COVID-19-Induced Dynamics in Self-Medication Practices and Influencing Factors among Pakistani Population

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Abstract

Self-medication practices possess both positive and negative impacts on people's health and healthcare systems. Because of the widespread concern about getting the Coronavirus disease from health personnel or general public, the Pakistani population has turned to self-medication for apparent prevention. The study aimed to evaluate the awareness, predictors, and increasing trend of self-medication comparatively before and during the Covid-19 outbreak in Punjab, Pakistan. A web-based questionnaire study was conducted by using non-probability sampling. Data was obtained and expressed as frequency & percentages using SPSS version 23. The possible association was determined by chi-square. Our results indicated 57% of respondents used medicines without a prescription, and 53% reported increasing practice explicitly during COVID-19. Herbal products such as Lemon with honey 71.8%, antibiotics 24.5%, and Senna leaves 37.2%, were utilized as immunity boosters. In contrast, altered medication patterns 35%, adverse reactions 24.4% highest effective measures include fruits & vegetables 44% and following SOP 40%. Major predictors were lack of transport 24.8%, family opinion 28.8%, and unreachable to hospital 24.4%. The most prominent ailments reported to be fever/body ache 42.1%, vomiting/nausea 32.5, cough/sore throat & low/high BP both were 28.1%. Self-medication has become a serious concern, particularly due to the Covid-19 outbreak. The determinants of self-medication need to be understood to design adequate medicine information policies and patient-dispenser education strategies via pharmacy and press integrated approach.

1. Introduction

As the number of Corona cases increased in Pakistan and throughout the world, a state of fear and psychological pressure has developed. The government of Pakistan started taking precautionary measures in line with International Health Regulations as per World Health Organization (WHO) guidelines for establishing and strengthening preparation for the COVID-19 pandemic soon after the first case was identified in the country in February 2020 followed by the lockdown, mobility prohibitions, screening of sick people, proper hand washing, and limited public contact [1]. WHO defines self-medication as a practice where a person self-administers treatment for a physical ailment by using a chemical or other influence to treat a minor medical condition nevertheless; several dangers are associated with it. Over-the-counter medications, drugs, and dietary supplements are the most commonly utilized substances to address common health problems at home such as cough, migraine, fever, sore

throat, lethargy, joint aches, vomiting, nausea, and diarrhea without visiting a healthcare professional [2-3]. As a result of the incidence of COVID-19, there has been a surge in self-medication among many populations, including healthcare personnel. Many people have ceased accessing healthcare institutions for medical treatments due to concerns about getting COVID-19 and inconvenience of getting medication. Consequently, numerous health risks have been raised outside of healthcare institutions.

Amidst the chaotic state, when healthcare centers were being decentralized in most affected states; developing nations with poorly defined healthcare structures started facing mayhem [4]. The way people react to traumatic situations is influenced by their demographic background [5]. People are concerned about their own and their families' health during this pandemic which might result in changes in sleeping or eating routines, as well as worsening of chronic health conditions, overuse of antibiotics, herbal remedies, and

supplements. Prior to the outbreak, self-medication was popular in Pakistan, including the ingestion of natural items by natives [6-7]. Lots of prescription-only drugs like antibiotics (ciprofloxacin) anti-parasitic, antimalarial, calcium or vitamin supplements, and paracetamol have been in common practice by many populations. Analgesics, anti-depressants, antidiarrheal, and numerous herbal and homeopathic medicines are the most often consumed medications [8]. Even though many healthcare regulations around the globe discourage the practice of dispensing medicines without a prescription, a certain lack of control over prescribed medicine or antibiotics is still reported [9].

Major factors responsible for the rise in self-medication include inadequate resources and time management, minimal awareness, media advertisement, a pile of medicine stock at home, and reusing old prescriptions. Moreover, delayed admittance to medical services places, usage of herbal therapy, fear of quarantine and stigmatization, easy availability of medication, personal satisfaction or dissatisfaction towards doctors, and poverty are also contributing factors [10]. COVID-19 has put a burden on the healthcare system in economically unbalanced nations like Pakistan, aside from having more accessibility to health-related facts and drugs [11]. The average regular self-treatment user with little or no understanding of the therapeutic principles brings about certain dangers and delays in the diagnosis and treating significant medical conditions that can result in both physical and financial harm causing lethal outcomes [12]. In this background, the rationale of this study was to assess the frequency of various kinds of natural/herbal/synthetic medicines and products/foods being utilized by the public as precautionary means against Covid-19. It can assist decision-makers in developing better-tailored health policies for the general population.

2. Materials and methods

A cross-sectional, descriptive, and questionnaire-based study was designed and conducted by using non-probability sampling (voluntary response sampling technique) across the Punjab region of Pakistan during the COVID-19 outbreak second wave when Punjab was under lockdown for a rapidly increasing number of COVID-19 cases once again from December 2020 to March 2021. With the lockdown state of affairs in mind, an online questionnaire was prepared on Google Forms and distributed via the WhatsApp and E-mail with requests to share and invite more individuals for maximum participation followed by weekly reminders. To preserve confidentiality and uniformity, the shared questionnaire was kept anonymous containing 40 questions, including 5 on demographics, 18 about general feedback on self-medication and health status, and 6 about the usage of natural and herbal foods intake and comparative questions of self-medication practices before or during the Covid-19 epidemic.

2.1. Data Anthology

This enclosed the collection of factors like age, gender, and profession based on the frequency and probability of self-medication modification strategies during the pandemic. Other questions were focused on having any chronic disease, the potential side effects of self-medication, observational methods, and general or specific feedback on self-medication before and during the COVID-19 pandemic.

2.2. Participants Inclusion Criteria

This includes people above 17 years of age and all genders who were knowledgeable about study's objectives. Verbal approval was obtained to affirm that they understood each aspect of the investigation before filling out the survey form. Nevertheless, study was completely based on a willing participating random population residing in the Punjab.

3. Results and discussion
3.1. Results

Most of the participants were educated individuals from different career backgrounds who could understand a few scientific terms and the English language very well. A total of 323 individuals willingly participated in this study, and their responses were gathered. The demographic features are summarized in Table (1). Most participation was from males aged 17-30 (63.3%, 609%), and employed (62%) from rural areas (59.4%). Table 2. Indicates the questions based on knowledge, awareness, and practice for daily life habits which reflects people's general behavior towards self-treatment irrespective of COVID-19. About 71.2% population knew about self-medication, and 34.7% chose this as an acceptable practice with self-treatment & perception to control Coronavirus at home were 49.2% and 42.1% respectively. Individuals who vigilantly read package insert of medicines before use were 39.6%, and those who always changed medicine during the course were 35%.

Those with adverse effects after self-medication were 24.4%, without adverse effects 6.8% and 38.4% were not sure. A major contributing factor to self-medication was friends/family opinion (28.8%). However, personal convenience (27.8%), unreachable to medical centers (24.4%), no transportation (24.8%), or tough job (20.2%) are also considerable factors. The principal source of seeking health information remains the prescribing doctor/pharmacist (40%). About 53% of respondents reported the anticipated increasing self-medication practices due to Covid-19, whereas 33% reported no change (Table 2). The figure 1 states the frequency of most to least utilized medicine for general illness where Panadol (52%) is the highest followed by Ibuprofen (31.5%), arinac (24.8%) and least used were Hydroxychloroquine (8.9%) and aspirin/acetylsalicylic acid (5.3%). As for antibiotics, Levofloxacin and ciprofloxacin were utilized as 15.9% and 14.6% respectively, and 15.2% for an anti-allergic.

Similarly, the complaints or ailments for which self-medication was performed are given in Fig. 2 where fever/body ache was the most prominent (42.1%), followed by vomit/nausea (32.5%), cough/sore throat & low/high BP both were 28.1%. Multiple choices could be selected under this category. The least frequency is shown by frequent muscular tension (16.9%). The concept of using herbal or natural products is ubiquitous in Pakistan with the perception of being immunity boosters (43%) in all general or particular diseases (28.8%), bacterial/viral infections (19.5%), and also as part of their daily diet (18.3%) given by fig.3. About 44% people considered eating fruits & vegetables as the effective measures against Covid-19 and 40 % chose SOP implementation. Similarly, a significant no. of individuals reported having multivitamins 31.5%, senna leaves 37.2%, mixed herbal tea 25.8%, Vit D & C supplements 30% and using NSAIDs 29.7%. This practice has become a part of respondents' daily diet during the pandemic situation.
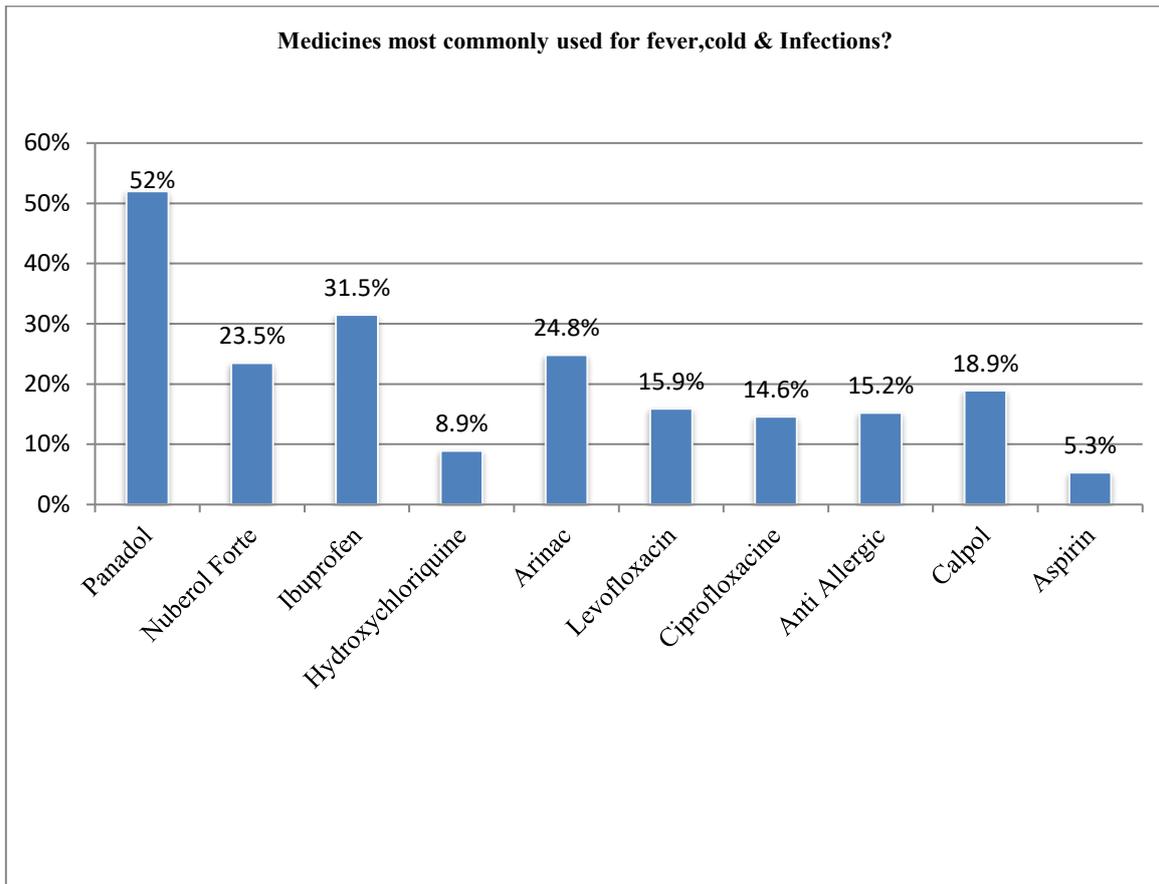
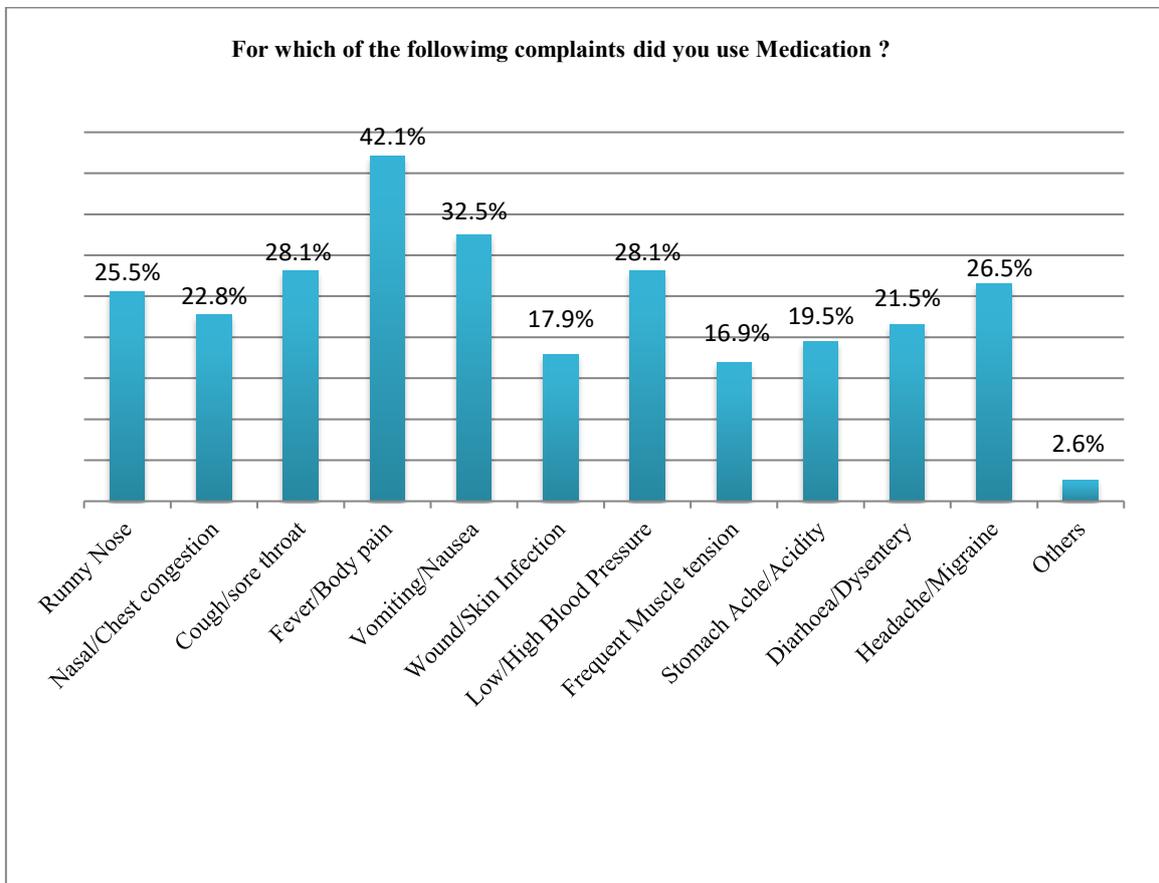**Figure 1:** Graphical presentation of medicine utilization by respondents

Figure 2: Graphical presentation of medicine utilization for different ailments

What did you herbal products used for ?

To increase immunity — 43.0%
As a part of daily diet — 18.3%
All diseases — 28.8%
Allergic Infection — 19.5%
Bacterial/Viral infection — 19.5%

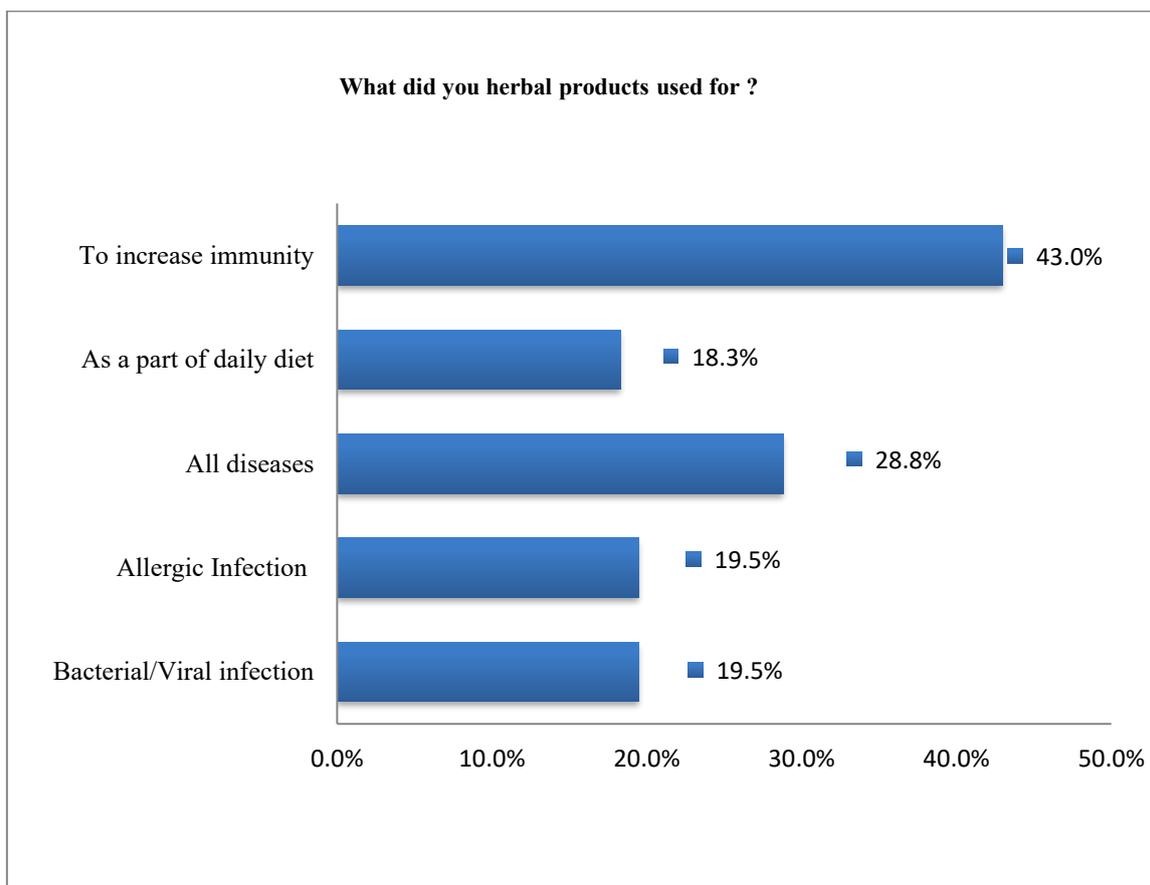(x-axis: 0.0%, 10.0%, 20.0%, 30.0%, 40.0%, 50.0%)

Figure 3: Graphical presentation of herbal products utilization by respondents

Table 1: Demographic characteristics of study respondents (n= 323).

Demographic Features		Frequency	Percentage	p-value
Gender	Male	195	60.9%	0.704
	Female	128	40.1%	
Age groups (years)	17-30	207	63.3%	0.703
	31-45	82	26.6%	
	>45	34	10.2%	
Job status	Employed	200	62%	<0.001
	Unemployed	123	38%	
Education level	High school	51	16%	<0.001
	Bachelors	177	55%	
	Masters	90	28%	
	Doctorate	05	01%	
Marital Status	Married	164	50.7%	0.019
	Unmarried	167	49.3%	
Geographical area	Rural	192	59.4%	0.108
	Urban	56	17.3%	
	Peri-urban	75	23.3%	
Religion	Islam	182	54.9%	<0.001
	Christianity	56	18.8%	
	Other	85	26.3%	

Chi-square test was conducted to find the p-value and its significant ≤ 0.05

Table 2: Variables to assess KAP findings of respondents (n= 323).

Variables		Frequency	Percentage	p-value
Do you know what Self-Medication is?	Yes	230	71.2%	<0.001
	No	47	14.6%	
	Not sure	46	14.2%	
What do you think about Self-Medication for self-health care?	Good	114	35.3%	0.028
	Acceptable	112	34.7%	
	Not Acceptable	97	30%	
Can you treat common infections successfully by yourself?	Yes	159	49.2%	<0.001
	No	59	18.3%	
	Not sure	105	32.5%	
Can you control Corona virus disease with self-medication at home?	Yes	136	42.1%	0.318
	No	84	26%	
	Not sure	103	31.9%	
Do you read instructions come with the package insert of medication?	Yes	128	39.6%	0.009
	No	51	16.4%	
	Sometimes	142	44%	
Have you ever experienced adverse effect with Self-medication?	Yes	80	24.4%	0.980
	No	119	36.8%	
	Not sure	124	38.4%	
Do you switch antibiotics during course of Self-medication?	Yes, always	113	35%	0.918
	No, never	151	46.7%	
	Sometimes	59	18.3%	
Various reasons for self-medication	Consultation cost saving	61	18.9%	0.098
	Convenience	90	27.8%	
	Lack of trust in a prescribing doctor	49	15.2%	
	Friends/family opinion	93	28.8%	
	Tough job	65	20.2%	
	Unreachable to medical services	79	24.4%	
	No transportation means	80	24.8%	
How do you mainly obtain health information	Social media/internet	123	38%	0.087
	TV ads/ Newspaper	39	12%	
	Doctor/Pharmacist	129	40%	
	Family/Friends	32	10%	
Has the pandemic outbreak changed your self-medication practice in any way?	Increased	171	53%	0.09
	Decreased	45	14%	
	No change	107	33%	
Effective measures to maintain health & avoid getting Coronavirus?	Eating fruits & vegetables	142	44%	0.002
	Following SOPS for Covid-19	129	40%	
	Multivitamins	102	31.5%	
	Mixed herbal tea	83	25.8%	
	NSAIDs	96	29.7%	
	Vitamin D & C	97	30%	
The trend of natural/herbal products usage during COVID-19	Using Antibiotics	79	24.5%	
	Herbal tea	207	64.2%	
	Garlic juice	128	39.5%	
	Honey & Lemon	238	73.8%	
	Black cumin	124	38.5%	0.091
	Lemon Grass	99	69.3%	
	Olive/coconut oil	102	31.5%	
	Cassia *angustifolia Vahl*. (Senna Leaves)	120	37.2%	

Chi-square test was conducted to find the p-value and is significant ≤ 0.05

Table 3: Comparison of respondents' attitudes towards health before and during COVID-19

Variables	Before Covid-19	During Covid-19	Both Before and during Covid-19	p-value
Have you treated yourself with medication without prescribing it?	16%(n=53)	27%(n=87)	57% (n=186)	0.03
Did you take medication for physical/cognitive performance?	6.5%(n=21)	19.1%(n=87)	24.7%(n=92)	0.01
When were you more conscious about your health status?	15%	32%	48%	0.09

Chi-square test was conducted to find the p-value and is significant ≤ 0.05

Specific natural products they utilized include lemon & honey (73.8%), lemon grass (69.3%), herbal tea (64.2%), garlic juice (39.5%), black cumin water (38.5%), and coconut/olive oil (31.5%) given in table 2. Table 3 shows a comparative ratio of self-medication before & during Covid-19. In our study, 57.2% of individuals were in general habit of self-prescribing before & during the pandemic, 27% started using only during the pandemic while enhancing physical/cognitive performance 24.1% both are significantly correlated respectively (p=0.03 & 0.01). It was seen that respondents have become more conscious about their health status (32%) during Covid-19 and the overall ratio was 48% both before and during pandemic with a significance of 0.03.

3.2. Discussion

WHO and the International Pharmaceutical Federation have attested to the responsible use of self-medication whenever utilized wisely to treat and prevent sickness in such a way that the probable risks can be avoided [13]. In our study, 57% of respondents used medicines without a prescription, and 53% reported increasing practice during Covid-19. Easy availability, cost, friends/family opinions, lack of transportation to the health clinic were all major reasons for self-medication similar to as reported by Nasir et al., 2020 [14]. Another study depicted significantly higher frequency (88%) of self-medication discussed by (97 %) of the respondents. Self-medication was practiced by 57 % of responders during COVID 19 pandemic which is similar to our study results [15]. However, Makowska *et al.*, 2020 reported diminished practices during lockdown, where 16.9% of Rx drugs were consumed without consultation and 16.6% as protection from getting sick, 17.9% used lifestyle prescription meds for enhanced cognitive activity comparable to our study as 19.1% during lockdown [16]. Soon after Coronavirus disease declared a pandemic, in October 2021, the global crisis has affected 242 million people and caused about 4.9 million lives [17].

With the escalation, many drugs that were presented earlier as powerful candidates were later ultimately declared to have very little to no benefit; even adverse effects such as hydroxychloroquine or azithromycin [18] failed to display any clinical effects validated by recovery & solidarity trial in Corona disease [19]. However, some well-designed studies have elaborated potential benefits of vitamin supplements but not in the management of COVID-19 [20]. Our study reported a group with the adverse effects of medications (24.4%) which is a matter of great concern in terms of antibiotic resistance, risk of bleeding triggered by aspirin, reduced immunity due to corticosteroids, or arrhythmia caused by using hydroxychloroquine [21]. In addition to these

medications, an increase in the use of herbal and homeopathic remedies has been noticed. The literature states that a population's perspectives and behaviors are highly influenced by media reports [22] and because of the enormous media updates about the ongoing pandemic, about 38% of respondents' sources of seeking healthcare information were social media/internet and 12% relied on TV ads. A study by Sehar-un-Nisa et al., 2020 stated 65% ratio of obtaining information from prints & electronic media [23].

In this situation, several researchers have already performed clinical trials using herbal medicines to fight SARS-COV-2. The use of Sana Makki leaves/tea in COVID-19 began on this foundation. There have been several media stories disseminated in Pakistan on utilization of *Cassia angustifolia Vahl*, (Senna Makki) alone or mixed herbs tea for reduction and management of Covid-19 disease. Our study findings showed 37.2% users of Senna leaves alone and 62.2% as mixed herbs. Nonetheless, consumption was unproven scientifically as this is used as a laxative which could lead to electrolyte imbalance or diarrhea and even worsen condition of COVID-19-positive patients [24]. A study by Ahmed *et al*, (2020) from Bangladesh reported similar results of 57.6% herbal foods/products consumption combined with arsenicum album, multivitamins, and zinc being most commonly used preventive medicines along with the paracetamol, antiallergic and antibiotics with significant no. of unsuitable drugs utilization [7]. Although use of natural/herbal products and Ayurveda is popular since ancient times in Chinese medicine and while many efforts were being aimed at finding potent therapeutic candidate, experimenting with herbal medicines combined with antiviral drugs has been thought to be an effective remedy against SARS-CoV-2.

Panyod *et al*., 2020 combined past literature favoring dietary and herbal therapy as an operative way against SARS-CoV-2 and COVID-19. Utilization of ginger, Eucalyptus, cape spider lily, Cape jasmine, fish mint, tea tree, Korean ginseng, honey, ningxia & hunan, garlic, etc in diet/supplements was reported beneficial for acquiring strong immunity [25]. Vitamin C, unlike hydroxychloroquine, is not a regulated substance that may be purchased in a pharmacy. Vitamin C & D utilized by about a third of the population in our study (30%), honey & lemon 71.8%, garlic juice 37.5%, & black cumin (*Nigella sativa*) 36.5%. Pakistani population uses natural remedies to manage multiple issues with great conviction; however, an ambiguity regarding effectiveness against Coronavirus is still a question. Mirza et al., 2020, concluded that 85.2% of respondents believe that using "kalonji" (*Nigella sativa* L. seed) might have a precautionary effect since antioxidant & other highly predominant benefits of these seeds have already been documented in literature

[26]. Given overall health implications of Corona outbreak, it is critical to identify and comprehend elements that influence perceived risks, fear, and reliability of people's views and compliance with preventative health measures [27].

4. Conclusion

Self-medication could be unhealthy and lead to serious health problems if not administered according to established guidelines. A comparison of various nations' information, attitudes, and behaviors can offer a more comprehensive summary of the circumstances and better-tailored health guidelines. In this way, identifying the incorrect theories that prevailed in the general population can be addressed and health campaigns by the government and media outlets can be planned accordingly.

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