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Original Research

Self-medication Practices and Associated Factors among COVID-19 Recovered Patients to Prevent Future Infections: A Web-based Survey in Bangladesh

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ABSTRACT

Background: Human health is largely affected by self-medication in both ways, adversely and favorably, as evidenced by the COVID-19 pandemic. The fear of spreading novel coronavirus disease (COVID-19) from health workers and hospital environments has led many Bangladeshi people to practice self-medicate for as the preventive strategy against this disease. Consequently, this practice entails an improper and injudicious use of medicine to cure self-recognized symptoms. To date, the COVID-19 has no effective treatment. The lack of a cure for COVID-19 and the continual progression of the diseases in educational settings induce a substantial population to practice self-medication. Therefore, a study of self-medication practices is necessary for the framework of the pandemic. This study aimed to estimate the prevalence and factors associated with self-medication to prevent or manage future COVID-19 infections among recovered COVID-19 patients. **Methods**: This cross-sectional study was conducted since September 2020 to February 2021 using an e-survey along with 360 participants (>18 years). Data were collected using a pre-tested self-reported questionnaire. Descriptive statistics and correlations analysis were performed in the study. **Results**: Among 360 (male 69.7% and female 30.3%) participants, the prevalence of self-medication is 11%, and monthly family income, residence, education, occupation, and previous history of SM are the associated factors. Among the participants, 29.7% use antibiotics, and 30% use herbal products/drugs as medication. **Conclusion**: The present study found SMP is moderately prevalent among COVID-19 recovered patients. To minimize the rate of SMP, adequate health care–access systems and public education should be introduced, and media and community should be engaged in rational use of medication.

Key words: COVID-19 pandemic, COVID-19 recovered patients, self-medication, risk factor, antibiotic, mental trauma

INTRODUCTION

The COVID-19 pandemic has sparked a global lockdown, leaving people with the impression that their[1] only option is self-help, self-care, and self-medication[2]. The pandemic has caused extreme anxiety and fear among the Bangladeshi people owing to an increase in confirmed cases as well as the high fatality rate in the South-Asian region, exacerbated by the fact that there is no approved vaccine or medication for its treatment. As a result, many people, particularly those who are feeling ill, have turned to the consumption of various drugs, including traditional medicines, to treat or prevent a perceived COVID-19 infection without considering the safety and efficacy of said attempted cure in relation to the human body[2]. Practicing home remedies through the use f herbal foods/medicine as a preventive measure against COVID-19 has also been seen in this country[3]. However, a lack of swift response, the shortage of hospital beds, a lack of medical clinics, insufficient test capability (qRT-PCR), and the proliferation of unauthenticated treatment procedures has placed people in a dilemma when needing to choose professional care[4].

People who are seeking suitable measures to fight the virus, especially people who have already developed some symptoms similar to COVID-19 or recovered from it, may get influenced by the COVID-19 related 'infodemic'. Additionally, a substantial number of recovered COVID-19 patients keep practicing their treatments to prevent or manage future infections with the same medicine they used to treat themselves earlier or that are known to be effective at preventing COVID-19[5]. Consequently, the practice of

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self-medication among the general public is increasing[6]. In low or middle-income countries, including Bangladesh, the incidence of self-medication may be greater without consultation with trained healthcare professionals[7].

Self-medication (SM), as defined by the WHO, refers to the selection and use of medicines to treat self-recognized symptoms or disorders without consulting a doctor[8]. Also, the use or reuse of previously prescribed or unused medications, direct drug purchases without consultation, and inappropriate medication of over-the-counter (OTC) drugs are often included[9]. SM is a significant global problem affecting developing and developed countries[10]. Different studies show that SM is a widespread practice with a worldwide prevalence of 32.5 – 81.5%[11]. SM is a widespread but dangerous approach to the management of illnesses that can lead to severe illness, delays in the diagnosis of medical disorders, or an enhanced risk of complications[12]. The probable reason for extravagance in terms of SM in this country includes past treatment experience with the same symptoms, ready drug availability, halted accessibility to healthcare facilities, socio-cultural or religious values, comparatively high hospital treatment rates, suggestions from friends/family/media[7], ignorant behavior, and poverty. In addition, the doctor-patient ratio in Bangladesh is currently low which puts the country second from the bottom among the South Asian countries for this factor, according to the WHO[13]. The socio-economic disparity among people and the feeling of helplessness during the pandemic has further increased the unequal access to healthcare since early 2020[14]. Due to the frequent symptoms of pain or soreness of the throat, a dry cough, severe headache, fever, fatigue, muscle aches, and breathlessness, people have started taking medication without a COVID-19 diagnosis or tests[7]. Moreover, people diagnosed with COVID-19 are also doing so during the early stages of COVID-19, hoping that the symptoms will not develop into severe illness. Furthermore, individuals who have recovered from it have also demonstrated the practice of self-medication to mitigate post-COVID-19 complications.

However, the arbitrary use of medication can involve several risks and side effects, including poisoning, misdiagnosis, medication errors (ME)[15], adverse drug reactions[16], endorsed drug addiction, drug toxicity, increased pathogen resistance[12], potentially life-threatening adverse effects, inappropriate dosage, and unreasonable drug use which may lead to death[17]. Although 0.1% of self-medication-related complications will be high in number, this will be challenging to deal with for the current healthcare system, which is currently battling COVID-19.

However, researchers have anticipated that the practice of SM among COVID-19 infected and recovered patients, as well as people en-masse, will be substantially high following the pandemic[18]. Therefore, the present study aimed to investigate the prevalence and associated factors of self-medication practices among COVID-19 recovered patients who seek to prevent or manage future infections.

METHODS

Study design, participants, and procedure

A cross-sectional e-survey was conducted from September 2020 to February 2021. A purposive sampling technique was utilized in this study. It took each participant about 10 – 12 minutes to complete the entire survey. At first, 402 people took part. After deleting incomplete responses and participants who replied but who had not been infected with COVID-19, 360 responses were included in the final analysis. A self-reported questionnaire developed in Bangla (the participant's native language) was utilized to collect data during this study. Following the completion of all questions in the Google Form, a shareable link was provided. The survey link was shared on several community-based online forums to elicit replies from individuals who had recovered from COVID-19.

A pilot test was conducted with 35 participants within the same population (target group) to check the questionnaire's acceptability, validity, and transparency before moving on to the next phase. Minor changes were made to the questionnaire after the pilot testing. The questions with responses were not included in the final analysis. An informed consent statement outlining the purpose and process and the right to refuse participation in the study was attached to the first page of the questionnaire. Individuals were requested to obtain written informed permission before being asked, "Are you willing to take part in this study voluntarily and spontaneously?" A blank survey form was automatically submitted if the person replied 'No'. If the person replied 'Yes,' he/she was allowed access to the full form of the survey. In this study, the exclusion criteria for participation were individuals below 18 years old, no COVID-19 infection confirmation, and severe psychological problems (as this can cause memory biases).

Measures

Socio-demographic measures and the determinants of self-medication

In the present study, socio-demographic information was collected by asking questions about sex (male/female), age (younger adults > 18 – 39 years, middle-aged > 40 years), residence (rural/urban), occupation (unemployed/employed), education (tertiary/equal or below secondary), and smoking habit (yes/no). Depending on the monthly total family income in Bangladeshi Taka (BDT), socioeconomic status (SES) was divided into three classes: lower SES [15,000 BDT], medium SES [15000 – 300,000 BDT], and upper SES [> 30,000 BDT] [19].

Self-medication related questions

The measures related to self-medication were obtained from previous studies (2), (20) as well as by asking the following questions: *"What was your action after identifying the symptoms of COVID-19?"* (Waiting for cure/ Consulting with doctor/ Self-medication), *"Do you have healthcare professionals among your family members?"* (yes/no), *"Do you have a previous history of self-medication?"* (yes/no), *"Do you think self-medication is harmful?"* (yes/no), *"Prescription of medication given by?"* (Myself/Physician/Specialist), *"Knowledge of self-medication?"* (Sufficient/Insufficient), *"Self-medicating medicine?"* (Antibiotic/ Doxycycline/ Dexamethasone/ Ivermectin/Favipiravir), *"Do you use Herbal products/drugs for treatment?"* (Yes/No), and *"What was your reason for practicing self-medication?"* (Familiar medicine/ Mild symptoms/ To save time/Readily available/ To get a quick result/Financial crisis).

Statistical analysis

Microsoft Excel 2019 and IBM SPSS Statistics version 25 were used to analyze the data. Microsoft Excel was used to clean, code, and sort the data. The SPSS software was used to examine the descriptive statistics (*e.g.*, frequencies, percentages, means, standard deviations, and so on). For the regression analysis, a p-value of less than 0.05 was considered significant.

RESULTS

Socio-demographic characteristics

A total of 360 participants were included in the final analysis. Among them, 69.7% were male and 30.3% were female. The majority of the participants were younger adults (> 18 – 39 years) (58.1%), and middle-aged (> 40). The majority of the participants (84.7%) were unemployed, about 74.4% of the participants had completed secondary level education, and among the participants, a substantial proportion (60.3%) have a smoking habit. Most of the participants were of the middle socioeconomic status (41.9%) and resided in urban areas (71.9%). Among the participants, 32.5% took the COVID-19 test after identifying the symptoms of COVID-19, 31.7% consulted with doctors, and only 23.9% of the participants waited for a cure. The majority of the participants (61.9%) had no family members in the healthcare profession. Half of the participants (51.1%) had never self-medicated before, and the majority (71.7%) believe that self-medication is harmful. The majority of the respondents (30.6%) took paracetamol, and antibiotics (29.7%) to treat their symptoms, and 70% of the respondents didn't take any herbal products/drugs for their treatment.

Factors affecting self-medication

Self-medication was found to be strongly associated with the participants' residence in this study. People living in rural areas (17.8%) scored as having a significantly higher rate of self-medication than people in urban areas, and only 9.7% of urban participants practiced SM. Age and sex were not significantly associated with self-medication. A previous history of self-medication was found to be significantly associated with self-medication. Respondents with a prior self-medication history (21.0%) scored higher than the respondents with no self-medication history. Moreover, 90.3% of the respondents believe that self-medication is harmful to their health and didn't self-medicate, while 17.6% of the respondents believe that self-medication is not harmful to health and continued self-medicating themselves. About 83.6% of the respondents practice self-medication based on their own decision, and a large proportion (58.6%) of participants have sufficient self-medication-related knowledge. The main cause of self-medication was being a familiar medicine used for previous diseases (35.3%). Among the participants, (15.7%) used herbal medicine as an alternative medicine, and (35.3%) practice it as the medicine was familiar to them due to previous use, while (12.5%) used it to get quick results.

DISCUSSION

The purpose of this study was to estimate the prevalence, causes, and determinants of self-medication practices for COVID-19 prevention and/or treatment in Bangladesh. Although the World Health Organization (WHO) recommends self-medication for minor illnesses [20], our study looked into self-medication for

perceived COVID-19 prevention/treatment. To the best of our knowledge, this is the first study on the objective of COVID-19-related self-medication practices among recovered COVID-19 patients, although there have been previous studies on self-medication practices connected to diseases other than COVID-19 in Bangladesh and elsewhere.

People have long been concerned with their health and have practiced self-medication since ancient times. Although there are numerous advantages and disadvantages to practicing self-medication, it all relies on who uses it and how it is utilized for self-treatment. While this is undeniable, self-medication without consulting with a certified health professional may be more common in low- and middle-income countries. SMP is common in most sections of Bangladesh regardless of socioeconomic class or educational attainment[7]. SM may be a low-cost way for people in impoverished countries like Bangladesh to avoid the high expense of clinical services. Many medications are available over the counter (OTC) without a prescription[21]. However, to the best of the author's knowledge, there is no current evidence on the prevalence of SMP among COVID-19 recovered patients in Bangladesh. In addition, there is a dearth of knowledge globally regarding this issue.

However, in this study, we focused on self-medication practices among COVID-19 recovered patients in Bangladesh to estimate the prevalence of self-medication practices and the factors associated with them. This study found that 11% engage in self-medication practices among recovered COVID-19 patients which is much less than a couple of studies previously conducted in Bangladesh among general populations[7,12], among rural and urban people in India[22,23], among general populations in Pakistan[24], among general residents in China[25], among health science students in Iran[26], and among the parents of school students in Italy[27]. The prevalence is less than those studies may be because of the different study settings, time, and target groups. Additionally, the present study conducted was among the recovered COVID-19 patients who practiced SM to prevent or manage future infections. This could be another significant cause of low prevalence. As this study was conducted among recovered COVID-19 patients, the patients are exceptionally concerned regarding the disease and many are afraid of practicing SM. Moreover, there was no effective treatment discovered to be practiced which could be another reason.

However, according to this study, self-medication practices (SMP) have been found to be significantly associated with a person's residence, and the prevalence of SMP is higher among people living in rural areas than people living in urban areas. This is in contrast to a study in Ethiopia that revealed that living in a city was strongly associated with self-medication[28]. SMP was shown to be more common among those living in large cities in a similar study in Spain[29]. Another study in the rural parts of Portugal found a 21.5% prevalence of SMP among rural people[30]. This may be due to the lower literacy level among individuals living in rural areas. A study found that Bangladesh, as one of the world's poorest countries, has extremely low educational attainment, especially among women[31]. Only 9% of boys and 5% of girls finish high school[31] in rural areas. This may be a cause of self-medication as a previous study found there to be a significant association between a father's education and self-medication[32]. People living in rural areas might have to travel long distances and pay a lot of money to visit a doctor[33], The majority of Bangladesh's rural areas lack a sufficient number of dispensaries, and those that do exist are ineffective due to a shortage of medical personnel and medications during the pandemic. SMP is found among people in lower socioeconomic status in this present study which is in line with a previous study in Tamil Nadu[34]. According to this study, unemployment was found to be significantly associated with self-medication. In contrast to the study in Tamil Nadu, employed participants had a higher rate of self-medication[34]. Many residents in rural districts rely on daily wages to supplement their income because they commute to the city every day but due to COVID-19 lockdown, thousands of people lost their jobs and suffered from a financial crisis when consulting a doctor because of the high cost of medical consultations[35,36]. These factors may also lead low socioeconomic status people to resorting to self-medication.

Tertiary education, or university graduates, have been found to be significantly associated with self-medication. According to a prior study conducted on adolescents, those with lower medical literacy are more prone to participate in inappropriate self-medication[37]. Another reason could be that educated people are more confident about the effects of medicines and practice it randomly as they believe this will be less harmful. Nonetheless, people who are sick frequently treat themselves, which is likely owing to the human survival instinct. People act on their health every day, all across the world, without consulting competent medical professionals. They make it a habit and a culture to take care of themselves.

However, the present study found that SMP was significantly associated with a previous history of self-medication and it is higher among people who have suffered from the same illness previously. According to a previous study among Bangladeshi students, the largest proportion (38%) of students learned self-medication from an old doctor's prescription to treat a present illness[38]. Prior studies in the same country found that previous prescriptions were the most important source of information and the most important factor of self-medication[39]. The pre-experience was one of the main causes for the self-medication of antibiotics[40]. The finding that the majority of respondents got information regarding self-medication from previously prescribed medicines by doctors is consistent with the research conducted among Brazilian universities[41]. Inappropriate SMP can result from misplaced confidence, and individuals may be exposed to all of the risks associated with self-medication. According to studies conducted in the United States, Asia, and Europe, 22 — 70% of parents have misconceptions regarding the proper usage and efficacy of antibiotics[40]. However, other factors, such as the opinions of family members, friends, neighbors, and advertisements, may have impacted the responders[39]. The fact that such a large percentage of people self-medicate on their initiative highlights the necessity for healthcare practitioners to launch an intensive public awareness campaign about the dangers of self-medication. A further longitudinal study is needed to properly determine the association between self-medication and history of illness.

In addition, in this study, we found that the majority of the participants were aware of the dangerous effects of self-medication. According to a previous study conducted in the UAE, the majority of respondents (64.1%) considered self-medication to be safe[39]. Another survey found that 47% of participants believe that self-medication is a form of self-care that should be encouraged[22] which aligns with the other studies in Ethiopia and Karachi[24,42]. According to a telephone survey in the USA, 58% of people were unaware of the potential health risks associated with antibiotic use[43].

SMP has been found to be significantly associated with the knowledge of an individual regarding the prescription of medication. In contrast to a prior study among adolescents, participants with lower medication awareness were more prone to engage in inappropriate self-medication[37].

However, there are several advantages to appropriate self-medication, including rising patient access to medication and relief, the patient's prominent participation in the care of their health, improved use of the physician and pharmacists' skills, and lowered (or at least optimized) government burden due to the health expenditure in the pandemic associated with the treatment of minor health conditions[44]. However, self-medication, on the other hand, is far from being a perfectly safe activity, especially in the event of irresponsible self-medication. Erroneous self-diagnosis, postponement in seeking medical advice when needed, occasional but severe adverse reactions, dangerous drug interactions, incorrect method of administration, wrong medication, inappropriate preference of treatment, masking of severe disease, and the risk of dependence and abuse are all potential risks of self-medication[44]. Government officials should keep a careful eye on the rules and regulations governing the sale of pharmaceuticals from pharmacies. To adequately educate people about the adverse effects of self-medication, a holistic approach should be used, including sufficient awareness and education on self-medication and stricter regulations for pharmaceutical advertising. These programs might be conducted online due to pandemic-related restrictions.

The World Health Organization (WHO) and epidemiologists from many countries have anticipated that the COVID-19 pandemic will last for years and have a significant socioeconomic and psychosocial influence on people's lifestyles and behavior. Without appropriate scientific proof, a variety of medicines have been utilized to treat respiratory and COVID-19-related symptoms. Antibiotics and paracetamol were the most commonly used pharmaceuticals, while Doxycycline, Dexamethasone, Ivermectin, Favipiravir, and even traditional treatments have been widely used. They have been used as COVID-19 preventives to treat suspected symptoms, even after a positive COVID-19 diagnosis. This study may provide information to health educators, planners, and other health professionals that will aid in the reduction of SM and the promotion of positive and responsible use of medicine. A comprehensive nationwide survey and surveillance of a large population for self-medication should be conducted to safeguard them from potential hazards, overuse shortages, and unjustified financial engagement during the COVID-19 outbreak.

Limitations

There is no study that works completely outside of constraints, and this study has some limitations as

well. Firstly, the study was cross-sectional in its nature, therefore the causality of factors could not be established. In this regard, a longitudinal study is required to better understand the practice of self-medication among recovered COVID-19 patients. Secondly, this study employed an online-based self-reporting method which could have been influenced by a variety of biases, including perceived benefits and episodic memory biases. Thirdly, due to the inflexibility of reaching out to persons who have recovered from COVID-19 and their refusal to engage in this study freely, the study enrolled only a few participants.

CONCLUSIONS

SMP has become a significant public health concern in Bangladesh, particularly during the COVID-19 pandemic. This study revealed a considerable number of recovered COVID-19 patients who practice self-medication to prevent or manage the future occurrence of COVID-19. One in every eleven participants who has recovered from COVID-19 practice self-medication. It is necessary to maintain a constant knowledge and sensitization about the dangers of self-medication. Our findings should be viewed with caution and should not be construed as a piece of advice to self-medicate or to use these medications in the hope of improving symptomatology. Before taking any medication, always seek medical advice via a consultation. We anticipate that these findings will help healthcare policymakers make better decisions about how to improve pharmaceutical care and save lives.

ABBREVIATIONS

None.

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AUTHOR'S CONTRIBUTIONS

Conceptualization: MSHS, AH, RT, MSI, Methodology: MSHS, MSI, Formal Analysis: MSHS, MSI, Validation: MSHS, AH,RT, MSI, SMS, MMH, MRU, Investigation & Writing Original Draft: MSHS, AH,RT, MSI, SMS, Data Curation: MSHS, Review & Editing: SMS, MMH, MRU. All authors have read and agreed to the published this version of the manuscript.

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AVAILABILITY OF DATA AND MATERIALS

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was conducted following the Institutional Research Ethics and Human Involvement Guidelines (Helsinki declaration). The Ethical Review Committee gave their approval for the study. Formal ethical approval was granted from Ethical Review Committee, Jahangirnagar University [BBEC, JU/M/ COVID-19(7)4]. The purpose of this study, as well as i) the methods and objectives of the current investigation, ii) data confidentiality and anonymity, and iii) the flexibility to withdraw response from the study at any moment, were all documented in the first phase of the questionnaire.

CONSENT FOR PUBLICATION

Not applicable.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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