

Effect of COVID-19 Pandemic on Patient Adherence to Chronic Medications in Sudan in 2021

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Abstract

Background: As the coronavirus spread accelerated, various sectors began to deteriorate since the early stages of the COVID-19 pandemic. The health sector as one of the major areas where the pandemic put a huge strain was also affected in different ways. Precisely, patient adherence to medication despite difficulties was a point of a question for health staff. Thus, this survey aims to distinguish and discuss the possibility of patients with chronic medications receiving their drugs and taking them regularly as prescribed. **Method:** Two online questionnaires were generated using Google forms and distributed among patients with chronic illnesses and pharmacists in the Khartoum locality. The survey was conducted during the period of the study to get the most recent data. **Results:** 81.4% of the population stated that they did encounter difficulties in obtaining their chronic medication during the pandemic. Pharmacists reported that drug availability decreased by 87% in pharmacies, but a considerable proportion of patients adhered to their medications (84%), and obtained their medications through a variety of means. More than half of the patients ordered their medication illegally, in addition to another approach discussed in the paper.

Keywords

COVID-19, Sudan, Adherence, Patient, Pharmacist

1. Introduction

In December 2019, an unknown outbreak of pneumonia was reported in Wuhan, Hubei Province, China. Later a cosmopolitan spread of this pneumonia was

found to be SARS-CoV-2 which resulted in thousands of deaths, which promoted the World Health Organization to announce a pandemic on 12 March 2020. Up till now, humanity paid dearly for it in regard to a large number of humans who lost their lives. Moreover, economic changes came out as a consequence of the pandemic, represented in poverty, health issues, and psychological issues for instance [1]. Social distancing and lockdowns were enforced by various societies as a prevention against coronavirus spread, which also, has had many economic and health impacts in particular [2].

Non-adherence is a crucial point for the efficacy of many therapies. Medication non-adherence is a problem that many developed and developing countries faced [3]. Compliance among patients with acute conditions is higher, as compared with those with chronic conditions; persistence among patients with chronic conditions is disappointingly low which significantly declines after the first six months of starting the treatment [4]. Adherence is a multifactorial phenomenon that can be influenced by various factors. These factors can be divided into five different categories:

- 1) Socioeconomic factors
- 2) Treatment-related factors
- 3) Disease-related factors
- 4) Health care system-related factors
- 5) Patient-related factors.

Some of these factors can affect intentional non-adherence in which a conscious decision not to take the medication is made by the patients (e.g., because of high price) while others can influence on non-intentional non-adherence (e.g., forgetfulness because of mental comorbidity) [3]. In Sudan, there is a marked deficiency in statistics regarding medication adherence to chronic medications due to a lack of local studies, although two researches were conducted among adherence to secondary-prevention medication which indicates a percentage of 66% of patients at Elshaab Hospital in Khartoum were being well adhered to their medications. Another study reveals that 75% of cardiovascular patients adhered perfectly [5]. These studies were done prior to COVID-19 pandemic. After the emergence of COVID-19, many factors contributed to the decrease in adherence of patient's medications which highlighted the importance of conducting more researches in this area. Therefore, this study was conducted to evaluate the effect of COVID-19 on the availability and access to medication that influence the adherence of chronic medications among patients in the Khartoum locality.

2. Methods

A descriptive, quantitative and cross-sectional study was designed to describe the effect of COVID-19 on the adherence of patients to their medications in the Khartoum locality. The study population consists of out-patients with chronic illnesses. In addition, observations of pharmacists in community and hospital pharmacies on drug supply and drug availability were collected. The total num-

ber of participants in this research were 250, 150 patients and 100 pharmacists. Two questionnaires were conducted, in which the first questionnaire was oriented toward patients with chronic diseases and the other filled by pharmacist. The first questionnaire is composed of three main sections. The first section provides information about sociodemographic characteristics of the patient (age, gender, level of education, employment status and source of information individuals usually depend on). Section two consists of questions showing an overview of the medical variables (type of chronic illnesses and medication used). The last section evaluates the struggles faced by patients during the pandemic that decreased medication adherence. The second questionnaire was filled by pharmacists and composes of two main sections. Firstly, questions related to sociodemographic information (age, gender, level of education and, level of experience). Secondly, the effect of COVID-19 on drug availability was discussed throughout the questionnaire.

The distribution of both questionnaires is in two ways: online social media and actual visits to pharmacies and patients. So the questionnaire form prepared in hard and soft copy. Finally, the overall time of the study was about three months to distribute questionnaire, collecting them back and make calculations.

3. Results

Data were collected from patients on chronic medication in the Khartoum locality and the results show that 81% of patients faced a struggle in obtaining their medication during the COVID-19 pandemic (**Figure 1**). Obstacles varied among patients, the majority of patients were unable to obtain their medications due to the unavailability of drugs in pharmacies. 23% of patients agreed that drugs become costly. Despite the lockdown, and difficulties in transportation, only 5.4% couldn't be able to reach the pharmacies (**Figure 2**). So the scarcity of medication is the main reason that patients faced in obtaining their medications during COVID-19 in Sudan.

To overcome problems in getting the medications, more than half of patients participated in research ordered their medication from outside the country. While 13.5% of patients asked their physician to prescribe available medications.

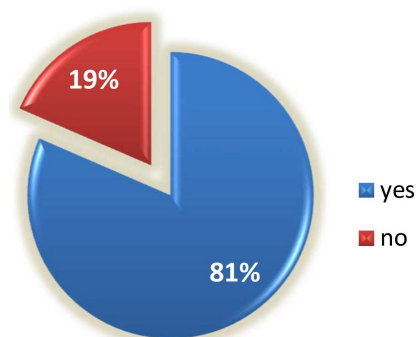


Figure 1. Percentage of people who faced struggles in obtaining medication during the COVID-19 pandemic.

However, 17.6% stopped using medication. And 4.1% started using herbal remedies as an alternative (Figure 3), this resulted in 84% of the patients being adhered to their medicines and 16% stopping their medications (Figure 4). Overall, the percentage of people still facing problems in getting their drugs is 55 which is almost half of the study population (Figure 5).

On the other hand, data was collected from both hospital and community pharmacists regarding the availability of drugs in the pharmacies during the COVID-19 pandemic, 87% agreed that the availability of drugs decreased during that time. While the rest which are the minority noticed no change or increase in drug availability (Figure 6). Approximately 75% pharmacist is considered the major impact in decrease in drug availability is the shortage in drug supply from companies, following by economic issues which is the second highest percentage. Minor percentage of the pharmacist's belief that the diminished drug

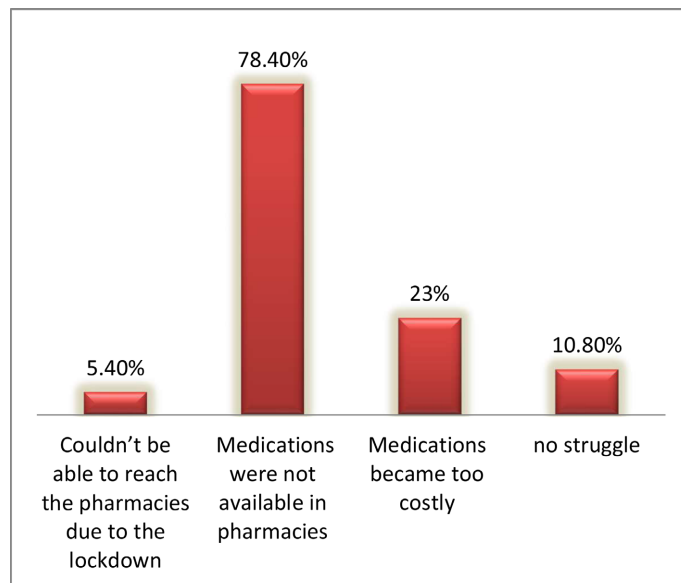


Figure 2. Struggles in obtaining medication during the COVID-19 pandemic.

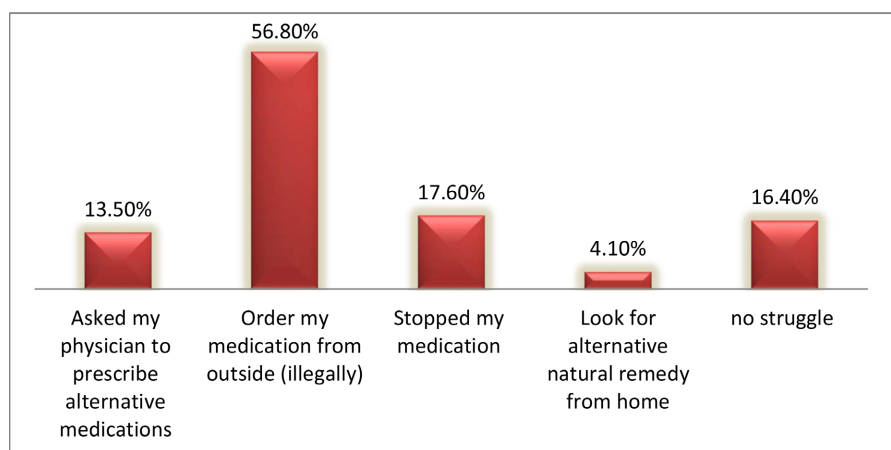


Figure 3. Measures to overcome difficulties in obtaining drugs from pharmacies during the COVID-19 pandemic.

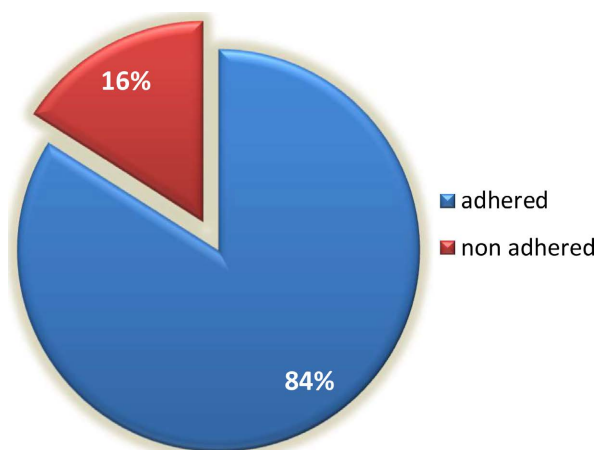


Figure 4. Determining patient adherence to medication during the COVID-19 pandemic.

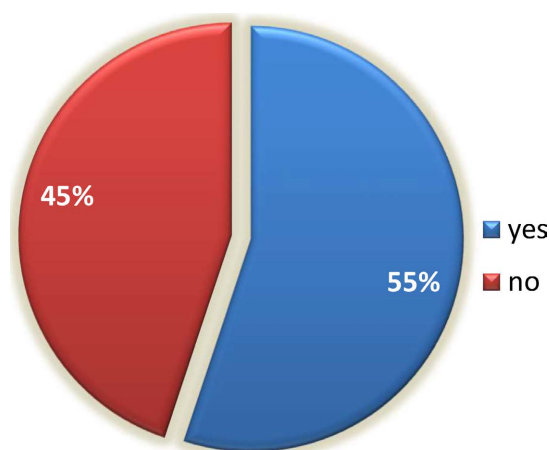


Figure 5. Total percentage of patients who still facing struggles in obtaining chronic medications.

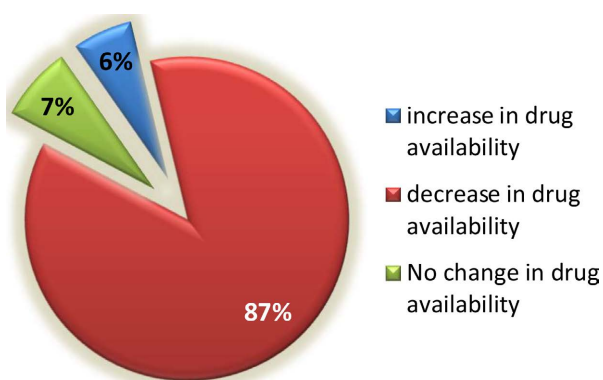


Figure 6. Drug availability in pharmacies during COVID-19 pandemic.

availability was due to irrational purchases by individuals to store in their homes. Only quarter of the pharmacist is of the opinion that reduction in drug production from local factories is the reason (Figure 7). A massive decrease was seen in chronic medications availability (see Figure 8).

Overall, we can see that there is an improvement in people awareness towards

their medications after the pandemic (**Figure 9**). However, there is a massive increase in irrational use of certain medications (**Figure 10**).

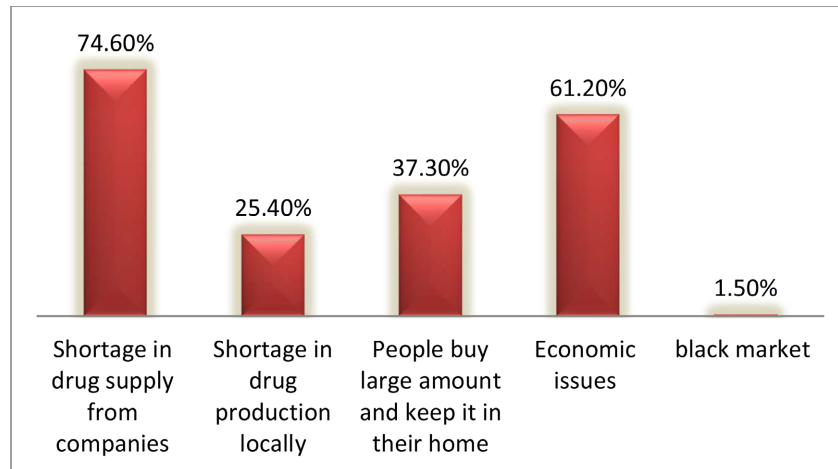


Figure 7. Reasons behind decrease in drug availability in pharmacies during the COVID-19 pandemic.

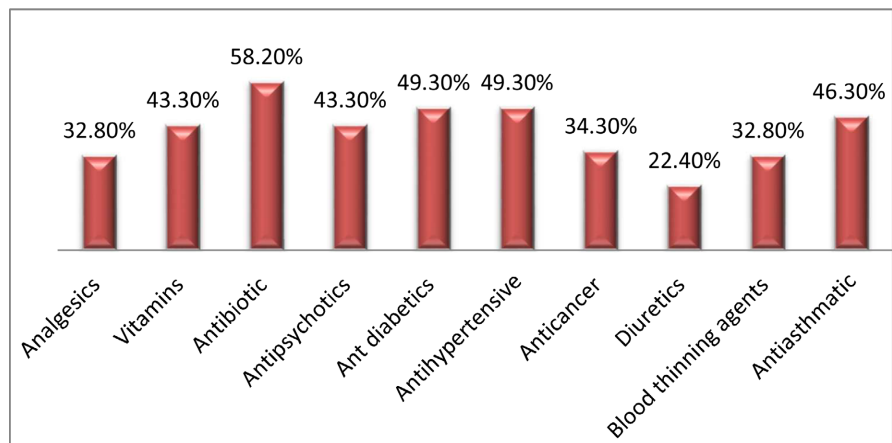


Figure 8. Type of medications decreased in availability in pharmacies during the COVID-19 pandemic.

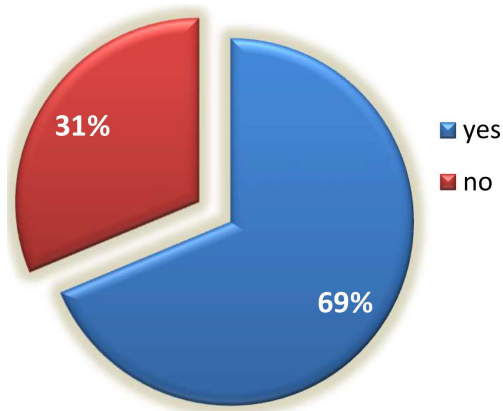


Figure 9. Improvement in people awareness toward their medication after the COVID-19 pandemic.

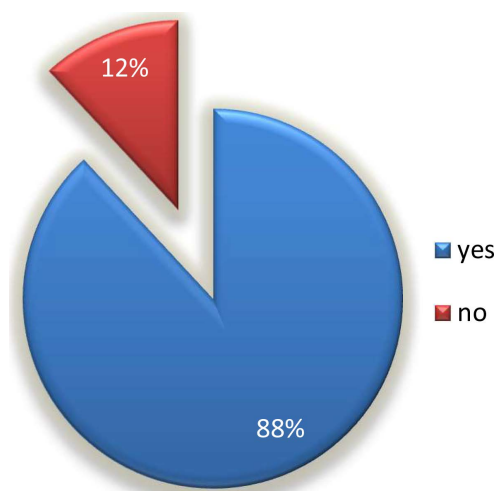


Figure 10. Does the irrational use of certain medication increase during the pandemic?

4. Discussions

Sudan as a developing country, lacks documentation regarding patient's diseases and information with regard to patient adherence. Moreover, deficiency in research in this area; somehow affected the final results. However, the data collected still showed a significant impact of the coronavirus pandemic on patient non-adherence. During the pandemic, numerous patients struggled to obtain their medications. It turned out that the leading cause is the unavailability of medications in pharmacies; this is supported by pharmacist's observation in the study population. This is due to an insufficient supply of drugs and raw materials from abroad.

The coronavirus pandemic resulted in the closure of international borders, lockdown, and economic instability, thus impact medication availability. Since, most of the drugs distributed in the pharmacies are imported from outside the country. Furthermore, raw materials used in drugs production locally in Sudan are also imported.

A marked decrease in drug availability is in chronic medications, such as anti-diabetic, anti-hypertensive, and blood-thinning agents. In this perspective, patients with chronic illnesses are the most affected by this decrease. Nevertheless, patient adherence is unexpectedly high as shown in **Figure 4**; this is because individuals resort to alternative methods to obtain their medication. One of which was to order their medication from nearby countries (illegally) in bulk amounts to store in their houses for several months. Another way was asking their physicians to prescribe an available drug alternative.

Pharmacists also acknowledged that the awareness of patients toward their medication and illnesses in general increased. This can be seen clearly when patients were asked about their trusted medical advice sources, most of them acquired information from consulting their doctor or pharmacist. This may contribute toward the high percentage of patient adherence. This could be encountered as a positive impact of COVID-19 pandemic.

5. Conclusions

All in all, pharmacists agreed that COVID-19 had a significant impact on drug availability 87% of pharmacists noticed a decrease in availability. Furthermore, chronic medications were most affected. Despite this, patient non adherence was found to be only 16% which is relatively low, while the adherence was 84%. According to patients, more than half of the study population is still facing obstacles attaining their medication. To sum up, despite the challenges faced during pandemic to find medications by Sudanese population due to the unavailability of their medication, they seek alternative to overcome this problem.

This study faced limitations, for example, we can't generalize the findings to overall population because of the sample size, moreover, the lack of previous research on patient adherence in Sudan. There are a limited number of studies regarding this topic. Our suggestion is that more research should be done with high number of sample size.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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