

## A Cross Sectional Survey on Self-Medication Practices during the COVID-19 Pandemic among the General Population in India

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### Abstract

**Background:** Self-medication(SM) trend has been reported to have increased worldwide due to a surge in the internet usage particularly during and after the pandemic. This global trend has posed a great challenge for clinical practice more so as there was a rise in the availability of new and repurposed pharmaceuticals.

**Objective:** 1) To assess the prevalence and pattern of SM during covid-19 pandemic among the general population. 2) To determine demographic variables and adverse events associated with SM. 3) To evaluate the drugs commonly used.

**Materials and Methods:** This pre-validated questionnaire-based cross-sectional survey was conducted between July 2021 to September 2021 on 400 subjects of the general population. The categorical variables were represented using frequencies and percentages. The chi-squares test used to see the statistical significant level and binary logistic regression were performed to determine the probable factors associated with SM practice.

**Results:** The study showed a prevalence of self-medication as 83% during Covid-19. There was also a significant increase in self-medication practice during the COVID-19 pandemic due to anxiousness (68.7%) among respondents. According to our results, 93% of respondents had heard about SM through pharmacist, the media, family, friends. Most commonly used drug was paracetamol primarily used for fever (76.2%). 2.7% of respondents reported adverse events. SM practices were more among the females and employed individuals.

**Conclusion:** The study revealed the there was increase in the practice of SM during Covid time which was due to panic and anxiousness driven by wide media coverage on COVID 19, lockdown, restricted availability of medicines. This study has shown that there is a need for continued awareness and education about the risks of Self-medication.

**Keywords:** Self medication, Covid 19, Drug use

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## Introduction

The discovery and rapid spread of COVID-19, a disease caused by the new coronavirus SARS-CoV-2, in China prompted the World Health Organization (WHO) to issue a worldwide health emergency declaration on January 30th, 2020. About 20 million cases and an estimated 700,000 deaths worldwide were recorded six months later [1].

The COVID-19 pandemic has triggered a global lockdown, leaving many people with the impression that their only resource is to self-help, self-care, and self-medicate. The latter was exacerbated by the fake news that accompanied the COVID-19 pandemic. In light of this situation and the plethora of information circulating on social media, various plants and substances have been suggested to treat or prevent COVID-19 without fulfilling the bare minimum of efficacy and tolerance [2].

SM, which is described as taking drugs, herbs, or home remedies on one's initiative or on the advice of another person without contacting a medical doctor was a trend during COVID-19 [3]. As of May 18, 2021, the ongoing COVID-19 affected more than 160 million people in more than 200 countries around the world and killed more than 3 million people [4].

Based on the frequency of Google searches since the COVID-19, this SM tendency has been claimed to have expanded globally [5]. Because the different prescription medications currently licensed for COVID-19 symptoms have severe drug reactions, this global rise has created a significant medical dilemma. Furthermore, there is a considerable danger of inappropriate dosage, poor administration method, longer use than indicated, improper storage, dependency, and increased prevalence of pathogenic drug resistance [6].

SM often leads to misdiagnosis, drug resistance, use of expired drugs leading to

toxicity, adverse events, adverse drug interactions, drug dependency, hypersensitivity to certain drugs, withdrawal symptoms, and countless other health problems. Recently the COVID-19 pandemic has increased the influence of social media regarding some misinformation about medications, leading to public confusion and panic. This has increased the use of SM, including home remedies, which have no proven safety and efficacy.

Hence, there is a need to investigate the practices of SM to prevent the above-mentioned consequences. There are very few studies and reports regarding the self-medication practices during COVID-19 and adverse events during the COVID-19 pandemic in the Indian population. Hence, the present study was taken up.

## Materials and Methods

A cross-sectional study was conducted from July 2021- September 2021 on the general population older than 18 years. The study was initiated after obtaining Institutional Ethics Committee (ECR/1628/Inst/KA/2021).

## Study Procedure

After obtaining approval and clearance from the Institutional Ethics Committee, a questionnaire-based survey was conducted on general population both online and offline forms ( Kannada/ English/ Hindi). Eligible study participants were fully informed of the study objectives to their satisfaction in both English and vernacular language and informed consent was obtained. Anonymity, confidentiality, and professional confidentiality were maintained for all participants. Participants who met the following selection criteria were included in the study. 1) Subjects >18 years of age 2) Both gender 3) Subjects with and without comorbid conditions 4) Subjects willing to participate in

the survey. Subjects with the subsequent conditions have been excluded from the study; 1) Respondents having involvement or knowledge on medical background (medical graduates, nurses, medical researchers).

A set of 15 pre-validated questionnaires were used for the survey to assess the prevalence, patterns, and variables that promote SM and to determine the adverse events and was standardized after conducting a pilot study on 100 subjects. The questionnaire was split into two sections. The participants' demographic information was given in the first section of the questionnaire (e.g. age, gender, education, occupation and place). The second portion of the questionnaire focused on the pattern, prevalence, and adverse events linked with SM during the COVID-19 pandemic.

### Statistical Analysis

Demographic data and categorical variables obtained were analysed using latest SPSS 27 software. The categorical variables were represented using frequencies and percentages. The chi-squares test used to see the statistical significant level of 0.05. Binary logistic regression was performed to determine the factors associated with Self-medication practice. The outcome /response variable was binary i.e., practiced self-medication (yes (1)) and no self-medication (no (0)). Bivariate models were used to estimate the crude odds ratio, and multivariate models were used to estimate the adjusted odds ratios (ORs), along with their 95 percent confidence intervals (CI) and P-values.

### Results

#### Participant socio demographic characteristics

Of the 400 participants in this study, 58% of the study participants were female, 42% were males and the majority of participants (45%) in the age group 35-54 year. 88% were employed as shown in Table 1. 93% of respondents had knowledge about SM, out of

which 83% practiced self medication during covid-19. The number of respondents practiced SM during Covid-19 were 76% male and 81% female.

#### Knowledge about Self-medication

93% of respondents had knowledge about SM. According to our results, 93% of respondents have heard about SM through pharmacists, the media, family, and friends.

#### Self-medication Practices Before and During Covid-19 pandemic

Respondents who had practiced SM before the COVID-19 pandemic there were 314(78.5%) and 86 (21.5%) who did not. People who practiced SM during the COVID-19 pandemic were 332 (83%), but 68(17%) did not(Figure 1). There was also a significant increase in the number of respondents practicing SM during the COVID-19 pandemic compared to practice before the pandemic (P <0.005 in the 95% confidence interval). Our study showed that an increase in SM during Covid-19 pandemic was due to anxiousness about Covid-19 pandemic 68.7% (Figure 2).

#### Pattern of Self-medications attributed to COVID 19 symptoms

Figure 3 shows the Pattern of SM attributed to COVID 19 symptoms by respondents. It was observed that for all symptoms, the most self-medicating drug was paracetamol for fever. 332 respondents reported taking at least one of the drugs in the case of fever, 288 respondents for fatigue, 305 for cough, 327 for sneezing, 201 for muscle pain, 332 for nasal congestion, 332 for sore throat, 279 for headache, 70 for breathing difficulty.

#### Adverse Events due to self-medication during covid-19 Pandemic

The results showed that 2.7% experienced adverse events after taking the medication they bought themselves. The most common adverse event was diarrhea(1.2%) followed by nausea (0.9%) and headache(0.6%).

Following adverse events (0.9%) respondents stopped taking medication,

(1.5%) visited pharmacist and (0.3%) visited doctor.

### Perception of self-medication

Majority of respondents (54.6 %) in our study said that SM should be discouraged and (45.4%) said that it should be encouraged.

### Factors prompting to self medication

**Table 2** - After controlling for the other variables multivariable logistic regression was performed. Males are less likely than females to self-medicate, according to the multivariable logistic regression model(OR: 0.72; 95% C.I:0.06, 0.59) and lower among unemployed compared to employed (OR: 1.53; 95% C.I:0.43-0.74).

**Table 1: Socio demographic characteristics.**

Characteristics		Frequency(%)
Gender	Male	168(42)
	Female	232(58)
Age	18-24	56(14)
	25-34	124(31)
	35-54	180(45)
	>55	40(10)
Education	Primary	28(7)
	High School	28(7)
	Graduate	180(45)
	Postgraduate and higher	164(41)
Occupation	Employed	352(88)
	Unemployed	48(12)
State	Karnataka	240(60)
	Tamil Nadu	60(15)
	Maharashtra	60(15)
	Andhra pradesh	40(10)

**Table 2: Crude and adjusted factors associated with self-medication**

Variables Overall	Crude estimate		Adjusted estimate	
	OR(95% C.I)	P value	OR(95% C.I)	P value
Gender				
Female	reference			
Male	0.81(0.02-0.51)	0.042*	0.72(0.06,0.59)	0.031*
Age				
18-24	Reference			
25-34	2.23(0.71-3.56)	0.082	2.10 (.53 -3.98)	0.91
35-54	1.14(0.06-4.27)	0.721	0.56 (0.01-4.28)	0.809
>55	2.02(0.07-3.53)	0.652	1.72(0.05,4.57)	0.881
Education				
Primary	Reference			
High School	0.12(0.00-2.01)	0.841	0.22(0.13-3.91)	0.899
Postgraduate and higher	1.28(0.052-4.12)	0.892		
Occupation				

Employed	Reference			
Unemployed	0.14(0.075-0.273)	0.031*	1.53(0.43-0.74)	0.042*

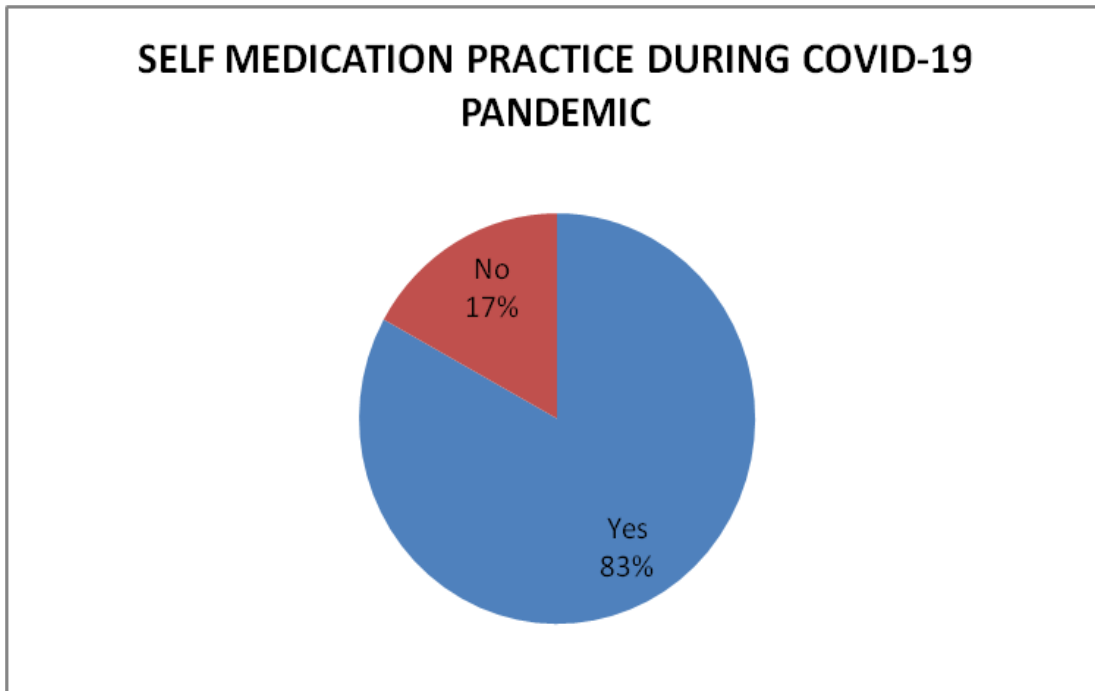


Figure 1 : Pie chart showing the self medication practice during covid-19 pandemic

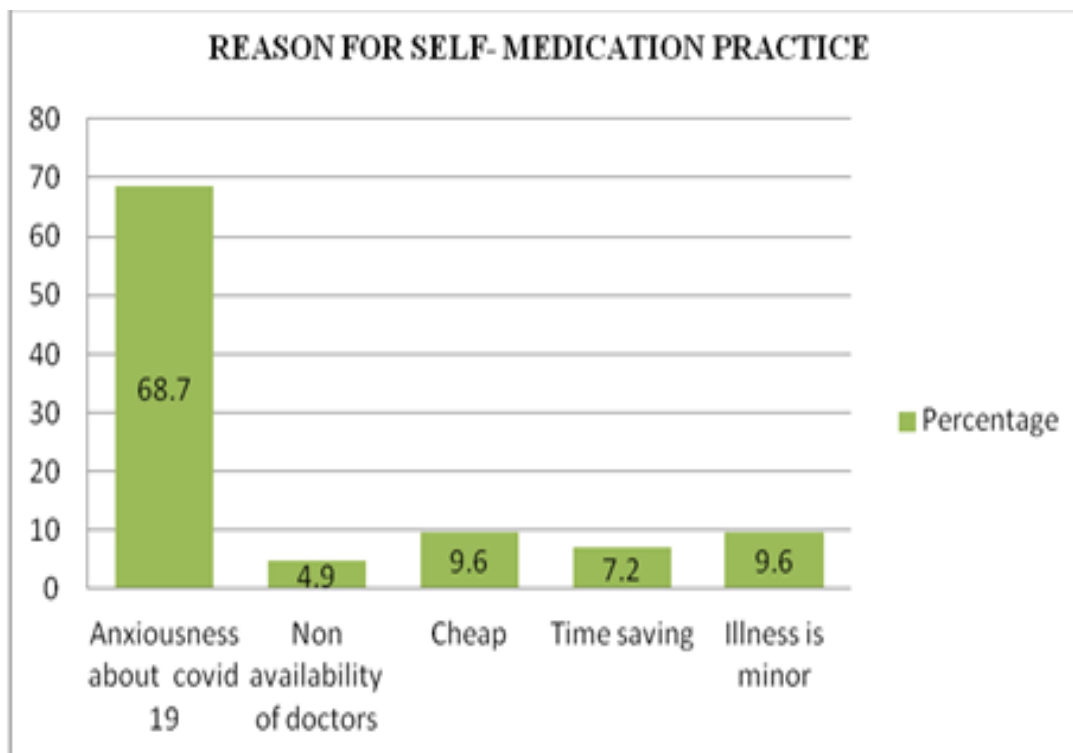


Figure 2: Showing Reasons for self medication practice

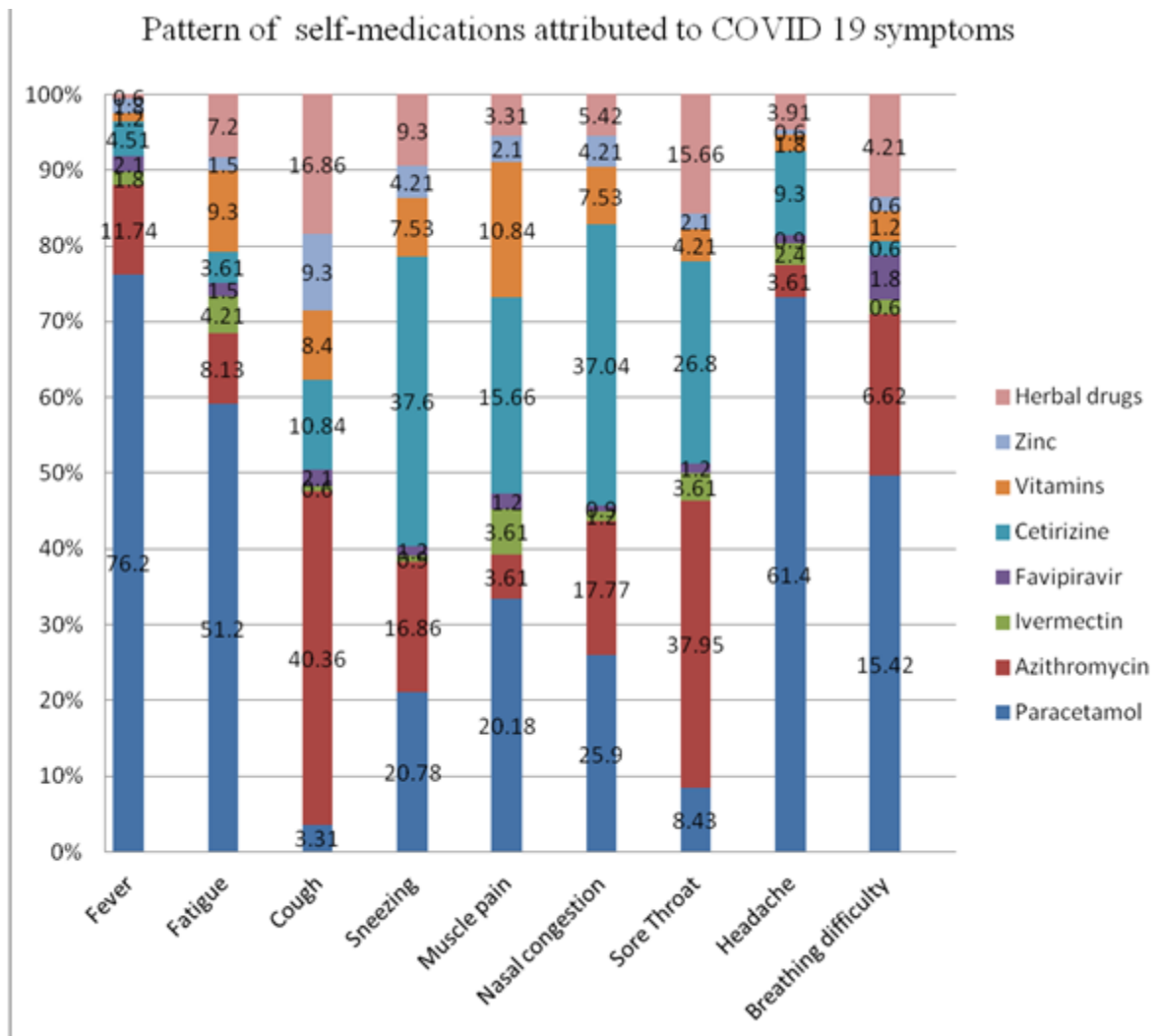


Figure 3: Pattern of self-medications attributed to COVID 19 symptoms

**Discussion**

SM with any drug, including antibiotics, is not advised by the WHO as a method of COVID-19 management or prevention. 83% of respondents in our study utilized a treatment without a prescription. Our study showed that there was an increase in the practice of SM during the Covid-19 pandemic, which is due to anxiousness about the Covid -19 pandemic, hospital facilities, lockdown, and expenses related to medications (Figure 2). This finding could be due to having additional distress due to high self-awareness of their health as reported by

Roberts *et al.* among people with higher educational status [7].

Our study correlates with Quispe-Canari JF *et al* study where paracetamol was the commonly used drug for SM [8,9]. The fact that its ingestion is regarded as non-toxic regardless is a matter of concern. The usual therapeutic dose of paracetamol is 0.5-1 g every 4-6 hours up to a daily maximum of 4 g, but more crucially, it has dose-dependent toxicity [10]. In patients with alcoholic liver disease or viral infections, paracetamol usage over a long period of time has been linked to

serious liver damage, even at therapeutic levels [11,12]. Being an over-the-counter (OTC) drug, paracetamol is a drug to be used with caution, especially since its sales have increased significantly during the COVID-19 pandemic [13].

Other frequently used drugs were azithromycin followed by cetirizine, herbal drugs, vitamins, zinc, ivermectin, and antiretroviral drug favipiravir were used without prescription in our study. Antibiotic use during self-medication is the leading cause of antimicrobial resistance; therefore, its intake must be regulated, as well as its appropriate use and disposal [14]. Vitamins and minerals were used by respondents often in our study.

In our study, favipiravir and ivermectin, whose sales increased globally in the aftermath of COVID-19, were found to be consumed in small amounts [15] 66.5% of respondents used herbal drugs for various symptoms of COVID-19 even though there is no proven efficacy and safety. The fact that traditional medicine is frequently employed in Indian culture could explain this conclusion.

The majority of respondents (54.6 %) said that SM should be discouraged, yet the proportion of respondents who actually use SM is still significant (83%). This may have resulted from the fact that SM practice cuts down on waiting time for a doctor and results in more cheap health care costs [16].

A few participants experienced adverse events after taking the medication without prescription (2.7%) the most common being diarrhea.

SM was found to be substantially linked with females and being employed in this study. Data on the relationship between sex and self-medication are contradictory [17,18]. According to a study of undergraduate students at a private university in Nigeria, 88.2 percent of females and 71.1 percent of males reported using SM [19]. In our study

the link between female sex and self-medication in the context of the COVID-19 outbreak was due to increased anxiety [20,21].

According to our findings, the prevalence of SM is higher among employed participants than among unemployed participants. Other studies like amritha lekha *et al* have also shown similar data [22]. The relatively higher prevalence of SM among the employed population may be due to the fact that seeking medical attention can require time and possibly loss of work days, which may explain their tendency for SM. The lower prevalence of SM in the unemployed population may be due to the financial implication.

This study produced very useful data because there is a scarcity of data on the prevalence, pattern, and adverse events associated with SM in the Indian population during the covid-19 pandemic. The main limitations of this study were the small sample size and the absence of drug dosage information in the questionnaire. Furthermore, some respondents may have answered incorrectly due to recall bias.

### Conclusion-

The study revealed the causes of self-medication as news of spread, effects, and remedies in media channels and also the internet; mental stress of lockdown and isolation, insecurity and panic concerning drug and care support deficiency.

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