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Assessment of self-medication usage practices for treatment and prevention of COVID-19 – a cross-sectional study from Hyderabad Metropolitan Region, India

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Abstract

Background: Lack of proper knowledge combined with fear and anxiety fuelled by misinformation on social media tempted people to use self-medication (SM) for prevention of COVID-19. This study aimed to estimate the prevalence of self-medication practice for treatment and prevention of COVID-19 and study its associated factors in Hyderabad metropolitan region, India.

Materials and Methods: A cross-sectional study was conducted among people with high probability of contacting COVID-19 infection based on their occupation. Data collected includes types of medication, for what type of symptoms, name of the drug, duration, frequency of self-medication, reasons for taking medication, procurement and side effects. Chi-square test and Fisher's Exact T test were used for analysing categorical variables. $P < 0.05$ was considered as statistically significant.

Results: Majority of the study participants (79.8%) were between 21-45 years with a median age of 30 years (IQR 28-38.75 years) and 95.2% were males. More than one third (35.6%) were healthcare personnel followed by police and allied services (24.4%). The most commonly used products used were antipyretics and analgesics (47.2%) and antacids (45.0%) followed by antibiotics (23.2%). Young age ($aOR=1$; $p < 0.001$), above secondary education ($aOR=1$; $p=0.018$), history of alcohol use ($aOR=1$; $p=0.089$) and smoking ($aOR=1$; $p=0.03$) were associated with self-medication.

Conclusion: Young educated males were found to use self-medication for prevention of COVID-19. Antipyretics, analgesics, antacids and antimicrobials were mostly used. Majority participants obtained medicines from pharmacy shops. Awareness campaigns are essential to prevent misuse of self-medication and promote rational use of medicines.

Keywords: Analgesics, Antipyretics, Antibiotics, COVID-19, Metropolitan region, Rational use of medicines

Background: The COVID-19 pandemic started with reporting of cases of pneumonia of unknown cause from Wuhan, China in December 2019 (1). The patients presented with fever, difficulty in breathing and consolidations in chest X-ray. The COVID-19 pandemic caused by SARS-COV-2 was

declared as public health emergency by World Health Organization (WHO) on 30th January 2020 (2). India reported 42.5 million confirmed cases confirmed cases of COVID-19 with 0.52 million deaths till 1st April 2022 (3,4)

Though the disease burden now has been reduced but still there is reporting of new cases throughout the world. Till date there has been no definitive treatment available for the SARS- COV-2. Many drugs like chloroquine or hydroxychloroquine with or without azithromycin have also been evaluated for prophylaxis and treatment against COVID-19 (5–7). Though preclinical studies showed good results, their effectiveness to prevent COVID-19 has not been confirmed in clinical studies (8, 9). WHO on 17 June 2020 declared to stop the hydroxychloroquine (HCQ) arm of the Solidarity Trial for COVID-19 (9). Many other drugs have been repurposed for use for prophylaxis and treatment of COVID-19 disease like ivermectin, doxycycline (10,11).

During the second phase of pandemic, high mortality observed in some countries created panic among people. Ignorance and lack of information among the public led people to self-medicate (12). In India, there was a surge in the use of self-medication during this COVID-19 pandemic due to ignorance and anxiety. There have been media reports published about adverse drug reaction due to practice of self-medication during the pandemic. Studies have been done to assess the self-medication practice among general population for COVID-19 in Togo and Peru (13, 14). But there are only few studies regarding use of self-medication practice in India for COVID-19 by common people (15). In the above context, this study was undertaken with aim to estimate the prevalence of self-medication practice for COVID-19 among general public in Hyderabad Metropolitan Region, Telangana, India and evaluate associated factors in context of COVID-19 pandemic.

Materials and Methods:

Study design and study population: The study was approved by Institutional Ethics Committee of AIIMS Bibinagar vide AIIMS/BBN/IEC/Feb/2021/03/ 24.02.2021. This cross-sectional study was conducted according to the principles of Declaration of Helsinki and ICH-GCP protocol. Data was collected between March 2021 and September 2022. This study participants included persons aged 18 years and above who were at risk of getting infection during this COVID-19 pandemic period. Persons who were diagnosed and treated with COVID-19 in past three months, affected with mental disorders and persons with history of substance abuse were excluded.

Sample size and sampling methods: Sample size was calculated using the single proportion population formula with the overall prevalence of self-medication practice 34.2%, 95% confidence interval and design effect of 1 and non-response rate of 10% (13). The minimum calculated sample size was 380. However, 500 participants' data were collected during the study period.

Data collection: After screening for the eligibility criteria and obtaining written informed consent their socio-demographic characteristics, knowledge regarding COVID-19 infection and self-medication practices were collected using pre-structured standardized questionnaire. The questionnaire was developed by five medical doctors including one epidemiologist and was tested on a sample of ten

health care professional, five policemen, five taxi drivers and ten patient attendants. Few questions were removed and few questions were modified which were found to be complicated and unanswerable, considering the lowest level of understanding. The questionnaire was validated with Intra Class Correlation (ICC = 0.708).

Independent variable: For socio-demographic variables, the age in years variable was divided into categories; 18–20, 21–30, 31–45, 46–60, 61 and above. Gender was categorized as male and female. History of alcohol usage and smoking was categorized as yes and no. Education was classified as illiterate, primary, upper-primary, secondary, higher secondary, graduate, post graduate and above based on Indian Standard Classification of Education 2014 (16). During bivariate analysis, the age was categorized as less than or equal to 45 years and above 45 years, education as secondary and below and above secondary.

Outcome variable: The outcome variable was self-medication practice in study participants. The assessment was done for study participant's selection, procurement and use of medicines to treat or prevent COVID-19 without any advice of any doctor. Other questions included like types of medication, for what type of symptoms, name of the drug, duration, frequency of self-medication, reasons for taking, sources of those medications and development of any side effects after self-medication.

Statistical Analysis: Descriptive statistics were presented as frequencies and percentage of categorical variables. Chi-square test and Fisher's Exact T test were used to analyze categorical variables. Univariate analysis was done and odds ratio was calculated with 95% confidence interval (CI). Variable with p values < 0.25 were selected for multivariable step wise backward logistic model regression. The factors associated with self-medication practices for calculation of adjusted odds ratio with 95% CI were assessed. Forest plot was drawn to show the odds ratio with 95% CI with overall effect kept at 1. P value less than 0.05 was considered to be statistically significant.

Results and Discussion: Sociodemographic characteristics: Table 1 showed, majority of the study participants (79.8%) were between 21–45 years with a median age of 30 years (IQR 28–38.75 years) and 95.2% were male. More than one third (35.6%) were healthcare professionals followed by police and allied services (24.4%). Most of the study participants were males. These group of people were supposed to be the most susceptible to contact COVID-19 due to their occupation. More than two third participants have secondary school education and above. Out of all study participants 15.6% were found to consume alcohol and 15.8% were smokers. Most of the study participants were graduate and above (55.4%). (Table1).

Self-medication practices: The overall prevalence of self-medication practices was 78.6%. The most commonly used products used by participants were antipyretics and analgesics (47.2%) and antacids (45.0%). Fever and headache (57.0%) followed by cough and cold (50.4%) were found to be the major reasons for usage of self-medication. Few participants also used ivermectin (7.4%) and azithromycin (6.6%), doxycycline (6.0%) for prevention of COVID-19. Among study participants, 21.4% didn't use

any kind of medications. Pharmacy (32.8%) was the major source of products for self-medication of participants. Nine percent of study participants developed side effects after consumption of drugs.

Factors associated with self-medication used: In the univariate analysis age more than 45 years (OR= 0.003; p value = 0.0001), consumption of alcohol (OR= 4.654; p value = 0.0001), smokers (OR= 4.732; p value = 0.0001) and education above secondary levels (OR= 0.504; p value = 0.003) were significantly associated with self-medication usage. Multivariable logistic regression model analysis showed three factors were positively associated with self-medication: age more than 45 years (aOR=0.003; $p \leq 0.001$), history of smoking (aOR=5.133; $p = 0.03$) and education above secondary level (aOR= 0.408; $p = 0.018$) (Table 3, Fig 1).

Results of our study is in contrast to the findings of other similar studies done outside India, which estimated the SM practice during first phase of COVID-19 pandemic (13, 14). Our study was conducted during the second phase of the COVID pandemic in India. The morbidity and mortality in the second phase of COVID-19 pandemic was much greater than the first phase. The participants practiced SM if they had symptoms of fever and headache, cough and cold or acidity for at least two days. Among the allopathic drugs used hydroxychloroquine/ chloroquine use was followed by ivermectin, azithromycin and doxycycline. Other most common drugs used for SM were multivitamins, antacids followed by home medicines and traditional medicines (**Table 2**). In India, dispensing of scheduled drugs is not strictly monitored except for controlled psychoactive substances (22). Many participants obtained leftover drugs from friends and relatives. Most of the participants have used the SM once daily for suspected COVID-19 symptoms but only 9% reported to have developed side effects. Probably they could not have been able to differentiate the symptoms of viral fever and side effects from the medications.

There was a positive correlation between female gender and SM practice among the study participants. This could be due to high health anxiety and fear that hospitals and clinics are the most contagious places (23). Participants who had smoking and alcohol use habit were seen to use SM as seen by the adjusted odds ratio values (Table 3, Figure 1). But it could not be ascertained whether the use of alcohol or smoking was decreased or increased by the pandemic. Although it has been already established that the use of these substances especially in young age group is more related to the anxiety and post-traumatic stress disorder (23-26). The use of these substances along with antimicrobials could pose a health concern.

The World Health Organization (WHO) advocates promoting self-medication to decrease the burden on health care services, especially in low resource countries in a pandemic situation as a means to treat common diseases and minor ailments in the community which can be effective when practiced correctly (27). However, SM can lead to incorrect self-diagnosis, wrong choice of therapy, incorrect route and dose of drug administration and severe adverse effects. People often don't recognize that the same active substance (drug) is already being taken under a different name. They fail to recognize contraindications, drug interactions, and precautions, correct route of administration, appropriate dosage

of the medicine which gives rise to more risks. Inappropriate use of antibiotics could lead to antimicrobial resistance (28). People often resort to drug hoarding out of fear which creates a vicious circle of drug-induced diseases.

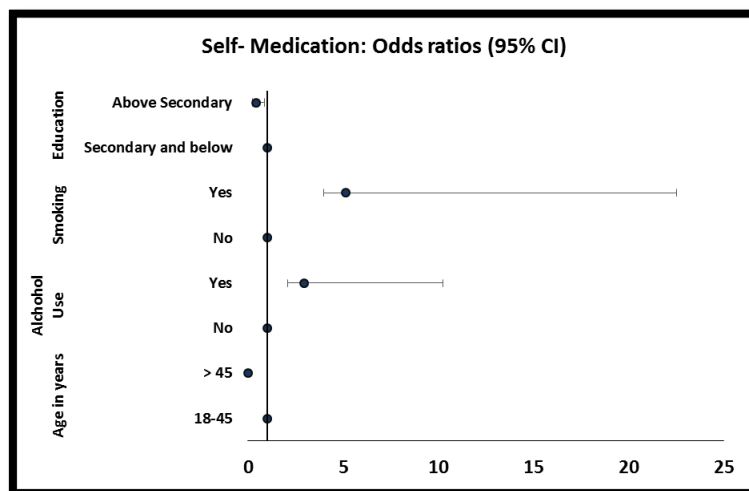


Fig. 1 shows factors associated with self-medication to prevent the infection to COVID-19 in high-risk populations, Hyderabad, India in a binary logistic multivariable model. These associations were expressed as adjusted odds ratios.

Table 1: Sociodemographic characteristics of study participants

Sociodemographic variable		Frequency	Percent
Age in years	18-20	32	6.4
	21-30	250	50.0
	31-45	149	29.8
	46-60	52	10.4
	61-70	17	3.4
Gender	Female	24	4.8
	Male	476	95.2
Alcohol Use	No	422	84.4
	Yes	78	15.6
History of smoking	No	421	84.2
	Yes	79	15.8
Education	Illiterate	5	1.0
	Primary and Upper-Primary	157	31.4
	Secondary	50	10.0
	Higher Secondary	11	2.2
	Graduate	156	31.2
	Post Graduate and above	121	24.2
Occupation	Healthcare professionals	178	35.6
	Police and allied services	122	24.4

	Delivery agents	83	16.6
	Transport services	46	9.2
	Shopkeepers	41	8.2
	Other	30	6.0

Table 2: Self medications used for COVID-19

Questionnaire related to self-medication practice (n = 500)		Frequency	Percent
Self-medication usage	Yes	393	78.6
	No	107	21.4
Types of medication	Antipyretics and analgesics	236	47.2
	Antacids	225	45.0
	Antibiotics	116	23.2
	Antihistaminics	40	8.0
For what type of symptoms	Fever and headache	285	57.0
	Cough and cold	252	50.4
	Acidity	191	38.2
	Nausea and vomiting	55	11.0
Name of the drug	Hydroxychloroquine/Chloroquine	68	13.6
	Ivermectin	37	7.4
	Azithromycin	33	6.6
	Doxycycline	30	6.0
	Vitamins	208	41.6
	Traditional medicines	40	8.0
	Home remedies	156	31.2
	Others	17	3.4
	Not taken any of the above	107	21.4
Duration of symptoms	1 day	58	11.6
	2 days	73	14.6
	5 days	83	16.6
	7 days	16	3.2
	> 7 days	163	32.6
	No Medications used	107	21.4
Frequency of self-medication	Once a day	195	39.0
	Once a week	108	21.6
	Once a month	90	18.0
	No Medications used	107	21.4
From where did they get those medications	Pharmacy	164	32.8
	Hospital	132	26.4
	Friends	23	4.6
	Relatives	11	2.2
	Leftover drugs	63	12.6
Development of any side effect	Yes	45	9.0

	No	292	58.4
	Not sure	163	32.6

Table 3: Factors associated with self-medication used for COVID-19

		Self-Medication		Univariate analysis		Multivariate analysis	p value
		Yes	No	OR (95% CI)	p value	aOR (95% CI)	
Age in years	18-45	391 (90.7%)	40 (9.3%)	1	0.0001	1	0.0001
	> 45	2 (2.9%)	67 (97.1%)	0.003 (0.000, 0.0129)		0.003 (0.001, 0.012)	
Gender	Male	373 (78.4%)	103 (21.6%)	1	0.562		
	Female	20 (83.3%)	4 (16.7%)	1.381 (0.4617, 4.129)			
Alcohol Use	No	320 (75.8%)	102 (24.2%)	1	0.0001	1	0.089
	Yes	73 (93.6%)	5 (6.4%)	4.654 (1.831, 11.83)		2.952 (0.847,10.259)	
H/o smoking	No	319 (75.7%)	102 (24.2%)	1	0.0001	1	0.03
	Yes	74 (93.7%)	5 (6.3%)	4.732 (1.862, 12.03)		5.133 (1.170, 22.527)	
Education	Secondary and below	180 (84.9%)	32 (15.1%)	1	0.003	1	0.018
	Above Secondary	213 (74.0%)	75 (26.0%)	0.504 (0.319, 0.7989)		0.408 (0.193,0.860)	

aOR: adjusted odds ratio, CI- Confidence interval, P < 0.05 significant

Conclusion: This study was aimed to assess the prevalence of self-medication practice among urban working population for the practice of self-medication for COVID-19 in India. Majority of the study participants were of young age group and educated. Approximately two-third participants reported to have practiced self-medication. It was found that healthcare professionals (excluding doctors), women and people with a high level of education were the mostly found to practice self-medication. Antipyretics, analgesics, antacids, antibiotics, multivitamins and traditional home medicines were the most commonly used products. Most participants received medications from pharmacy. WHO recommends teaching self-medication practice with the right approach and proper regulation. Proper education should be given by awareness campaigns to people regarding ill effects of self-medication and to be aware of the misinformation circulated in social media especially in any pandemic situation like COVID-19. Strict regulation of distribution of scheduled drugs should be done to control the misuse of antimicrobials and other scheduled drugs. It is also essential to sensitize and seek cooperation from the pharmacists to prevent self-medication.

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Conflict of Interest: The authors declare that there is no conflict of interest.

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