

The surgical operating theatre and COVID-19 pandemic: knowledge, attitude and challenges in a low-income setting

Rex Friday Ogoronte A. Ijah¹, Joy O. Dayi², Friday E. Aaron³,
& Rose E. Oko-Jaja⁴

¹Department of Surgery, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria.

²Department of Anesthesia, University of Port Harcourt Teaching Hospital, and Lecturer of the University of Port Harcourt, Port Harcourt, Nigeria.

³Department of Surgery, Rivers State University Teaching Hospital, and Rivers State University Port Harcourt, Nigeria.

⁴Main Theatre, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria.

Abstract

Aim: The aim of this study was to investigate the knowledge and attitude of operating theatre users, and challenges envisaged in the care of COVID 19 patients in the operating theatre in tertiary healthcare facilities in Port Harcourt.

Background: Staggering statistics of morbidity and mortality have been reported on COVID-19 disease in different countries on a global scale, and healthcare providers, including operating theatre staff, are not spared in the line of duty.

Materials and Methods: This cross-sectional descriptive study was carried out at two multispecialty tertiary healthcare facilities in Port Harcourt, Nigeria, among all categories of theatre users. The convenience sampling method was used to administer 156 semi-structured questionnaires to study participants. Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.0. with chi square using ≤ 0.05 to determine level of significance.

Results: One hundred and thirty-four (85.9%) respondents were aware of Coronavirus before the study. One hundred and forty-six (93.6%) respondents knew about mode of transmission and 144 (92.3%) also had knowledge of preventive measures. One hundred and forty-three (91.7%) respondents stressed that they did not have adequate needed materials to work at duty their post. Thirty-one (42.5%) males felt like running away from duty, as against 17 (20.5%) females.

Conclusion: There was a high awareness of the pandemic among theatre staff, with a corresponding significant knowledge of mode of transmission and preventive measures. The attitude of theatre staff to work and to patients was affected during the COVID-19 pandemic.

Keywords: COVID 19; Coronavirus; The Surgical Operating Theatre; Port Harcourt; Nigeria.

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I. Introduction

The surgical operating theatre and endoscopy suites are peculiar places in a hospital where invasive diagnostic and therapeutic procedures are carried out on patients, and hence issues of infection control and occupational hazards are key to prevent infection transmission from patient to theatre staff and vice versa, and injuries to theatre users.¹⁻⁴ This is evident in the design of modern operating theatre and endoscopy suites;⁵⁻⁷ practice of universal / standard precautions (like use of aprons, boots, gloves, face masks, eye protectors, and theatre caps);^{8, 9} operating theatre ethics;¹⁰ operating room ventilation systems;^{11, 12} medical waste disposal;¹³ etc. Use of operating surgical theatre and endoscopy suites in the COVID 19 era not only requires that consideration on these issues be intensified, but also places extra demands on the surgical specialties for adaptations to curb the furtherance of the highly infectious COVID 19 disease.¹⁴⁻¹⁶

Staggering statistics of morbidity and mortality have been reported on COVID 19 disease in different countries and on a global scale,^{17, 18} and healthcare providers are not spared in the line of duty.¹⁸⁻²¹ The pathogenesis of COVID 19 disease is primarily a respiratory disease that is transmitted through aerosols.^{22, 23} More worrisome is the fact that it also has been reported to be shed in stool, raising concern of its transmission through oral and fecal effluents.²⁴⁻²⁶ Though there is no consensus on measures to take to protect the patient and theatre users from the disease, a guide and some recommendations have been developed for preoperative, perioperative and postoperative care in the event of this disease.^{27, 28}

In centers that have cases of COVID 19 disease, coping strategies for operating theatre include applying the general rules for COVID 19 and scaling down of activities in the clinics and wardsexcept for emergencies, with or without using a scoring system for triage.^{15, 29-31} Patients who are medically fit to leave were discharged from hospital, refresher training were conducted and personal protective equipment (such as a well-fitting N95 mask, goggles or face shield, splash-resistant gown, and boot covers) were deployed.^{15, 32}

Several strategies have been developed and documented in the surgical sub-specialties as measures for use in the operating theatre in the care of potential or actual COVID 19 disease patients: these measures vary for anesthesia and intensive care;³³⁻³⁵ Ophthalmology;³⁶ neurosurgery;³⁷⁻³⁹ ear, nose, and throat surgery;⁴⁰ cardiothoracic and vascular surgery;^{41, 42} obstetrics and gynecology;⁴³⁻⁴⁵ orthopedic surgery;^{46, 47} urology;⁴⁸ endoscopy;⁴⁹⁻⁵¹ laparoscopy and robotic surgery;^{52, 53} and surgical oncology.^{54, 55} Apart from hand washing, use of hand sanitizers, social distancing which are known to the public, the nuances of care of COVID 19 patients or suspected patients in the operating theatre environment is a concern to theatre users due to potential high degree of infectivity. The potential shortage or lack of operating theatre consumables that has been an issue of concern in the low-income setting, can only be made worse in an instance of actual or potential case of COVID 19 disease that could put additional strain on the health system in a low-income setting.

The issues seem to be myriad:^{56, 57} fear of the unknown in an environment of inadequate tool; uncertainty of what the protocol should be while working with fairly inadequate needed working tools; news of patients concealing their true symptoms and consequent massive involvement of health workers; suspicion of who and who is not a potential COVID 19 patient; fear of what the consequence of absconding from duty will be at this critical time, etc. are potential problems facing operating theatre users. The aim of this study was to investigate the knowledge, attitude of operating theatre users and challenges envisaged in the care of COVID 19 patients in the operating theatre in tertiary healthcare facilities in Port Harcourt. We set out by asking the following research questions: What is the scope of knowledge of theatre users on COVID 19 disease in the surgical operating theatre in tertiary health facilities in Port Harcourt from April to May 2020? What are the opinions and attitude of operating theatre users on COVID 19 disease and operating theatre in tertiary healthcare facilities in Port Harcourt from April to May 2020? What are the challenges envisaged in the care of COVID 19 disease patients in the operating theatre in tertiary healthcare facilities in Port Harcourt from April to May 2020?

II. Materials and Methods

Study Design: The cross-sectional descriptive study (a survey).

Location: The University of Port Harcourt Teaching Hospital, and the Rivers State University Teaching Hospital – both are tertiary healthcare facilities in Port Harcourt, the capital of Rivers State, South-South of the Federal Republic of Nigeria. Surgeries performed in these government owned tertiary health facilities include but not limited to general surgical, neurosurgical, otorhinolaryngologic, dental/oral-maxillo-facial, plastic surgical, cardiothoracic, orthopedic, obstetric and gynecologic, urologic, pediatric surgical, and laparoscopic surgical procedures.

Study Population: Operating theatre users (surgeons of all specialties, anesthetists, theatre nurses, other staff).

Study Duration: May 2020

Sampling Method: The convenience sampling method

Sample size: 156 surgical operating theatre workers.

Sample size calculation: Nil

Inclusion criteria: All theatre users on duty who gave their consent were included and given a questionnaire.

Exclusion criteria: All theatre workers who were too busy, attending to critical patients.

Procedure methodology: After obtaining approval of the research ethics review committee of the University of Port Harcourt Teaching Hospital (UPTH) and the Rivers State University Teaching Hospital (RSUTH) in the month of April 2020, the study was carried out in May 2020. A written informed consent was obtained from the surgical operating theatre workers, and a well-designed questionnaire was used to collect the data for the study. The questionnaire included information on socio-demographic characteristics; knowledge of theatre users on COVID-19 pandemic; opinions and attitude of operating theatre users on COVID-19 disease and operating theatre; and the challenges envisaged in the care of COVID-19 disease patients in the operating theatre. The obtained data was analyzed with SPSS. The study was self-sponsored by the researchers with no conflict of interest.

Statistical Analysis: Data was analysed using the Statistical Package for the Social Sciences (SPSS) version 20.0. with chi square using ≤ 0.05 to determine level of significance.

III. Results

A total of 156 respondents who are doctors, nurses, students, and technicians were included in this survey. The demographic characteristics of the respondents summarized in Table 1.0 indicated that 73(46.8%) were males and 83(53.2%) were females. Eighty-four (53.8%) respondents were between 25 and 40 years of

age. One hundred and seven (68.6%) respondents were married. Fifty-one (32.7%) respondents had spent between 11- 20 years in service. Seventy-nine (50.6%) respondents were nurses and 43(27.6%) were Surgeons (all specialists). Sixty-five-point four percent worked at University of Port Harcourt Teaching Hospital while 34.6% worked at Rivers State University Teaching Hospital.

Respondents' knowledge of Coronavirus pandemic was assessed. One hundred and thirty-four (85.9%) respondents were aware of Coronavirus before the study. While ninety-seven (62.2%) respondents got information about coronavirus through Television/Radio/Newspaper, and 17(10.9%) were through the social media. One hundred and thirty-four (85.9%) respondents described coronavirus pandemic as a disease caused by germ imported from china, while 6.4% felt it was a 5G end time anti-Christ disease. One hundred and forty-six (93.6%) respondents asserted that coughing and sneezing by infected person, shaking hands, touching contaminated surfaces and being in public gathering were ways that someone can be infected by coronavirus. One hundred and forty-four (92.3%) respondents indicated that avoiding hand-shake, touching surface in public places, and public gatherings; washing hands, and using hand sanitizers were preventive measures for coronavirus disease. Other preventive measures mentioned by respondents were social distancing – 46 (29.5%), wearing face mask 14(9.0%), staying at home 20 (12.8%), personal hygiene 38 (24.4%) and boosting ones' immune system 9 (5.8%).

Sixty-four (41.0%) respondents asserted that there were COVID-19 operating theatre control measures in-place, while 57(36.5%) stressed that there were none. Thirty-five(22.4%) respondents were not sure of any. Correspondingly, 50 (32.1%) respondents were aware of operating theatre control measures, while 81 (51.9%) respondents were not,(see Table 3.0.) but asserted that they were not in place. Seventy-three (46.8%) respondents asserted to knowledge/availability of COVID-19 strategies for individual surgical subspecialty or nursing, while 46(29.5%) stressed that there was none, and 37 (23.7%) did not know.

Opinions and attitude of theatre users on coronavirus disease was evaluated (see Table 4.0). Although 38(24.4%) respondents believed that the patients that come to the hospital during the coronavirus period are at high risk of the disease, 30(19.2%) were also concerned about false information that patients could give to conceal their COVID19 status. However, 82 (52.6%) health workers asserted that the patients that come to the hospital during the coronavirus period were not only at high risk of the disease, but also cannot be trusted and that they give false information to conceal their COVID-19 status. One hundred and forty-three (91.7%) respondents stressed that they did not have adequate needed materials to work at duty their post. The lack/inadequacy of materials as reported by health workers include: face masks- 17 (10.9%), gloves – 6 (3.8%), face shield - 3.2%, full personal protective equipment (PPEs) – 66 (42.3%), and 59 (37.8%) respondents stressed insufficiency in all of the above-mentioned items. One hundred and forty-four (73.1%) respondents had fear of COVID-19 that they considered as very bad. Despite that, only 30.8% felt like running away from work, while 90 (57.7%) respondents did not feel so. Eighty-six (55.1%) respondents were certain about life with this coronavirus pandemic while 40 (25.6%) were indecisive (see Table 4.0).

Table 5.0 presented the challenges imagine and fear in the minds of respondents during the pandemic. It showed that 147 (94.2%) respondents were concerned about attending to COVID-19 patients without knowing, 136(87.2%) were worried about not having adequate personal protective equipment (PPEs), 122(78.2%) had challenges of staff shortage for numerous reasons, and 124 (79.5%) asserted their issues of material shortages. These challenges come with fears as 118 (75.6%) theatre worker expressed fear of being infected with the coronavirus, 130 (83.3%) had fear of transferring COVID-19 infection to their family members, 124 (79.5%) fear of possible financial problems due to prolong lockdown, and 117 (75.0%) were fearful of the unknown. The relationship between “the feeling like running away from work” and “Material / infrastructure shortage” is presented in Table 6.0. Seventy-one (57.3%) of those who had material / infrastructure shortage were never considering running away from work. Thirty-one (42.5%) males felt like running away from duty, as against 17 (20.5%) females.

Table no 1: Socio-demographic characteristics of respondents

S/No	Variables	Options	Frequency	%
1	Sex	Male	73	43.8
		Female	83	53.2
2	Age (Years)	< 25	5	3.2
		25 - 40	84	53.8
		41 - 60	52	33.3
		> 60	15	9.6
3	Marital Status	Single	45	28.8
		Married	107	68.6
		Separated	2	1.3
		Divorced	2	1.3
4	Years in service	< 1	24	15.4
		1 - 10	40	25.6
		11 - 20	51	32.7

		21 - 30	25	16.0
		> 30	16	10.3
5	Health staff category	Surgeons (All Specialists)	43	27.6
		Anaesthetists	9	5.8
		Nurses	79	50.6
		Students	3	1.9
		Others	22	14.1
6	Department in the hospital	Accident and emergency theatre	15	9.6
		Intensive care unit	6	3.8
		Other surgical operating theatres	110	70.5
7	Place of work (Hospital)	UPTH	102	65.4
		RSUTH	54	34.6

Table no 2: Knowledge of theatre users on Corona Virus pandemic

S/No	Variables	Sub-variables	Options	Frequency	%
1	Heard about Corona virus before	-	Yes	134	85.9
			No	20	12.8
			I don't Know	2	1.3
2	Source of information about Corona Virus Disease	Hospital	-	18	11.5
		Television/Radio/Newspaper	-	97	62.2
		Hospital and media (TV/Radio/Newspaper)	-	24	15.4
		Social media	-	17	10.9
3	What is Corona Virus Disease?	A 5G end time anti-Christ disease	-	10	6.4
		A disease caused by germ imported from China	-	134	85.9
		Don't know	-	12	7.7
4	How someone can be infected corona virus	Through coughing and sneezing by infected person		5	3.2
		By shaking hands		2	1.3
		By touching contaminated surfaces		1	0.6
		From public gathering		2	1.3
		All of the above		146	93.6
5	How to prevent corona virus disease	Avoid shaking hands		3	1.9
		Avoid touching surface in public places		1	0.6
		By washing hands and using hand sanitizers		7	4.5
		Avoid public gathering		1	0.6
		All of the above		144	92.3
6	Other ways to prevent corona virus disease	Social distancing		46	29.5
		Wearing face mask		14	9.0
		Staying at home		20	12.8
		Personal hygiene		38	24.4
		Boost ones' immune system		9	5.8
		None		29	18.6

Table no 3: COVID-19 operating theatre control measure

S/No	Variables	Sub-variables	Options	Frequency	%		
1	Any COVID-19 operating theatre control measure	-	Yes	61	41.0		
			No	57	36.5		
			I don't Know	35	22.4		
2	COVID-19 operating theatre control measures	Increased capacity for anticipated increased influx of COVID 19 patients	-	-	3	1.9	
			Social media theatre communication and staff support	-	-	11	7.1
			operating room with a negative pressure environment is ideal to reduce dissemination of the virus beyond the OR	-	-	1	0.6
			Separate operating room for COVID 19 cases	-	-	3	1.9
			Designated areas exist for donning and doffing of PPEs	-	-	2	1.3
			Use of COVID-19 infection prevention PPEs	-	-	5	3.2
			All of the above	-	-	50	32.1
			None of the above			81	51.9
3	Any COVID19 Strategies for individual surgical subspecialty or nursing	-	Yes	73	46.8		
			No	46	29.5		
			I don't know	37	23.7		

Table no 4: Opinions and attitude of theatre users on Corona Virus disease

S/No	Variables	Options	Frequency	%
1	Opinion about patients that come to the hospital during the corona virus period	They are at high risk of the disease	38	24.4
		They are not to be trusted	4	2.6
		Patients give false information to conceal their COVID-19 status	30	19.2
		All of the above	82	52.6
		None of the above	2	1.3
2	Do you have needed materials to work with at duty post?	Yes	4	2.6
		No	143	91.7
		I don't know	9	5.8
3	Materials lacking at duty post	Face Masks	17	10.9
		Gloves	6	3.8
		Face shield	5	3.2
		Full PPEs	66	4.3
		Face Masks, gloves, face shield and full PPEs	59	37.8
		Have needed materials	3	1.2
4	Do you have direct contact with patients?	Yes	94	60.3
		No	42	26.9
		I don't know	20	12.8
5	How bad is the fear of COVID-19?	Very bad	114	73.1
		Bad	35	22.4
		Not sure	7	4.5
6	Do you feel like running away from work?	Yes	48	30.8
		No	90	57.7
		Not sure	18	11.5
7	Are you certain about life with this coronavirus pandemic?	Yes	86	55.1
		No	30	19.2
		Not sure	40	25.6
8	What do you wish to happen in the COVID-19 pandemic?	Hospital and government should act fast	56	35.9
		The pandemic should just go away	30	19.2
		We should begin to see evidence of palliative measures for health workers	45	28.8
		All of the 1-3 above	15	9.6
		Increase hazard allowance and employ more staff	6	3.8
Don't know	4	2.6		

Table no 5: Challenges imagine and fear that dominate mind during the pandemic

Variables	Options	Yes		No	
		Freq	%	Freq	%
Challenges imagine at duty post	Attending to Covid19 patient without knowing	147	94.2	9	5.8
	Not having adequate personal protective equipment (PPE)	136	87.2	20	12.8
	Staff shortage for numerous reasons	122	78.2	34	21.8
	Infrastructure shortage	124	79.5	32	20.5
Fear that dominate mind during the COVID19 pandemic	Fear of being infected with the corona virus	118	75.6	38	24.4
	Fear of transferring infection to the family members	130	83.3	26	16.7
	Fear of possible financial problem due to prolong lockdown	124	79.5	32	20.5
	Fear of the unknown	117	75.0	39	25.0

Table no 6: Relationship between feeling like running away from work and Infrastructure shortage

Feel like running away from work						
Infrastructure shortage	Yes	No	Don't know	Total	(X ²)	P-Value
Yes	36(29.0%)	71(57.3%)	17(13.7%)	124	3.082	0.214
No	12(37.5%)	19(59.4%)	1(3.1%)	32		
Total	48	90	18	156		

Table no 7: Relationship between feeling like running away from work and gender

Feel like running away from work						
Gender	Yes	No	Don't know	Total	(X ²)	P-Value
Male	31(42.5%)	32(43.8%)	10(13.7%)	73	11.222	0.004
Female	17(20.5%)	58(69.9%)	8(9.6%)	83		
Total	48	90	18	156		

IV. Discussion

The respondents cut across all strata of the workforce domicile in the operating theatre, majority of whom were married and about half of the them were between 25 and 40 years. This shows that participants fall into different social classes, holding responsibilities with dependants, as usual in the low-income society.

There was significant awareness of the pandemic among the theatre staff, with their main source of information being Television/Radio/Newspaper, as also observed in an earlier studies in Nigeria.^{58, 59} Most of the respondents had a good knowledge of the mode of transmission and preventive measures. This finding of this study is similar to that done by other researchers in Nigeria in which respondents were able to identify mode transmission and preventive measures.⁵⁸⁻⁶⁰ This knowledge level is expected considering the scary picture of mortality and morbidity that is associated with that coronavirus pandemic in China and some climes where the disease ravaged the population. The awareness could be viewed as a protective measure by the workers. However, while majority described coronavirus pandemic as a disease caused by imported germ, a few respondents harboured concerns of the myth of association with 5G and the anti-Christ.

Less than half of the respondents agreed to availability of COVID-19 operating theatre control measures in their workplace, while most others asserted otherwise. Majority of respondents were also aware of what should be the response strategies peculiar to their specialties, which were not being applied. This finding is similar to the report coming from another centre in Nigeria.⁶¹ This brings to the fore part of the reasons for the fear of COVID-19 among theatre staff, and the possible justification for the “run-away-attitude” of some staff. There were more men than women who had the urge to run-away from duty due to the coronavirus pandemic. The possible reason for this sex difference in attitude could be that the most men in African society are bread winners and so cared about the survival of their household during the pandemic.

Theatre users opined that patients conceal their symptoms and so every patient for surgery was high risk for coronavirus disease. Another concern expressed by majority of respondents was lack/inadequacy of materials needed COVID-19 prevention in theatre. This concern has been reported even in developed economies, made worse in our low-income setting. Apart from the aforementioned information concealment by

patients, inadequacy of personal protective equipment, staff shortages and fear of being infected with the coronavirus contributed to fuelling the fear of COVID-19 in our setting, considered as very bad by majority of theatre workers. Similar concern has been raised by another researcher.⁶² It may also explain why some theatre workers nursed the thought of running away from their duty post.

Although the relationship between “running away” and “inadequacy of materials” was not statistically significant when plotted against each other, it underscores how committed the workers were, despite potential hazard exposing conditions. Besides, it appears female were more committed than male, as the proportion of males who felt like running away from work were more than that of females, and proportion of female who are ready to continue working despite unpleasant situation was more than that of male and this relationship was statistically significant. However, this gender-based result may be by chance.

Limitations of this study is that it is a questionnaire-based study with convenience sampling method.

V. Conclusion

There was a high awareness of the COVID-19 pandemic among theatre staff, with a corresponding good knowledge of mode of transmission and preventive measures. Operating theatre workers feel that, like the rest of the hospital community and the general public, they are exposed to the risk of coronavirus infection. The attitude of theatre staff to work and to patients was affected during the COVID-19 pandemic, and it was triggered by potential fear of infection in a background of uncertainty and inadequacy COVID-19 personal protective equipment/materials. Operating theatre strategies as outlined for the different surgical specialties should be implemented in our operating theatres, and adequate / appropriate personal protective equipment and materials should be made available to workers in operating theatre to enable them protect themselves and put their knowledge to practice during this coronavirus pandemic.

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