	47.1
Self-Employed	7 5	22.8
Employed	99	30.1
Geographical Location		
Rural	142	43.3
Urban	186	56.7

II. Usage and source of Information for OTC Medications

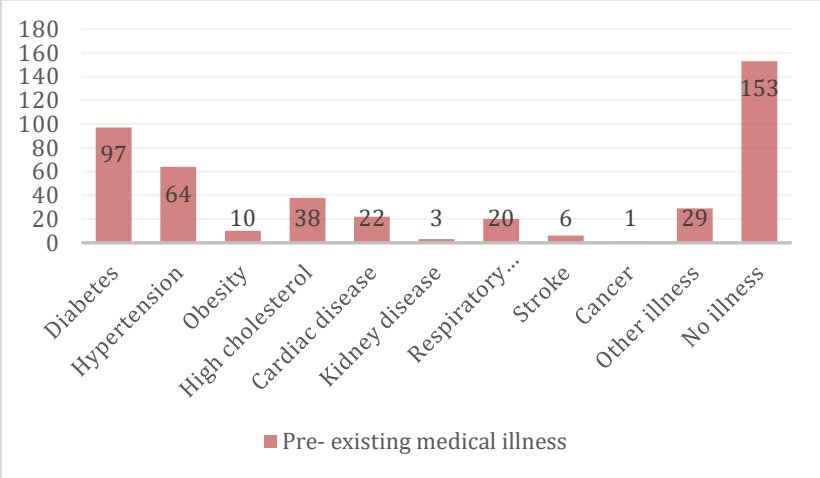
More than half of our study population (83.4%) use OTC medication. Recommendations from friends or relatives (44.1%) being the major source of information for usage of OTC drugs followed by the internet (36.2%) **(Figure 2).** When asked about the reasons for OTC usage, 54.6% (n=179) considered OTC drugs as 'time saving' to that of a medical consultation. 39% (n=128) considered it to be a money saving, while 32.3% (n=106) believe that it is not necessary to visit a doctor for minor health illnesses. 25.3% (n=83) believe some OTC drugs provide a faster relief to that of prescribed medications. Most of the respondents (55.8%, n=183) concluded that usage of OTC medication to be a result of prior experience/habit. Among the elderly and rural population of the sample, 'lack of medical support or hospitals nearby' (13.1%, n=43) and 'lack of assistance to guide me to the hospital' (9.45%, n=31) are significant reasons contributing to their OTC drug use.

III. OTC Medication Practices with respect to Pre-Existing Medical Illness

When asked about the pre- existing health condition, about 56.7% (n=186) of the sample cohort have medical diseases/conditions to which the participants use prescribed drugs as a management strategy. (**Figure 3)** indicates the distribution of medical conditions in the population. Individuals diagnosed with cancer, stroke, kidney/cardiac diseases and diabetes take only their prescribed medications. Only 47.4% of individuals with high cholesterol and only 67.2% of individuals with hypertension use prescribed medications **(Table II).** More than one third (37.5%) of the participants consume OTC drugs daily. **(Table III).**



"Figure 2: Source of information of OTC drugs"



"Figure 3: Distribution of Pre - Existing Medical Illness among the study participants"

"Table II: Percentage of Individuals with pre-existing medical Illnesses taking prescribed medications"

Pre-Existing Medical Illnesses	No. of Individuals with disease (N1).	No. of Individuals taking Prescribed Medications (N2)	% of Individuals with Pre-existing Medical Illnesses taking Prescribed Medications (N2/N1 x 100 = %)
Diabetes	97	97	100
Hypertension	64	43	67.2
Obesity	10	1	10
High Cholesterol	38	18	47.4
Cardiac Diseases	22	22	100
Kidney Diseases	3	3	100
Respiratory Disorders (Asthma, COPD, etc)	20	18	90
Stroke	6	6	100
Cancer	1	1	100
Other Illness (Hypothyroidism, Arthritis, etc)	29	11	37.9

"Table III: Frequency of use of OTC drugs for their Pre - Existing Medical Illness"

Variables	Frequency (n)	Percentage (%)
Frequency of OTC intake		
Daily	30	37.5
Weekly	25	31.3
Monthly	5	6.2
Occasionally	20	25

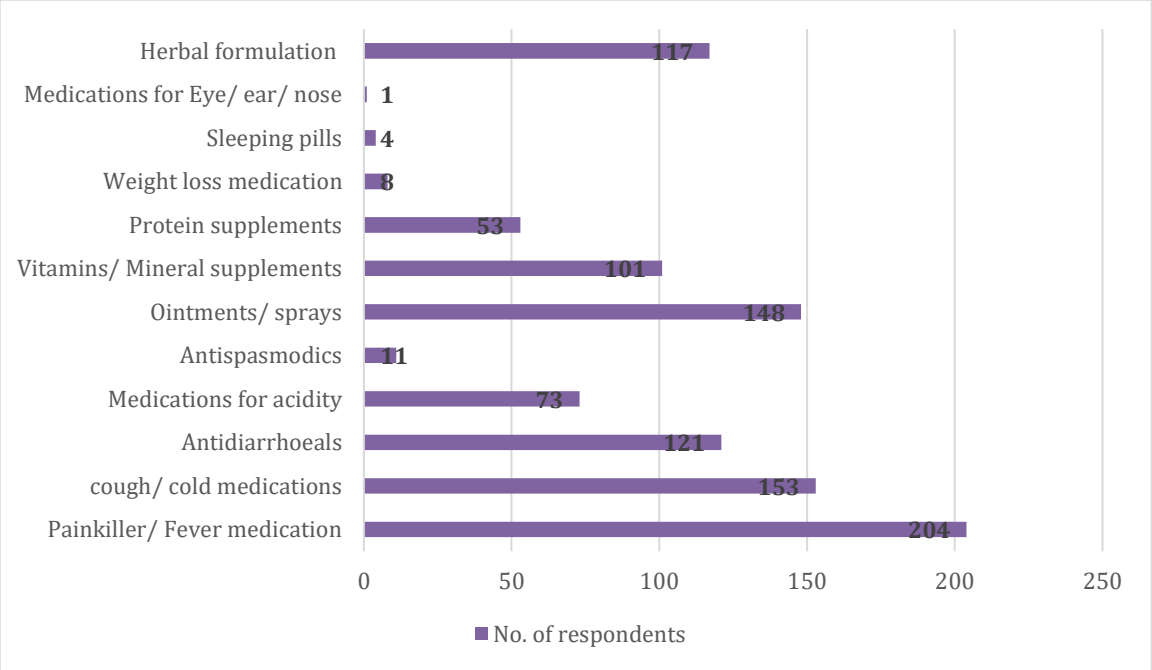
IV. Commonly used OTC medication

NSAIDs are the most used drug, accounting for 62.2% (n=204) of the usage by the study population. Among them, paracetamol being the drug of abuse. Next commonly used drug being cough/cold medications with 46.65% (n=153) of individuals using it. 45.12% (n= 148) of individuals use ointments / sprays for acute relief of pain and first aid for minor wounds. Many individuals prefer herbal formulations as an alternative or as an addition to their therapeutic drugs **(Figure 4).**

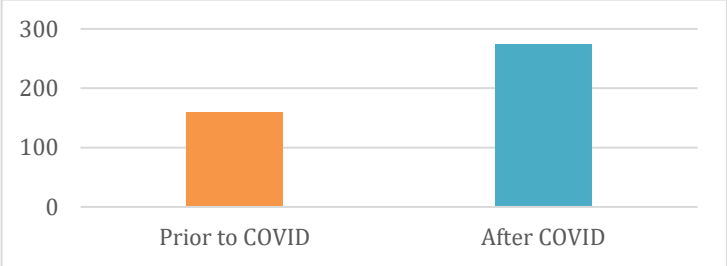
V. OTC Medication practices prior to and during COVID-19

93.12% (n=298) of our population were infected with COVID 19 during the Pandemic. Among them, 85.2% (n=254) presented with mild symptoms, 13.76% (n=41) with moderate symptoms and 1.07% (n=3) admitted in the ICU for severe infection. 93.96% (n=280) of those infected had taken OTC Medications for COVID with Paracetamol and azithromycin accounting for the major abuse. **Figure 5** compares the use of OTC drugs before the pandemic and during the pandemic to manage COVID-19 symptoms. The frequency of OTC intake has increased from 48.4 % prior to covid to 83.4 % during COVID-19.

Chi square test was performed to compare OTC use before the pandemic and during the pandemic with socio-demographic variables **(Table IV).** The results showed statistically significant differences between OTC usage and educational qualification, age group, marital status, employment and geographical location. The percentage of increase in utility of OTC during and after COVID was noted in the age group above 50 years and in the unemployed/retired rural population.



"Figure 4: OTC Medications taken by individuals for their illness"



"Figure 5: OTC use prior to and after COVID-19"

"Table IV: Relationship between Socio-Demographic Profile and OTC Use"

Demographics Variables	OTC Use Prior to COVID-19 n(%)	OTC Use During COVID-19 n(%)	Percentage of increase
Educational qualification**			
High School and higher secondary	45 (28.3)	53(19.3)	17.7
Undergraduate			
Postgraduate	82(51.6)	125(45.5)	52.4
	32(20.1)	97(35.3)	203
Age group***			
18-30	96(60.4)	130(47.3)	35.4
31-50	56(35.2)	103(37.5)	83.9
>50	7(4.4)	42(15.3)	500
Marital status**			
Single	93(58.5)	128(46.5)	37.6
Married	66(41.5)	147(53.5)	122.7
Employment***			
Unemployed / Retired	32(20.1)	108(39.3)	237.5
Self-Employed	60(37.7)	70(25.5)	16.6
Employed	67(42.1)	97(35.3)	44.7
Geographical Location**			
Rural	34(21.4)	90(32.7)	164.7
Urban	125(78.6)	185(67.3)	48

***: significant ; **: very significant; ***: highly significant**

VI. Perception, knowledge and awareness assessment regarding OTC drug use

Many (68.3%) participants do not provide information about their OTC use to their consulting doctor. 60.1% felt that OTC medications were less effective when compared to prescribed medications **(Table V).** Majority (59.8%) of the representative population are unaware of the dose, interactions and adverse drug reactions on taking OTC medications. Statistics are promising towards the prevalence of adverse drug events with most individuals resorting to stopping the drug after an adverse drug event (73.3%) **(Table VI).**

"Table V: Perception Assessment among Individuals using OTC Medications"

Perception assessment	Response	n (%)
Perception Towards Prescription Reuse	Yes	130(39.6)
	No	198(60.4)
Relevant OTC drug history provided to Practitioner	Yes	224(68.3)
	No	104(31.7)
Perception on effectiveness of OTC drugs	More Effective	52(15.9)
	Less Effective	197(60.1)
	Equally Effective	79(24.1)

"Table VI: Awareness Assessment among Individuals using OTC Medications"

Variables	Response	n (%)
Knowledge on drug dosage, interaction and adverse Drug Reaction (n= 287)	Yes	132(46)
	No	155(54)
Response to adverse drug reactions	Consulted Private Clinic / Hospital	2(13.3)
	Consulted PHC / Government Hospital	1(6.6)
	Took Medications from Pharmacy	1(6.6)
	Stopped taking the Medication	11(73.3)

DISCUSSION

Over the counter medications are drugs sold to the customer directly without a prescription. In addition to drugs, sanitary napkins, sanitizer, supplements, pregnancy test kits, and birth control products are also included in the OTC category. The research conducted was a cross-sectional study to evaluate the use of OTC Medications among the population of Tamil Nadu and Puducherry. The prevalence of OTC use was 48.4 % prior to COVID and increased to 83.4 % during COVID. A study conducted among the adolescent population of Karnataka reports increased numbers of use of self-medications of up to 78.6%.[6] This rise in prevalence is attributed to improved self-care practices to battle against the pandemic. Common factors influencing OTC usage being recommendations by friends / relatives (44.1%) and the Internet (36.2%) which were in relation to Bhattarai N, et al., study, where Internet and known friends / family were major reasons behind self-medication practices.[7]

Studies showed that OTC use was increased due to less knowledge possessed by individuals with lower income and uneducated or non-degree holders.[8] This is in contrast with our study with under and postgraduates being the population with maximum OTC purchase. Participants reported that they buy OTC to save time and money. On the other hand, Shaghaghi A et al., reports 'mild illness' to be a major causative factor and 'money and previous experiences' to be minor reasons for the use of self-medications.[9] However, our data could be interpreted in the setting of COVID-19 where money and cost-effectiveness might be of presumable significance with increasing economic crisis and financial instability within the state. The elderly population however, reported 'lack of accessibility to

hospitals' and 'lack of support and assistance' as factors that underlie their use. Helal RM et al., reports were consistent with our findings where 'unavailability of health services' was the major cause that underlie the use of self-medication among the general population.[10]

The association of European self-medication industry reported pain, cold, cough and diarrhea as common intake of self-medication which is in comparative with the increased use of painkillers (NSAIDs) cough/cold medications reported in our study.[7] Our study also notes the use of herbal supplements which accounts to 35.7% possibly due to the increased availability and marketing of traditional medicines in our state. Increased use of herbal medications (35.67%) which Pal SK et al., attributes to a better cultural acceptability, better compatibility and minimal side effects.[11] Nevertheless, the safety of OTC herbal medications is highly compromised. This can be a result of lack of suitable quality controls, existing data and patient information. This is coupled with inadequate labeling and listing of possible risk factors associated with its use.[12] Similarly, our study reports increased use of iron/vitamin supplements (30.8%) which hold increased risks of overuse and adverse drug events such as gastrointestinal distress, hypercalcemia and impaired immune function, especially among individuals who use more than one source of supplements.[13]

93.12% of our population were infected with COVID-19 during the pandemic. However, most (85.2%) presented with mild symptoms with nearly 93.96% of those infected had taken OTC medications for COVID-19. While 92.28% of individuals report using paracetamol for the relief of symptoms. The increased dependency on OTC Medications during the pandemic poses a rising threat. Unproven information through the mainstream media over means to combat COVID-19 such as 'Ivermectin' use as a prevention-prophylaxis drug, may affect the central nervous physiology and can pose serious risks through drug interactions that may present with fatal incidents.[14]

Perception assessment revealed that OTC medications to be less effective (60.1%) than the prescribed drug. But still the increasing preference by the participants may be attributed to the easy buying option through nearby pharmacies. It is imperative to note that a significantly high proportion (31.7%) did not inform the doctor about the OTC drugs taken. A study on physician-patient communication concludes that only 1/3rd of physicians asked questions to the patients regarding OTC medications, which could also be an imperative factor in what the patient deemed to be necessary.[15] 59.8% of the representative population are unaware of the dose, interactions and adverse drug reactions on taking OTC medications. Statistics are promising towards the prevalence of adverse drug events (46%) with most individuals resorting to stopping the drug in the presence of an adverse drug event. The risk of OTC abuse or misuse seems to increase after the pandemic. Regular monitoring and education about the OTC drugs should be promoted to ensure safe utility of OTC drugs. Nevertheless, our study does pose certain limitation like a small sample size of the data.

CONCLUSION

We thus conclude that the study revealed that the prevalence of OTC medication use is increasing during and after the pandemic. The internet and recommendations by friends and relatives serve to be major factors driving OTC drug abuse. Patients with pre-existing medical illness tend to take OTC drugs along with prescribed medications. Paracetamol being the drug of abuse, post pandemic. However, there still exists more than half of the population who continue to use OTC medications despite being unaware of the drug characteristics dose or adverse drug events that could pose a fatal risk. We believe that understanding public opinion towards its use would serve as supportive evidence towards better control of over-the-counter medications in the situation where an epidemic or a pandemic shall rise again.

ACKNOWLEDGEMENTS

None

REFERENCES

1. World Health Organization. Guidelines for the regulatory assessment of medicinal products for use in self-medication. Geneva: World Health Organization; 2000.
2. Menary KR, Kushner MG, Maurer E, Thuras P. The prevalence and clinical implications of self-medication among individuals with anxiety disorders. Journal of Anxiety Disorders. 2011;25(3):335–9.
3. Thomas L, Jayakrishnan SS, Joseph S, Varghese N, Dileep C, Rasheed A. Assessment of OTC drug labels for patient information in community pharmacies in Thiruvananthapuram city. Int J Innov Pharm Sci Res. 2014;2:1034-41.
4. Kennedy JG. Over the counter drugs. BMJ. 1996 Mar 9;312(7031):593–4.
5. Malik M, Tahir MJ, Jabbar R, Ahmed A, Hussain R. Self-medication during Covid-19 pandemic: challenges and opportunities. Drugs & Therapy Perspectives. 2020 Dec;36(12):565-7.
6. Mathias EG, D'souza A, Prabhu S. Self-Medication Practices among the Adolescent Population of South Karnataka, India. Journal of Environmental and Public Health. 2020 Sep 7;2020:1–6.
7. Bhattarai N, Basyal D, Bhattarai N. Self medication practice among undergraduate pharmacy students in Kathmandu Valley, Nepal. International Journal of Pharma Sciences and Research. 2014;5(11):737-46.

8. Shrank WH, Cox ER, Fischer MA, Mehta J, Choudhry NK. Patients' perceptions of generic medications. Health affairs. 2009 Mar;28(2):546-56.
9. Shaghaghi A, Asadi M, Allahverdipour H. Predictors of self-medication behavior: a systematic review. Iranian journal of public health. 2014 Feb;43(2):136.
10. Helal RM, Abou-ElWafa HS. Self-Medication in University Students from the City of Mansoura, Egypt. Journal of Environmental and Public Health. 2017;2017:1–7.
11. Pal SK, Shukla Y. Herbal medicine: current status and the future. Asian Pac J Cancer Prev. 2003 Aug-Dec;4(4):281-8.
12. Raynor DK, Dickinson R, Knapp P, Long AF, Nicolson DJ. Buyer beware? Does the information provided with herbal products available over the counter enable safe use?. BMC medicine. 2011 Dec;9(1):1-9.
13. Ford KL, Jorgenson DJ, Landry EJL, Whiting SJ. Vitamin and mineral supplement use in medically complex, community-living, older adults. Applied Physiology, Nutrition, and Metabolism. 2019 Apr;44(4):450–3.
14. Molento MB. COVID-19 and the rush for self-medication and self-dosing with ivermectin: a word of caution. One Health. 2020 Dec;10.
15. Sleath B, Rubin RH, Campbell W, Gwyther L, Clark T. Physician–patient communication about over-the-counter medications. Social Science & Medicine. 2001 Aug;53(3):357–69.