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Assessing the Challenges of Pharmaceutical Practices during COVID-19 Pandemic in Nigeria

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Abstract

Pharmacies are the frontline of the pandemic and critical to maintaining public health. The emergence of COVID-19 brought unprecedented challenges and changes to all nations of the world. In the light of this, this study assessed the challenges of pharmaceutical practices in Nigeria during COVID-19. A descriptive cross-sectional survey design was adopted, and the data were collected from 1,200 respondents through the interview schedule and structured questionnaire using a systematic random sampling technique. A total of 1,118 copies of the questionnaire were retrieved, coded, and analysed using descriptive and inferential statistics aided by the SPSS software version 23. The study discovered different factors that influenced the effective practice of pharmacists during the COVID-19 pandemic. The findings of this study revealed that the majority, 591(52.9%) of the pharmacists, encountered difficulties on the road with security personnel while on essential duty and also found it 'somewhat difficult to work during the pandemic. The results of Factor Analysis grouped the major challenges into material and financial constraints. The results showed two orthogonal factors pharmaceutical practices, which were derived with the total explanation of 65.35% of the variance. Only variables with constraints loadings of 0.70 and above were used in naming the constraints. The material constraint has the greatest impact on effective practices of pharmacists to provide treatment for illnesses during COVID-19 with a 44.16% contribution. There is a need for government and institution supports for better and effective pharmaceutical practices before, during, and after any sort of pandemic, especially in drugs supplies and financial assistance.

Keywords: *Assessment, Challenges, COVID-19 Pandemic, Pharmaceutical Practices, Nigeria.*

Introduction

The Coronavirus disease 2019 (COVID-19), declared and recognized as a global health emergence and a global pandemic by [1-3], is a communicable disease caused by the newly discovered Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Coronaviruses are also described as zoonotic, as they are usually transmitted between animals and man through direct contact with an infected person [4, 5]. COVID-19 pandemic was primarily discovered in Wuhan, China, and reported to World Health Organization (WHO) in December 2019 [6, 7]. In December 2019, the emerging infectious disease called the novel coronavirus (COVID-19) outbreak, began and spread worldwide [8]. The emergence of novel Coronavirus disease (COVID-19) since late 2019 introduced a global health crisis that has revealed the present-day health systems limits globally [6]. Though, studies have stated that coronavirus was first identified in 1937 as an infectious bronchitis virus with which birds suffered that devastated poultry stocks [5]. In the past 70 years, studies have found camels, cattle, cats, dogs, horses, mice, pigs, rats, and turkeys that were infected with coronaviruses [5]. Respiratory syndrome coronavirus (MERS-CoV) [WHO, 2020] and Severe Acute

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Respiratory Syndrome (SARS) are mainly caused by coronaviruses [WHO, 2020]. The most common symptoms of coronavirus in patients are fever, dry cough, and respiratory problems [8]. It was reported that 80% of the infected cases are mild or asymptomatic [8]. The descriptions of clinical signs and symptoms of coronavirus disease and advice on preventive behaviors have historically been passed from one generation to another, helping to shape many religious and socio-cultural conventions [7].

The increasing numbers of infectious cases overwhelmed the workload in healthcare sectors in different countries [11]. The pandemic brought unprecedented challenges and changes to all the nations of the world (including Nigeria). For example, unprecedented mortality, distress, and mental resilience are some of the challenges posed by the COVID-19 pandemics [3, 12, 13]. In Africa, it was reported that confirmed cases of COVID-19 rose to 1,203,769 and 28,289 deaths as of 25th August 2020 [14]. The Federal Ministry of Health reported the first case of COVID-19 in Nigeria on February 27, 2020, in Lagos [15]. Since that period, there has been a drastic increase in the number of daily reported cases in the country, with 166,682 confirmed cases and 2,117 deaths as of June 3, 2021 [16]. In spite of the fact that Nigeria is the most populous country in Africa, the country had about 2.7% confirmed cases and 1.8% death of COVID-19 in the region as of the second quarter of 2020 [17].

Since Nigeria solely depends on importation to meet its demands, the country suffered a huge blow to several sectors, including the pharmaceutical industry. Even though the local industry in Nigeria fairs better when compared to its counterparts in other developing countries in Sub-Saharan African [15]. In March 2020, when the COVID-19 pandemic had a tremendous effect on every sector of the economy, especially the pharmaceutical sector and practices as well as the health and market economy, strict measures were taken, most importantly the lockdown measure. Consequently, the pandemic affected the economy by directly affecting production in major countries that are sole manufacturers of raw materials, intermediate products, and consumer goods, thereby creating supply chain and market disruption, and by its financial impact on firms and the financial markets.

As part of the emergency response activities across all States in Nigeria, health education campaigns were directed at members of the public [17, 18]. In spite of all the basic precautionary and/or preventive measures put in place to curb the spread of COVID-19, pharmaceutical practices and other health care professionals faced some challenges in one way or the other during the pandemic. Studies have shown the impacts of COVID-19 in every region and/or continent of the world, especially in America, Europe, and Asia [19, 20].

In Nigeria, studies have been conducted on COVID-19 [15, 17, 21-27]. From these previous studies, little or no studies have been conducted on the challenges facing pharmaceutical practices during COVID-19 in Nigeria. This study filled this gap by assessing the challenges of pharmaceutical practices in Nigeria during COVID-19 with a view to illuminating areas of strengths and weaknesses for future improvement.

Pharmacy and Pharmaceutical Practices

Pharmacists are critical for attaining the goal of universal health coverage and equitable access to essential health services, particularly in relation to access to medicines and medicines expertise [28]. Pharmacists, the third largest and most accessible healthcare professionals in the world [2, 29], are often the first point of contact with the health system in many countries [30, 31]. Pharmacists are central to attaining the goal of equitable access and rational use of medicines — a key objective of universal health coverage [32].

Pharmacies are regarded as the frontline of the pandemic and critical to maintaining public health. Pharmacy and Pharmacy Practice. In recent years, pharmacy, like other health professions, has undergone a change in the way it is practiced because of technological advances and the changes in the nature of health care delivery [33]. Pharmacy practice serves to facilitate the appropriate use of medicines. In traditional approaches to clinical pharmacy, it was thought that this could be achieved by helping to ensure that individual patients received the 'correct medicine in the correct dose at the correct time'.

Materials and Methods

The study area is Nigeria. It lies between latitudes 4o and 14o North of the equator and longitudes 2o 42' and 15° 00' East of the Greenwich Meridian (Figure 1) [34]. In 2016, the population of the study area was put at 193,392,517 [35]. The study area comprises the Federal Capital Territory (FCT, Abuja) and 36 states that are subdivided into 774 Local Government Areas (LGAs) [36]. The study area was based on the six geo-political regions (including FCT) (Figure 1). Infectious diseases such as malaria, HIV/AIDs, and tuberculosis are leading causes of death in the country [37]. Although current estimates indicate improvement in under-five and maternal mortality rates between 1990 and 2012 in Nigeria, these are still significantly high at 117/1000 and 560/100,000 live births, respectively, compared to other countries in the SSA region [37].

Evidence also indicates an increasing prevalence of non-communicable and chronic diseases, including diabetes, hypertension, cardiovascular diseases, and stroke in the country [38-40]. Overall health status and access to healthcare vary across the different regions in the country, with existing reports suggesting that health indicators are generally worse in the northern region compared to the Southern [41].

The study adopted a descriptive cross-sectional survey designed specifically to elicit information from the respondents among the targeted population. The research instrument was a standardized structured (close-ended) and unstructured (open-ended) self-administered and electronic questionnaire to collect data. The questionnaire was tested to establish its validity and reliability. The researcher passed the questionnaire through experts and public health professional researchers to appraise the relevance of the questions in relation to the topic to determine if it would test what it was intended for. This tool was furthermore pretested before being administered. 1,200 professional and practice pharmacists in hospital practice, community practice, and industrial practice were systematically and randomly selected across the six geo-political zones in Nigeria. A total of 1,118 copies of the questionnaire were retrieved, coded, and analyzed using descriptive and inferential statistics, while the Statistical Package for Social Sciences (SPSS) software version 23 was used to run the analyses. Descriptive statistics include the use of frequency, percentages, mean, and standards deviation, while inferential statistics include exploratory factor analysis. The researcher ensured that all the administered copies of the questionnaire were collected, checked, and coded in an excel Microsoft package. The reliability coefficient of the questionnaire was assessed. Mean scores and standard deviations analysis procedures were used for the challenges facing pharmaceutical practices in the study area. The challenges facing pharmaceutical practices were further subjected to exploratory factor analysis. Factor analysis is a technique of data reduction used to collate a huge quantity of observed items statistically into a lesser set of latent variables termed factors due to their fundamental bivariate correlation patterns [42, 43]. Exploratory factor analysis procedure using the principal factor model with iteration and varimax rotation was further employed in

grouping the constraints variables into major factors. However, only variables with loadings of 0.70 and above were used in naming the factors.

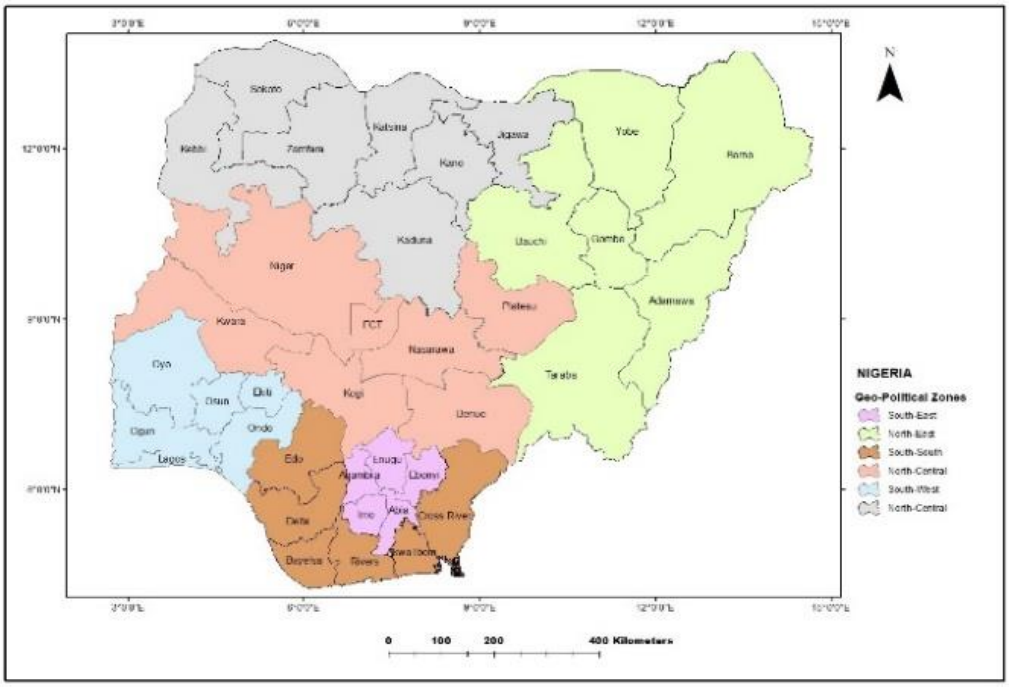

Figure.1. Map of the Study Area, Nigeria

Results

Demographic Characteristics of the Respondents

Table 1 presents the socio-demographic characteristics of the respondents in the study area are presented.51.4% of the respondent were male.

The respondents between 30 and 59 years constituted the larger population of 84%. 81.2% of the respondents were married in the study area, while all the respondents were professional pharmacists with university educational qualifications; 42.5% with Bachelor of Pharmacy, 25.8% with Master degree, and 6.3% with Ph.D. degrees. Hospital practice, community practice, and industrial, pharmaceutical practice constituted the larger population of the respondents of 51.2%, 1.9%, and 7.2%, respectively.

Health insurance, marketing/production, administrative, political, and non-Governmental organizations were other areas of pharmaceutical practice. Those pharmacists (respondents) who had spent between 20 and 24 years constituted 21.3% (Table 1). The majority, 722 (64.6%) of the respondents (Pharmacists) in the study area, worked for 6-8 hours per day.

Table 1. Demographic Characteristics of the Respondents

Variables		**Frequency**	**Percent (%)**
Gender	Male	575	51.4
	Female	513	45.9
	Prefer not to say	30	2.7
	Total	**1118**	**100.0**
Age Bracket	18-29	130	11.6
	30-39	256	22.9
	40-49	357	31.9

	50-59	326	29.2
	60-69	49	4.4
	Total	**1118**	**100.0**
Marital Status	Single	200	17.9
	Married	908	81.2
	Separated	10	0.9
	Total	**1118**	**100.0**
Educational Level	B. Pharm	475	42.5
	Masters	288	25.8
	Postgraduate Fellowship	255	22.8
	PhD.	70	6.3
	Others	30	2.7
	Total	**1118**	**100.0**
Area of Practice	Academia	10	0.9
	Hospital	572	51.2
	Community	357	31.9
	Industrial	80	7.2
	Public Health	69	6.2
	Others	30	2.7
	Total	**1118**	**100.0**
Other Areas of Practice	Do not practice in any other area	1008	90.2
	NGO	10	0.9
	Health Insurance	40	3.6
	Marketing/Production	20	1.8
	Academia	20	1.8
	Administrative	10	0.9
	Politics	10	0.9
	Total	**1118**	**100.0**
Years of Practice	Less the 5 Years	179	16.0
	5 - 9 Years	79	7.1
	10 - 14 Years	268	24.0
	15 - 19 Years	108	9.7
	20 - 24 Years	238	21.3
	25 - 29 Years	157	14.0
	30 Years and above	89	8.0
	Total	**1118**	**100.0**
Average number of daily hours of work	3 - 5 Hours	20	1.8
	6 - 8 Hours	722	64.6
	9 - 11 Hours	277	24.8
	12 Hours and Above	99	8.9
	Total	**1118**	**100.0**

Challenges Faced by Pharmacists and Pharmaceutical Practices during Covid-19

Table 2 and Figure 2 present the difficulties encountered by pharmacists during COVID-19 in the study area. The results showed that 52.9% of the pharmacists encountered difficulties on the road with security personnel while on essential duty. As a result, only 8.1% of the respondents indicated that it was very difficult for them to work during the COVID-19 pandemic, while the majority 513(45.9%) indicated 'somewhat difficult to work during COVID-19 pandemic in the study area (Table 3).

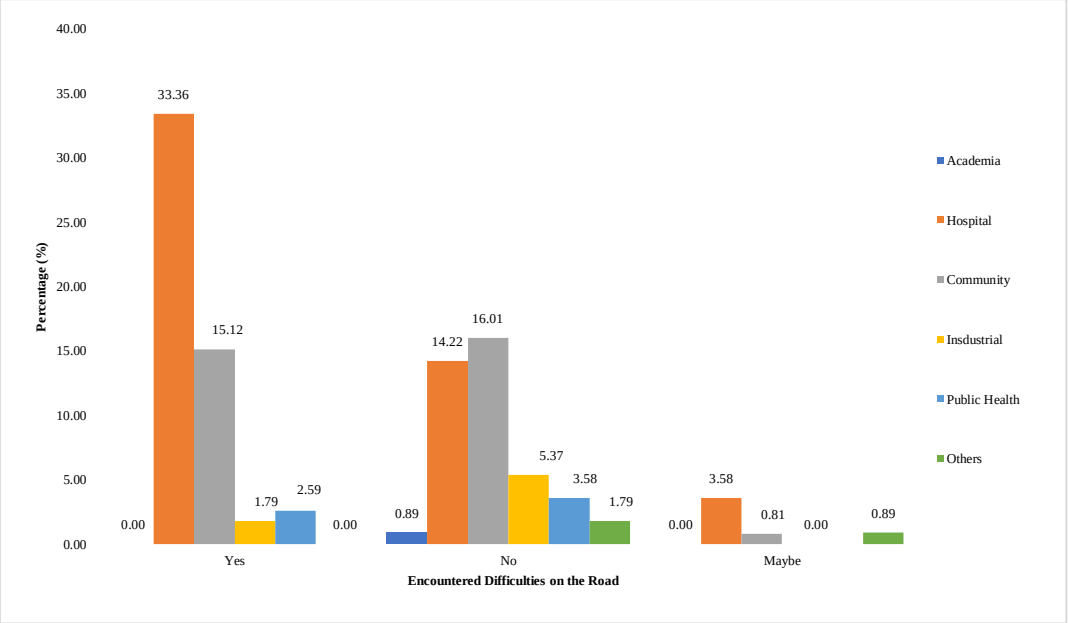

Figure 2. Difficulties Encountered on the Road by the Respondents during COVID-19 Pandemic

Table 2. Statistics of the Difficulties Encountered on the Road during COVID-19

	Area of Practice						Total
	Academia	Hospital	Community	Industrial	Public Health	Others	
Yes	0 (0.0)	373 (33.36)	169 (15.12)	20(1.79)	29(2.59)	0(0.0)	591(52.86)
No	10(0.89)	159(14.22)	179(16.01)	60(5.37)	40(3.58)	20(1.79)	468(41.86)
Maybe	0(0.0)	40(3.58)	9(0.81)	0 (0.0)	0 (0.0)	10(0.89)	59(5.28)
Total	10(0.89)	572(51.16)	357(31.93)	80(7.16)	69(6.17)	30(2.68)	1118(100)

Table 3. How Difficult it was to Work during COVID-19 in Pharmaceutical Practices

	Area of Practice						Total
	Academia	Hospital	Community	Industrial	Public Health	Others	
Very Difficult	0.0	50(4.47)	20(1.79)	0.0	20(1.79)	0.0	90(8.05)
Very Easy	0.0	29(2.59)	49(4.38)	0.0	0.0	20(1.79)	98(8.77)
Somewhat Easy	10(0.89)	109(9.75)	109(9.75)	20(1.79)	40(3.58)	0.0	288(25.76)

Somewhat Difficult	0.0	275(24.60)	159(14.22)	60(5.37)	9(0.81)	10(0.89)	513(45.89)
Not Sure	0.0	109(9.75)	20(1.79)	0.0	0.0	0.0	129(11.54)
Total	10(0.89)	572(51.16)	357(31.93)	80(7.16)	69(6.17)	30(2.68)	1118(100)

A larger percentage (86.6%) of the respondents encountered poor patronage, shortage of cash flow (85.7%), and shortage of drugs/medication, and the high cost of raw materials as well as other consumables with a percentage of 83.98% (Figure 3). The mean and standard deviation results of the challenges are also presented in Table 4, where a shortage of raw materials (mean =1.31), high cost of raw materials (mean = 1.21), shortage of drugs/medications (mean=1.21), and shortage of cash flow (1.20) are the major challenges faced by pharmaceutical practices in the study area. Other challenges encountered by the respondents during the COVID-19 pandemic include food and house maintenance supplies, restriction from teaching and research, and the fear of getting the infection.

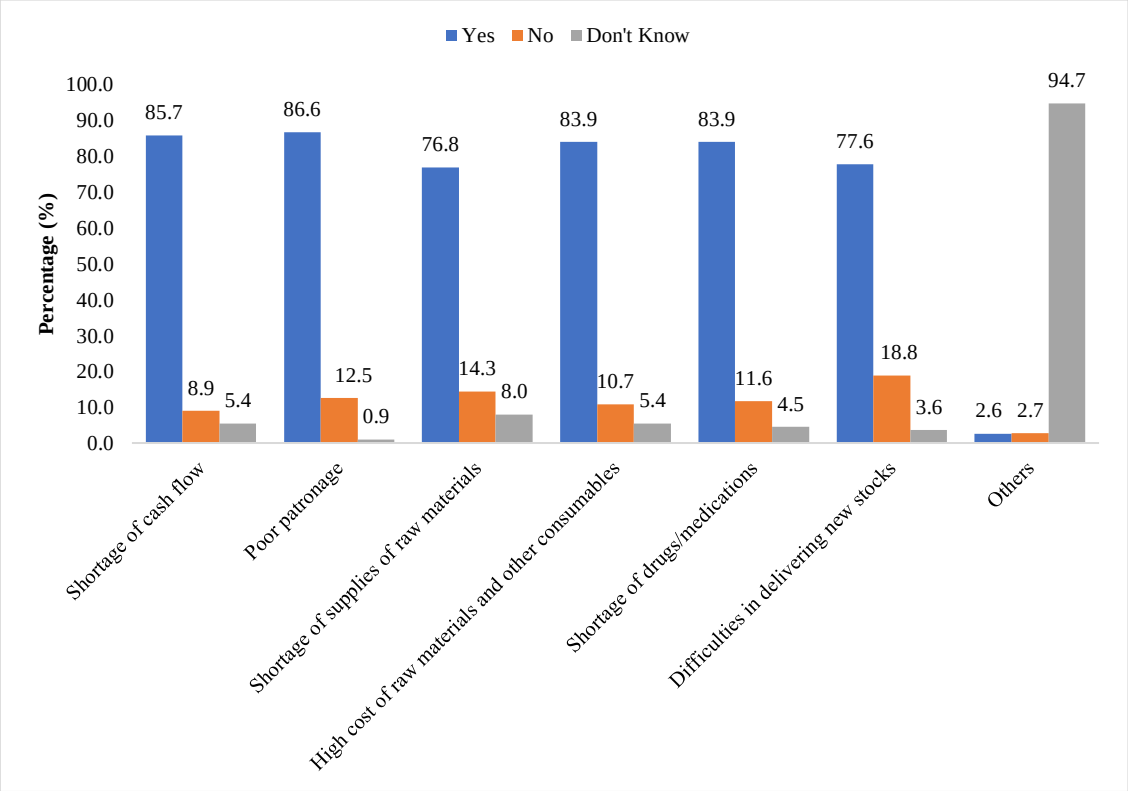

Figure 3. Challenges Faced by Pharmaceutical Practices during COVID-19 Pandemic

Table 4. Statistics of the Challenges Faced by Pharmaceutical Practices (n = 1118)

Challenges Encountered	Mean	Std. Deviation
Shortage of cash flow	1.1968	0.51539
Poor patronage	1.1431	0.37503
Shortage of supplies of raw materials	1.3051	0.61072
High cost of raw materials and other consumables	1.2147	0.52552
Difficulties in delivering new stocks	1.2594	0.51371
Shortage of drugs/medications	1.2057	0.50306

[1]Ranged from 1 "Yes" to 3 "Don't Know."

The results of the rotated component matrix showing the extracted factors based on the responses of respondents are shown in Table 5. The results showed two orthogonal factors in the challenges faced by pharmaceutical practices in the study area, which were derived with the total explanation of 65.35% of the variance. Only variables with constraints loadings of 0.70 and above were used in naming the constraints. The Eigenvalues, percentage of variance, and cumulative percentage of the variance explained are also presented in Table 5.

Table 5. Challenges Encountered during COVID-19 Pandemic

Items Description	**Factor 1**	**Factor 2**
Shortage of supplies of raw materials	0.839	-0.004
Shortage of drugs/medications	0.8	0.146
High cost of raw materials and other consumables	0.745	0.227
Shortage of cash flow	-0.103	0.874
Poor patronage	0.286	0.78
Difficulties in delivering new stocks	0.438	0.54
Factor Description	Materials	Financial
Eigenvalues	2.650	1.271
% of Variance	44.161	21.191
Cumulative % of Variance Explained	44.161	65.352

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
[a]Rotation converged in 3 iterations

The factor I is tagged "materials constraint". These two factors or constraints have an impact on pharmacists and/or pharmaceutical practices in Nigeria. The eigenvalue of Factor I is 2.65, with 44.16% of the variance. The factor I have very high significant loading on the variable 'shortage of supplies of raw materials (0.84), "shortage of drugs/medications" (0.80), and moderately high loading on the variables 'high cost of raw materials and other consumables (0.75).

Factor II, which is tagged "financial constraint", has an Eigenvalue of 1.23 and contributed 21.19% to the variance in the challenges of pharmaceutical practices in the study area. Factor II has the highest loading on 'shortage of cash flow' and 'Poor patronage' with loading points 0.87 and 0.78 respectively.

The finding of this study further showed that 46.06% of the respondents in the pharmaceutical practices faced a shortage of staff/personnel in the study area (Table 6). Hospital pharmaceutical practice faced a 31.84% shortage of staff/personnel; community practice faced a 9.75% shortage of staff, while industrial practice, public health practice, and academia faced smaller percentages of shortage of staff during COVID-19 in the study area.

The rationale behind the shortage of staff/personnel in the pharmaceutical practices during COVID-19 is presented in Figure 4. 'Staff infected with COVID-19' was indicated by the majority (26.0%) of the respondents as the main reason for the shortage of staff during COVID-19.

Furthermore, respondents revealed that 'government directives/orders for junior staff to stay at home, 'family pressure to stay at home, and 'the anxiety among the staff of being infected with the viruses were indicated as the minor reasons for the shortage of staff during COVID-29. The restriction of staff to move

around during the COVID-19 pandemic was not a reason for the shortage of staff in the pharmaceutical practices during COVID-19, as indicated by the respondents.

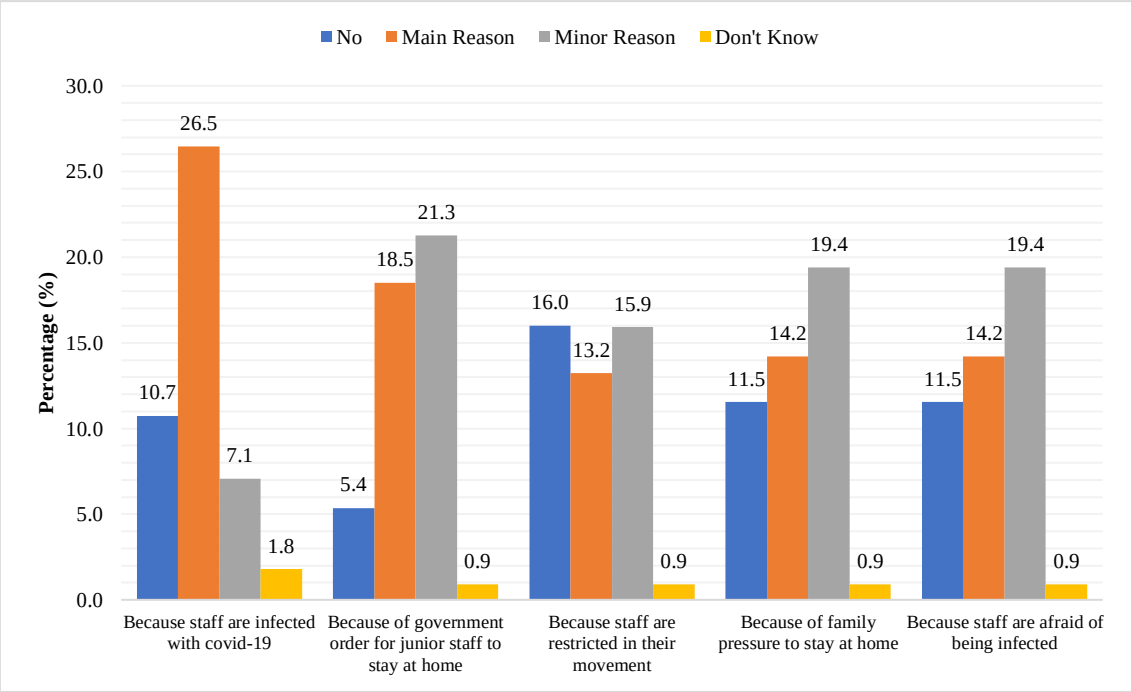

Figure 4. Perception on the Major Reasons for the Shortage of Staff/Personnel in the Pharmaceutical Practices during COVID-19

Table 6. Shortage of Staff in Pharmaceutical Practices during COVID-19

	Yes	**No**	**Maybe**	
Academia	0.0	10(0.89)	0.0	10(0.89)
Hospital	356 (31.84)	196(17.53)	20(1.79)	572(51.16)
Community	109(9.75)	248(22.18)	0.0	357(31.93)
Industrial	10(0.89)	70(6.26)	0.0	80(7.16)
Public Health	20(1.79)	49(4.38)	0.0	69(6.17)
Others	20(1.79)	10(0.89)	0.0	30(2.68)
Total	515(46.06)	583(52.15)	20(1.79)	1118(100)

Discussion

Findings of this study revealed that pharmacists encountered difficulties on the road with security personnel while on essential duty, and only 8.1% of the respondents indicated that it was very difficult for them to work during the COVID-19 pandemic. The difficulties encountered on the road while on essential duties might be attributed to the directives given by the government to the law enforcement agencies during the lockdown approach in the study area. In contrast to the findings of a previous study, two-third of the respondents found it somewhat difficult or very difficult to work effectively during the COVID-19 pandemic [25].

Studies suggest that healthcare workers are at higher risk of infection when treating patients with COVID-19 [8]. They are also vulnerable to physical and emotional exhaustion [44] as well as the development of various mental health disorders [8]. This fact is confirmed by the higher grades of mental health symptoms reported throughout the pandemic [45]. Some of the challenges faced by the pharmaceutical practices include poor patronage, shortages of cash flow, shortage of drugs/medication, and

the high cost of raw materials. The challenges faced by the pharmaceutical practices could be a result of the restrictions of the economic activities and other contributing factors. The most common challenges that pharmacy professionals faced during COVID-19 were general anxiety about the impact of coronavirus on their life, and difficulties with communication with their co-workers, issues with internet connectivity, social isolation, to mention but a few [3, 8, 11, 12, 25]. All these afore-mentioned challenges faced by the pharmacists and/or pharmaceutical practices during the COVID-19 pandemic were grouped into two constraints factors, namely 'material constraints' and 'financial constraints'.

Hospital and community pharmaceutical practices faced the larger percentages of shortage of staff/personnel, which might be a result of the impact of the COVID-19 pandemic in the study area. The shortage of staff/personnel was due to the fear that some staff got infected with the virus, 'government directives/orders for junior staff to stay at home, 'family pressure to stay at home, and 'the anxiety of being infected with the viruses was indications of the shortage of staff in the study area.

The need for organizational and government supports is imperative for improving pharmaceutical practices in the study area. The ranking of 'online personnel training'; 'advice on how to prevent infections while maintaining all business operations and interstate movement'; 'adequate provision of work tools; training on diversification of products, services, and sales channels; and 'online management training' as their 1st priority needed as organizational supports is to better improve the profession and pharmaceutical practices to respond to the COVID-19 pandemic and other infectious diseases in the study area. This finding is similar to the findings, which stated that webinars on COVID-19, access to a community of support to share questions and concerns, and signposting to information are also important supports to better improve the pharmaceutical practices in the study area [25]. Not only organizational supports are needed for better improvement but also government supports.

Conclusion

The pharmaceutical practices and pharmaceutical healthcare professionals of Nigeria have shown to be contributing to the healthcare sector, especially with the emergence of COVID-19, which negatively affected pharmacists and pharmaceutical practices in the country. Many factors also affect the quality of health services provided by pharmacists, which include but are not limited to human resources, materials, and finances. As human resource is a vital component in delivering health services, pharmacists play significant roles in improving the health status of Nigerians. In this respect, the challenges of pharmaceutical practices during the COVID-19 Pandemic in Nigeria were assessed. This work has thrown more light on the difficulties and/or challenges faced by the pharmacists during COVID-19 and the needed supports for better improvement of pharmaceutical practices and lives of pharmaceutical professionals in Nigeria. This study recommends that government efforts should be made to lessen the total manufacturing and distribution costs of drugs; make access to cash/short-term finances available to pharmacists without all the bottle-neck processes and long protocols; approving and implementing friendly production and distribution policies during and after COVID-19 pandemic is very crucial.

Conflict of Interest

We have no conflict of interest to declare.

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