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Impact of COVID-19 Pandemic Lockdown on Clinical Dental Practice in Nigeria

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ABSTRACT

Background: **The COVID-19 pandemic has had profound effects on oral healthcare services globally.**

Objective: **The main objective of this study was to determine the impact of COVID -19 pandemic lockdown on clinical dental practice in Nigeria and discuss how adverse impact could be mitigated.**

Methods: **A cross-sectional self-administered pre-tested questionnaire-based survey of consenting dental practitioners from different States and geopolitical zones in Nigeria was employed for the study. Study participants were recruited by non-random convenience sampling. Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20.**

Results: **A total of 105 out of 142 respondents completed and returned the survey questionnaire giving a response rate of 74%. While only about 47% of respondents in public sector practice had their clinics shut down, all the respondents in private sector practice (100%) had their clinics closed down during the pandemic lockdown and the difference was statistically significant (p=0.000). Majority of respondents in private sector practice (65.4%) experienced income loss compared to 24.1% of respondents in public sector practice and this difference was also statistically significant (p=0.000).**

Conclusion: **The COVID-19 pandemic was associated with government instituted lockdown periods with attendant scaling down or outright closure of dental clinical practices in Nigeria. The private sector practice bore the brunt of the adverse impacts of the pandemic lockdown in terms practice shutdowns and attendant economic losses. The adverse impact of COVID-19 pandemic lockdown on clinical dental practice could be mitigated by the incorporation of teledentistry into routine dental practice.**

Keywords: COVID-19 pandemic, dentists, private practice, public sector.

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I. Introduction

Severe Acute Respiratory Syndrome corona virus 2 (SARS -CoV-2), the causative organism for Corona Virus Disease-19 (COVID-19) was first described in December 2019 in Wuhan, China's Hubei province capital city. The virus subsequently spread globally leading to the World Health Organisation declaring COVID-19 a pandemic on March 11, 2020 [1]. The first case of COVID-19 in Nigeria was officially reported on February 27, 2020 and involved an Italian citizen, who came to Lagos from Europe [2]. By June 7, 2020 12,486 COVID-19 positive cases had been reported in the country of which 354 of the affected persons died [2]. However, most people infected with SARS-CoV-2 in the country were asymptomatic and many of those with symptoms had mild to moderate respiratory illness and recovered without requiring intensive care [2].

Dental practitioners were considered a high risk group for developing SARS-CoV-2 infection because of the aerosols produced during dental procedures, and routine dental care services were scaled down due to temporary lockdown periods across the country [2]. During the lockdown period imposed during the first wave of COVID-19 pandemic, dental treatment was generally suspended or postponed, except for urgent or emergency care. In the initial months of the pandemic, with high infection rates and relatively high mortality across the globe, many national authorities including dental organizations imposed several restrictive measures on the dental profession [2]-[4]. In Nigeria, apart from scaling down dental care services it was recommended that dental clinics, especially private facilities that were unable to secure the basic personal protective equipment (PPE) or COVID-19 test kits, should shut down completely, until adequate arrangements are made for such essential materials [4]. These recommendations resulted in more than 80% of private dental clinics in Nigeria shutting down their practice due to inability to procure the required safety kits [4], [5].

A survey study of 3,244 dentists from 29 countries across

all continents, including Egypt and Tanzania in Africa, found a 75.9% practice closure with significantly higher percentage in the private sector than the non-private sector [6]. This was consistent with reports indicating that a lower patient volume due to avoidance of healthcare facilities and fear of COVID-19 resulted in financial losses in dental practices [6]. A survey in the United States of America in March 2020 found 28% of dentists could not pay their staff while 45% of dentists could only make partial payments [7], [8]. One study estimated that if the pandemic lockdown continued, a large proportion of dentists and dental practices would face serious financial hardships [9].

The main objective of this study was to determine the impact of COVID-19 pandemic lockdown on clinical dental practice in Nigeria during the first wave of the pandemic and discuss way(s) in which potential adverse impact(s) could be mitigated.

II. Material and Methods

The authors of the accepted manuscripts will be given a copyright form and the form should accompany your final submission. A cross-sectional, non-random, convenience sampling was adopted for this study. The sample size of 105 was completely based on convenience. The number of licenced dental practitioners in Nigeria has varied over the years; from 2,598 in year 2000 (of which 35.1% were females) [10] to 3000 dentists in 2012 [11] and 4,060 by 2017 [12]. However, a significant number of these licensed dentists are practicing in the diaspora.

The study setting was a Nigerian Dental Association (NDA) National Conference in Abuja, Nigeria's capital city and the study participants were dental practitioners from different states and geopolitical zones of Nigeria attending the conference. The respondents included dental practitioners in public and private sector practice and from diverse clinical specialty backgrounds.

The study instrument was a self-administered questionnaire-based survey of consenting dental practitioners. The questionnaire was distributed to a total of 142 consenting dental practitioners and had three main sections: 1. Sociodemographic; 2. Knowledge of COVID-19; and 3. Impact of the COVID-19 pandemic on clinical practice of respondents. Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics were used to compute mean and standard deviation and chi-square for association. Level of significance was set at $P < 0.05$.

III. Results

A total of 105 respondents completed and returned the survey questionnaire giving a response rate of 74%. Table I shows sociodemographic characteristics of respondents. With respect to geopolitical location of respondents' clinical practice, southwest geopolitical zone was the commonest location of practitioners (41.9%) followed by the federal capital territory, Abuja (31.4%) (Fig. 1).

The level of awareness of COVID-19 pandemic (99%) including accurate knowledge of its aetiology (90.5%) was very high among respondents. Loss of smell, cough, difficulty with breathing/shortness of breath, fever, sore throat, loss of taste were the most common symptoms respondents associated with COVID-19 (Table II). On the impact of COVID-19 pandemic lockdown on respondents' clinical practice, 60% of respondents reported their practice was shut down during the pandemic (Table III).

TABLE I: Demographics

Variable	Frequency	Percent
Age of dentists		
Less than 29 years	5	4.8
30 – 39 years	43	41.0
40 – 49 years	28	26.7
50 – 59 years	23	21.9
60 years and above	6	5.7
Total	105	100.0
Mean ±SD = 49.38.95±9.7 years		
Gender of dentists		
Female	48	45.7
Male	57	54.3
Total	105	100.0
Postgraduate Educational Qualification		
Postgraduate Fellowship	36	34.3
Masters	13	12.3
PhD	4	3.8
Others	6	5.7
Respondents that are Specialists		
Non specialists	52	49.5
Specialists	53	50.5
Total	105	100.0
Respondents' Years of Clinical Practice		
1- 9 years	29	27.6
10-19	42	40.0
20-29	21	20.0
30-39	13	12.4
Total	105	100.0
Sector in which respondents work		
Private	26	24.8
Public	79	75.2
Total	105	100.0

TABLE II: Knowledge of COVID-19 Pandemic

Variable	Frequency	Percent
Respondents that are aware of the COVID-19 pandemic		
No	1	1.0
Yes	104	99.0
Total	105	100.0
Respondents' knowledge of causes of COVID-19 pandemic		
Virus	95	90.5
Evil force	1	0.9
Laboratory accident	2	1.9
Lack of awareness and poverty	1	0.9
Nil	6	5.8
Total	105	100.0
Knowledge Symptoms of COVID-19 Pandemic		
Headache	84	80.0
Fever	99	94.3
Conjunctivitis	28	26.7
Cough	104	99.0
Tiredness	84	80.0
Sore throat	98	93.3
Loss of taste	92	87.6
Loss of smell	105	100.0
Skin rash	33	31.4
Discoloration of fingers	12	11.4
Discoloration of toes	14	13.3
Shortness of breath	97	92.4
Difficulty breathing	102	97.1
Chest pain	85	81.0
Loss of speech	18	17.1
Loss of movement	17	16.2

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TABLE III: IMPACT OF COVID-19 PANDEMIC ON RESPONDENTS' CLINICAL PRACTICE

Respondents whose practice shut down	Public Practice No. (%)	Private Practice No. (%)	Total
Yes	37 (46.8%)	26 (100%)	63 (60%)
No	42 (53.2%)	0 (0%)	42 (40%)
Total	79	26	105 (100%)

Regarding the effectiveness of COVID-19 pandemic lockdown measures, majority of the respondents considered them effective in controlling the spread of SARS-CoV-2 while 34.3% of respondents did not think they were effective. One respondent (0.9%) did not know whether or not they were effective (Table IVA). There was no statistically significant difference between the public and private sector practitioners with respect to views regarding the effectiveness of COVID-19 pandemic lockdown measures (p=0.756). While about 47% of respondents in public sector practice had their clinics shut down, all the respondents in private sector practice had their clinics shut down during the pandemic. The mean duration of practice shut down was 9.71 weeks and the difference between the public sector practitioners and the private sector practitioners with respect to clinical practice closure was statistically significant (p=0.000) (Table IVB). With respect to the economic impact of the pandemic lockdown 34.3% of all the respondents reported loss of income occasioned by the pandemic. Majority of respondents in private practice (65.4%) experienced income loss compared to respondents in public sector practice (24.1%). This difference was statistically significant (p=0.000) (Table IVC). In terms of compliance with COVID-19 lockdown measures majority of respondents (76.2%) reported they were compliant. The level of compliance was relatively better among respondents in private practice (86.4%) compared to the respondents in public practice (73.4%) but the difference was not statistically significant (p=0.245) (Table IVD).

In terms of relationship between being a specialist or not and the association with clinic shut down in the private or public sector practice, the results showed no significant association (p=0.081) (Table V).

TABLE IV: SIGNIFICANCE OF OBSERVED IMPACT OF COVID-19 PANDEMIC ON CLINICAL DENTAL PRACTICE OF RESPONDENTS

A. Were the lockdown measures effective?	What sector do you work in?				Total		X^2	df	P value
	Private		Public						
	No.	%	No.	%	No.	%			
I don't know	0	0	1	1.3	1	0.9			
No	8	30.8	28	35.4	36	34.3	0.560	2	0.756
Yes	18	69.2	50	63.3	68	64.8			
Total	26	100	79	100.0	105	100.0			
B. Was your clinic shut down at any point as a result of this pandemic?									
No	0	0	42	53.2	42	40.0			
Yes	26	100	37	46.8	63	60.0	23.038	1	0.000**
Total	26	100	79	100.0	105	100.0			
C. Did you lose a part of your income as a result of this pandemic?									
No	9	34.6	60	75.9	69	65.7			
Yes	17	65.4	19	24.1	36	34.3	14.834	1	0.000**
Total	26	100	79	100.0	105	100.0			
D. Did you fully comply with the lockdown measures?									
No	4	15.4	21	26.6	25	23.8			
Yes	22	84.6	58	73.4	80	76.2	1.352	1	0.245
Total	26	100.0	79	100.0	105	100.0			

NB: ** shows statistically significant relationship (p value < 0.05)

TABLE V: ASSOCIATION BETWEEN BEING A SPECIALIST IN PRIVATE/PUBLIC SECTOR PRACTICE AND PRACTICE SHUT DOWN

Was your clinic shut down at any point as a result of this pandemic?		What sector do you work in?		Total	X^2	df	P value
		Private	Public				
No	Non- Specialist	0	19	19	3.001	1	0.083
	Specialist	0	23	23			
	Total	0	42	42			
Yes	Non- Specialist	17	16	33	3.037	1	0.081
	Specialist	9	21	30			
	Total	26	37	63			

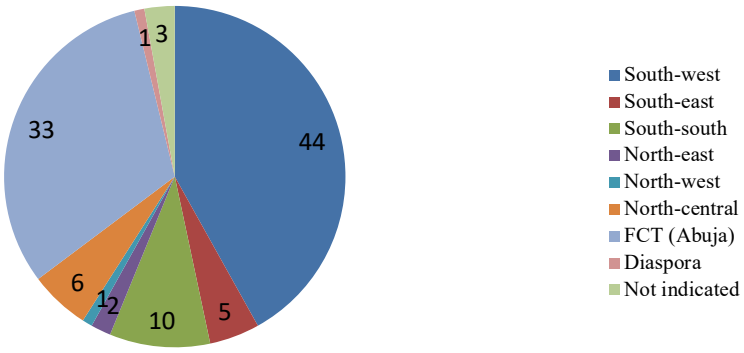

Fig. 1. Number of respondents from geopolitical zones of Nigeria.

IV. Discussion

The response rate of 74% for respondents in this study is similar to the response rate of other previous studies such as 74.5% reported by [13] in a study of perceived impact of the COVID-19 pandemic on orthodontic practice in Nigeria, and 75% reported by [14] in a study of Nigerian dentists' knowledge of aggressive periodontitis. Also, the predominance of male dental practitioners and predominant age distribution of respondents in this study is similar to those of other local and international studies [5], [6], [10], [11]. Just over half of respondents in this study were specialists in various fields of dentistry compared to 70.6% in a global survey study of dentists in 29 countries [6]. The relatively higher distribution of dental practice clinics in the south-west, south-south and north-central geopolitical zones in this study aligns with the pattern reported by [11].

Respondents in this study had good awareness of COVID-19 pandemic and good knowledge of patterns of clinical presentation of COVID-19. Reference [15] similarly noted good knowledge of COVID-19 among Nigerian dentists undergoing residency training. Furthermore, this present study found a similar pattern of knowledge of most common symptoms of COVID-19 such as fever, cough, sore throat, shortness of breath, and loss of smell among dental practitioners to that observed in a previous study involving a national survey of COVID-19 outbreak and dental health care provision in Nigeria [16].

A. Impact of COVID-19 Pandemic on Respondents' Clinical Practice

This present study found that COVID-19 pandemic lockdown had significant impact on majority of clinical dental practices in Nigeria with the clinical practice of 60% of respondents' in this study closing down during the first wave of the pandemic. Private practice was significantly much more impacted with 100% of private practices shutting down during the pandemic. These findings were lower than the approximately 76% reported practice closure in a global survey of 29 countries from across all the continents of the world, but as was found in this study, there was a significantly higher percentage of practice closures in the private sector than the non-private sector [6]. Moreover, the economic impact of the pandemic lockdown was also worse for private dental practices which experienced statistically significant income loss compared to the public sector dental practitioners. A study from Benin City in south-south geopolitical zone of Nigeria found that restorative dental practitioners reported decreased patient flow as well as increased treatment costs in their practice with resultant adverse impact on income generated during the pandemic period [5]. Similar bleak economic outlook for dental practices was noted in other parts of the world [7]-[9].

The findings in this present study reflected the recommendation of Nigerian government health authorities that dental clinics, especially private facilities that were unable to secure the basic personal protective equipment (PPE) or COVID-19 test kits, should shut down completely until adequate arrangements are made for such essential materials [2], [4]. As a result of the challenging economic situations associated with pandemic lockdown, private dental clinics in Nigeria faced complete closure of dental care practices or downsizing of dental workforce with attendant potential job losses for various categories of dental practitioners during the first phase of the COVID-19 pandemic [4]. In this present study, one private dental practitioner reported job loss. In the United States and other countries in the developed world businesses such as dental practices on account of national government imposed COVID-19 pandemic lockdowns received significant financial compensation from the national government for their economic losses. No such financial compensation was made available to businesses in Nigeria including dental practices and in particular private practitioners who bore the brunt of the adverse economic consequences of the COVID-19 pandemic lockdown.

The adverse impact of COVID-19 pandemic lockdown on clinical dental practice could be mitigated by the incorporating teledentistry into routine dental practice [17]. For instance, the use of smartphones for detection of dental caries has been well advocated [18], [19]. Teledentistry could provide a wide range of applications such as remote triaging of the suspected COVID-19 patients for dental treatment thereby reducing exposure of healthy or uninfected patients by decreasing frequency of visits to dental facilities [20]. Moreover, it would keep the dental clinical practice open thereby ensuring some degree of economic stability during a pandemic lockdown period.

Despite the notable adverse impact of COVID-19 pandemic lockdown measures on dental clinical practice, majority of respondents in this present study from both the private and public sector practices expressed the view that the lockdown was effective in controlling the spread of COVID-19 virus. Their views were in agreement with studies that evaluated the effectiveness of the lockdown in Nigeria [21], [22].

In this study, having a specialist dental qualification was not related to practice shutdown with respect to private sector or public sector clinical dental practice. This is in contrast to the finding of a multi-national survey study by Abdelrahman et al which showed a statistically significant difference between private sector and non-private sector dental practitioners in relation to dental specialization and practice closure [6].

V. Conclusion

The COVID-19 pandemic brought in its wake compulsory government imposed lockdown periods with attendant scaling down or outright closure of dental clinical practices in Nigeria. Private dental practices bore the brunt of the adverse impacts of the pandemic lockdown in terms practice closures with attendant economic losses. The adverse impact of COVID-19 pandemic lockdown on clinical dental practice could be mitigated by the incorporation of teledentistry into routine dental practice.

Conflict of Interest

Authors declare that they do not have any conflict of interest.

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