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Research Article

Evaluating Infection Control Practice among Dental Professionals in Private Dental Clinics in Douala during Covid-19 Pandemic

Lingondo Simon Mwambo [1], Dr Forcham Emmanuel Duna[*]

1) BDSC, M.A, MSc., MPS (Oral Surgery), CAIE, CDS, PGCERT (Applied and Computational Mathematics).

[*]**Correspondence to**: Dr Forcham Emmanuel Duna Senior Lecturer, researcher and HND Exam Coordinator. Address : Catholic University of Cameroon, Bamenda, school of health and medical sciences and university of Buea, department of microbiology and parasitology.

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ABSTRACT

BACKGROUND: Infection control measures refer to policies and procedures use to minimize the risk of spreading infection especially in hospital and human or animal health care facilities. Although there is evidence that many private dental clinics suffer from cross infection that can occur during dental procedure, there is still insufficient literature on it control measure in Douala. Aim: The purpose of this study was to assess infection control practice among private dental professionals (PDPs) in Douala during COVID-19 pandemic.

MATERIAL AND METHOD: A retrospective study was conducted and private dental professionals were approached through a convenient sampling technique in health structure in Douala from the 11th MAY to the 10th JUNE 2022. 154 dental professionals in private dental clinics gave consent to participate in this study. Data was collected using close-ended questionnaires that was translated in French to facilitate easy understanding since we are in the French-speaking zone and was analyzed using EPI infos version 3.5.1

Result: Infection control practices among dental professionals in Douala1 during COVID-19 pandemic was up to standard. 105(81.5%) participants tell patients to used hand sanitizer before getting into the dental clinic, 110(85.2%) wear examination gloves when consulting, 98(75.9%) wear face shield and face mask before any dental procedure. 64(49.61%) changed face mask after each patient ,80(60%) give mouth wash to their patient before any dental procedure, 112(87.0%) clean and disinfect ultrasonic scalar and hand pieces ,105(81.5%) clean and disinfect dental chair after each patient, 117 (90.7%) ventilate the clinic during any procedure by opening windows 65(50.4%) to ventilate, 91(70.4%) wear PPE, disinfected surfaces, sterilized instruments to avoid cross infection before and after each patients, 80(60%) changed their lab coat after two days, 122(94.3%) had safety box for sharp instruments disposal, 105(81.5%) used dry heat as sterilization method.

Conclusion: Infection control measures during COVID -19 pandemic among dental professionals was respecting the CDC guidelines and Practice of infection control was up to standard as guideline for dental settings in Douala.

Key words: Practice, infection control measures, coronavirus 19, private dental professionals

INTRODUCTION

1.1 BACKGROUND

Dental care has become challenging with the emergence of new diseases that are very contagious and fatal. From tuberculosis to hepatitis, HIV/AIDS and new corona virus infection control measure cannot be over emphasized. The oral health care givers is expected to exposed themselves to harm and at same time not to harm the patient. Many communicable diseases have been part of global emergency and re-emergency. Globally, 99.7% of oral health care workers implement infection control procedures, most commonly disinfection, sterilisation, COVID-19 screening, social distancing, and wearing face masks. Most practicing dentists (72.8%) used personal protective equipment (Estrich et al., 2020). According to interim guidance from the Centers for Disease Control and Prevention oral health-care workers (HCWs) and dental patients had already been reported to have contracted diseases including Mycobacterium tuberculosis, hepatitis B and C virus (HBV and HCV), Legionella pneumophila, human immunodeficiency virus, and other microorganisms originating from the oral and respiratory (Benedict Odhiambo Otieno1, Eunice Njeri Kihara and Bernard Nzioka Mua1, 2020).

Cross-infection control has always been a prime importance in the hospital, it is considered as gold standard not only for patient safety but also for dentist and their staff. In the light of current COVID-19 pandemic, ADC and CDC guidelines for cross-infection control have changed (source: ADA-COVID-19 Resources for Dentists) (Bizzoca ME, Campisi G, Muzio LL, 2020). Cross-infection transmission occurs during dental treatment (66%) involving blood, saliva, and procedures generating aerosols. These aerosols remain suspended in air for a quite reasonable time and could possibly be a substantial source of infection in case of treating infected patient. (Bizzoca ME, Campisi G, Muzio LL, 2020). COVID-19 has the potential to cause severe acute respiratory tract infection among infected humans and is commonly transmitted from person to person via hands, saliva, nasal droplets, and surface contacts (Ahmed et al., 2020).

The dental professionals and practices have the potential to spread the disease to the population unknowingly, if the precautions are not being strictly followed (Sarfaraz et al., 2020). SARS-CoV-2 transmission during dental procedures can therefore happen through inhalation of aerosol/droplets from infected individuals or direct contact with mucous membranes, oral fluids, contaminated instruments and surfaces. Given the exposure risk for different working categories, dental professionals are the workers facing the greatest coronavirus risk (R EZZERTI, 2020). In the beginning of this COVID-19 outbreak, mostly dental services were closed or restricted to emergency treatment only because of lack of proper guidelines for COVID-19

infection control, fear and anxiety among dental professionals. By the passage of time, people have realized that they have to live with coronavirus disease until COVID-19 vaccine is available; therefore, life is resuming to normal with certain modification such as social distancing, wearing facemask, avoiding gatherings, and caring of hand hygiene through frequent washing or sanitization. (Bizzoca ME, Campisi G, Muzio LL, 2020). Hence, in Cameroun, little is still known about infection control practice among private dental professionals during COVID-19 pandemic in Douala.

The purpose of this study is to evaluate infection control practice among private dental professionals during COVID-19 pandemic in Douala, assess their knowledge with respect to COVID-19 guideline, evaluate their practice of infection control, determine the level of exposure of dental professionals, nosocomial infection and assess the role dentist in Douala play to stop the spread of the disease using infection control measures.

1.2 STATEMENT OF THE PROBLEM

Private dental clinics have a profit-making approach toward practice rather than humanitarian only. They always want to make profit over cost and this may influence less investment they make in infection control measures, especially as COVID-19 infection demands more than usual, therefore it could be shortcoming or laxity in compliance to standard of infection control by health care personnel in private dental clinics in Douala. For this purpose, acquiring updated knowledge regarding infection control measure and disinfection during the current pandemic is necessary for every dental professional.

1.3 SIGNIFICANCE OF THE STUDY

There is a general tendency for patient to avoid health facilities during the outbreak of a very virulent and fatal disease for fear of nosocomial infection. This is the case during COVID-19 pandemic in Douala, identifying the shortcoming of infection and correcting them will reassure patient and general public in Douala about the safety of dental practice as COVID-19 is yet to be eradicated.

1.3 RESEARCH OBJECTIVES

1.3.1 General Objectives

The purpose of the study was to evaluate the practice of infection control in private dental clinics in Douala with respect to COVID-19 guidelines as prescribe by Centre of Disease Control

1.3.2 Specific objectives

- To assess if the practice of infection control during COVID-19 pandemic was up to standard in private

dental clinics in Douala.

- To assess the application of COVID-19 infection control recommended guidelines in private dental clinics in Douala.

1.4 RESEARCH QUESTIONS

1.4.1 General Research Question

How did private dental clinics in Douala practice infection control during COVID-19 pandemic?

1.4.2 Specific Research Question

- To evaluate if the practice of infection control during COVID-19 pandemic was up to standard in private dental clinics in Douala?
- Are dental clinics practicing infection control guideline for dental setting in Douala?

1.5 RESEARCH HYPOTHESIS

Could insufficient infection control practice in private dental clinics in Douala be a deterrent to dental visits and treatment during COVID -19 out break?

1.6 SIGNIFICANCE OF THE STUDY

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1.7 DEFINITION OF TERMS AND CONCEPT

Infection control: Refers to measure practiced by health care personnel to reduce the risk of transmission of infectious agents to patient and employers or the preventives measures that aim to ensure the protection of those who might be vulnerable to acquire an infection both in the general community and while receiving care due to health issue.

Practice: Is a method, procedure, process or rule use in particular field or profession or action rather than though or idea.

Coronavirus: Also known as COVID-19 is an ss-RNA, enveloped virus with a size of ~350 kilo base-pair (kbp) is contagious disease that causes a severe acute respiratory syndrome 2 (SARS-CoV-2).

Dental professionals: This are health care personnel who are qualify to treat the disease and condition affecting the mouth, jaw, teeth and gums.

1.8 LIMITATIONS

Time period in which this study was done was a very clear limitation as it prevented certain participants from participating in this study. The sensitive nature of this study caused some potential participants to turn down their consent to participate.

MATERIALS AND METHODS

2.1 STUDY AREA

This study was carried out in Douala which is the largest city in Cameroon and its economical capital. It covers an area of 41 000 ha = 410 km2 and has a population of 3 793 000 inhabitants. The city of Douala is divided into seven districts (Akwa, Bassa, Bonabéri, Bonapriso, Bonanjo, Deïdo and New Bell) and it has more than 120 neighborhoods. The climate is mostly hot and humid there than cold.

2.2 STUDY DESIGNS

A Retrospective study design was used to carry out the research study because it easy, cost effective to perform and can be done within a short time interval, study variables can be obtained or collected at once.

2.3 STUDY POPULATION

The study concern dental professionals in private clinics in Douala.

Inclusion criteria

All private dental clinics in Douala that was willing to participate in the study.

All private dental clinics who was present within the study time

Exclusion criteria

The private dental clinics who withdraw before the end of the study.

All Public dental facility in Douala.

All private dental clinics that was not present within the study time.

2.4 SAMPLE SIZE DETERMINATION

Following a study carried out by (Karimi, S. D.) In Pakistan on infection control practice, his number of

participant was 140. The sample size was calculated using Slovin's formula

$n= N/1(1+N (e)^2)$

Where,

n= estimated sample size

e= error margin

N= population size = 100-95= 5

Therefore 5% = 5/1= 0.05%

$n= 140/1(1+140(0.05)^2)$

=154

However, we could not meet up with the sample size which were 154 but we have the sample size of 129 participant. This is because the duration of the study was for 1 month and also many participants refused to participate within the study time

2.5 SAMPLING PROCEDURE

Non-probabilistic sampling method was used, participants was chosen using convenient sampling techniques because the study was carried out on available private dental professionals in Douala.

2.6 DATA COLLECTION PROCEDURE

Study variables

Infection control practices

Data collection tools

Data was obtained by giving out questionnaire, data collection form was used for the study and distributed to the participant.

Pretesting of data collection tools

Sample questionnaire was given to participants reflecting the study population to evaluate the understanding of questions.

2.7 DATA COLLECTION PROCEDURE

Clearance was be obtained from the regional delegation of public health littoral. The school administration. The various hospital where the research was carried out.

Pretesting of questionnaire was done on participant reflecting the study population in other to evaluate understanding of questions and determine the time needed to answer the questionnaire. After final modification, the self-administered questionnaires were distributed to participants by the principal investigator (PI).

The principal investigator was data collector of this study and was trained by his supervisor.

The principal investigator was moving to the various hospital, introduce her selves to each participant, explain the goal of the study and they could come in.

Few minutes was accorded to potential participant in case they have questions or need clarification in regard to this study. When this was done, the participant signed the consent form to demonstrate his or her willingness to participate in the study.

The questionnaire was strictly confidential and the answer questionnaire was kept cautiously to be analyse for result.

2.8 DATA MANAGEMENT

Training was done in other to understand the concept

Generate tools for data management

Collect the data

Data was checked for completeness, analyzed, coded and saved in Microsoft word 2007 and in a USB flash drive.

2.9 DATA ANALYSIS

Data was input in Microsoft word 2007 and analyzed using EPI Infos.

The results obtained was presented in form of tables and charts.

2.10 ETHICAL CONSIDERATION

Ethical clearance and approval were obtained from school authority of Havard Higher University Institute of Science and Technology, Bamenda. An authorization was obtained from the Districts enrolled for this study and a participant's consent was given to sign as an agreement outlining their roles and responsibilities to participate in the study.

2.11 EXPECTED OUTCOME

To assess if the practice of infection control during COVID-19 pandemic was up to standard in private dental clinics in Douala and if they actually followed the Centre of Disease Control guidelines.

RESULTS

A total of 129 Oral health care givers from 42 dental clinics or structures in the city of Douala participated in this study. They responded to self-administered questionnaires.

3.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

Table 1 shows the demographic presentation of study respondents sex, qualification and work experience

Variables		Frequency(n=)	Percentage %
SEX;	**Male**	57	44.4
	Female	72	55.6
Qualification;	**Dental surgeon**	39	30.5
	Dental therapist/technician	64	49.5
	Dental assistant	26	20
Work experience	**1-5yrs**	64	49.5
	6-10yrs	37	28.5
	11-20yrs	18	14.3
	21-30yrs	7	5.7
	Above 30yrs	2	2.0

From the results of this table above, majority 72(55.6%) of participants were female against minority 57(44.4%) who were male. 64 (49.5%) were dental therapist/technician while 26 (20%) were dental assistant. Majority of participant had work experience 1-5 year 64 (49.5%) while 2 (2%) were above 30 years.

3.2 TRIAGE AND SCREENING

Table 2 shows triage and screening of everyone entering the dental clinic

VARIABLES		FREQUENCY(N=)	PERCENTAGE%
OBLIGATORY HAND SANITIZATION BEFORE GETTING INTO THE CLINIC?	No	24	18.5
	Yes	105	81.5
WHEN CONSULTING DO YOU WEAR EXAMINATION GLOVES?	No	19	14.8
	Yes	110	85.2
OFFER MOUTHWASH BEFORE PROCEDURES	Yes	80	62
	No	49	38
DO YOU WEAR FACE SHIELD AND FACE MASK BEFORE ANY DENTAL PROCEDURE?	No	31	24.1
	Yes	98	75.9
HOW OFTEN DO YOU CHANGE YOUR FACE MASK?	At the end of the day	17	13.1
	When I get dirty	22	17.2
	At the end of the week	26	20.1
	After each patient	64	49.6
HOW DO YOU HANDLE HAND PIECE AND ULTRASONIC SCALAR?	Disinfect after each patient	10	7.4
	Clean after each patient	5	3.7
	Clean and disinfect after each patient	11	87.0
	at the end of the day	2	1.9
HOW DO YOU HANDLE DENTAL CHAIR?	Disinfect after each patient	14	11.1
	Clean after each patient	20.5	5.6
	Clean and disinfect after each patient	105	81.5
	Clean and disinfect at the end of the day	2	1.9

From the results of table 2 above, 105(81.5%) of participants tell patients to used hand sanitizer before getting into the dental clinic, majority 110(85.2%) wear examination gloves when consulting. Majority 80(62%) offered mouth wash before procedure. Majority of participants 98(75.9%) wear face shield and face mask before any dental procedure. Majority of participants 64(49.61%) changed face mask after each patient against minority 17(13.19%) who changed when it at the end of the day. Majority of participants 112(87.0) clean and

disinfect ultrasonic scalar and hand pieces while minority 2(1.9%) clean at the end of the day. Majority of participants 105(81.5%) clean and disinfect dental chair after each patient while minority 2(1.9%) clean and disinfect at the end of the day.

3.3 INFECTION CONTROL MEASURES IN DENTAL SETTINGS

Table 3 shows infection control measures among study participants in dental settings

Variables		Frequency (n=)	Percentage%
Do you ventilate the clinic during any procedure?	No	12	9.3
	Yes	117	90.7
What do you use to ventilate?	Fan	12	9.3
	open windows	65	50.4
	air conditioner	52	40.3
What do you do to avoid cross infection before and after each patient?	disinfect surfaces	26	20.4
	dental chairs disinfection and use of PPE	12	9.2
	wearing PPE, surfaces disinfection, sterilization of instruments	91	70.4
How often do you change your lab coat?	After two days	80	60
	when it gets dirty	19	15
	at the end of the week	30	25
Are there special containers for waste disposal in your clinic?	No	12	8.4
	Yes	117	92.6
How do you manage sharp instruments after a procedure?	safety box	122	94.3
	in a plastic bag	7	5.7

What type of sterilization method do you use?	dry heat	105	81.5
	steam	24	18.5

From the results of the table 3 above, majority of participants 117 (90.7%) ventilate the clinic during any procedure. Majority of participants open windows 65(50.4%) to ventilate while 12(9.3%) used fan to ventilate. Majority of participants 91(70.4%) wear PPE, disinfected surfaces, sterilized instruments to avoid cross infection before and after each patients while minority 12 (9.2%) used PPE and disinfect dental chair. Majority of participants 80(60%) changed their lab coat after two days while minority 19(15%) changed when it get dirty. Majority of participants 122(94.3%) had safety box for sharp instruments disposal while minority 4(7.4%) were using plastic bag. Majority of participants 105(81.5%) used dry heat as sterilization method against 24(18.5%) who used Steam as sterilization methods.

3.4 INFECTION CONTROL MEASURE

3.4 a) Infection control measure remark

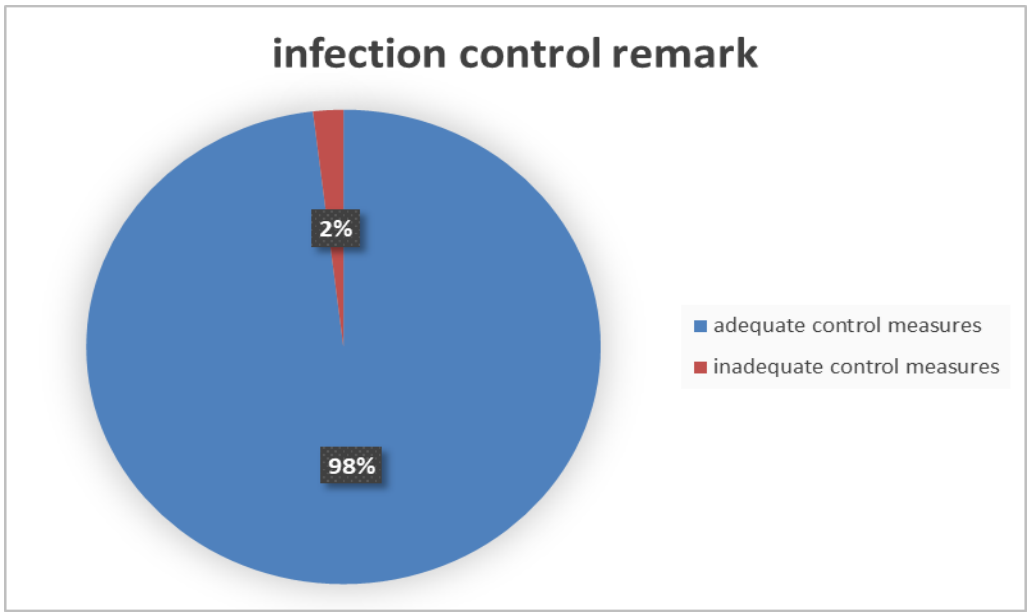

Figure 1: Infection control remark

Figure above shows the general infection control measures and it shows that 126(98%) do take adequate control measures while 3 (2%) do not.

4.4.b) Infection control practice remark

Figure 2: Infection control practice remark

From the above figure, it shows 126 (98%) of the population do have a good practice for infection control in dental clinics and 3 (2%) has poor practicing styles.

3.4 ASSOCIATION BETWEEN INFECTION CONTROL MEASURES AND SOCIO-DEMOGRAPHIC CHARACTERISTICS

Table 4: Associations between infection control measures and socio-demographic characteristics

Variables		**Infection control measures N=**		
		Adequate control measures	Inadequate control measures	P value
qualification	**dental surgeon**	22	1	
	dental therapist	7	-	
	dental technician	16	-	.712
	dental assistant	8	-	
years of experience	**1-5**	26	-	
	6-10	11	-	
	11-20	10	-	.086

21-30	5	1	
30 and above	1	-	
Infection control practice remark			
Good practice	53	0	.019
Poor practice	0	1	

From table 4 above, there is no association between demographic characteristics and infection control measures as there is no P value >0.05. Still on the same table above there is a significant association between the infection control practice and the infection control measures, P=0.019

4.1. DISCUSSION

This study was aimed at assessing practice of infection control measures among oral health care professional in Douala during COVID-19 pandemic. Out of the 154 initial questionnaires to distribute, only 129 were distributed and completely answer because not all dental professionals willing to participate in the study.

Among the 129 participants recruited, it was found that majority were female 72(55.6%) and minority were male 57(44.4%). Majority of participants were dental technicians with 64(49.5%) participants this may be due to the fact that many private dental clinics recruited mostly dental technician. Against the minority, 26(20%). who were dental assistants. Most participants 64(46.5%) were between 1-5 years of working experience while 2 (2.0%) were above 30 years of working experiences.

With respect to the practice of infection control during covid-19 pandemic as according to CDC guidelines, it was found that 105(81.5%) of participants tell patients to used hand sanitizer before getting into the dental clinic. This may be due to the fact they were no hand washing point available and also that hand sanitizer kills certain germs. Most participant 110(85.2%) wear examination gloves when consulting, 98(75.9%) wear face shield and face mask. Majority of participants 64(49.61%) changed face mask after each patient. This might be because they had good knowledge about the new corona virus that is very contagious and fatal. Talking about infection control measures in dental setting, majority of participants 117 (90.7%) ventilate the clinic during any procedure by open windows 65(50.4%) to ventilate may be due to fact that facilitate airflow. Majority of participants 91(70.4%) wear PPE, disinfected surfaces, sterilized instruments and 80(60%) changed their lab coat after each patients. This is to limit cross infection in dental setting. Majority of participants 122(94.3%) had safety box for sharp instruments disposal. Majority of participants 105(81.5%)

used dry heat as sterilization method. This may be due to the fact that dry heat was the sterilization method available in their dental setting. These results were in accordance with the recommendations set by the CDC guidelines, (2016) who reported that used of hand sanitizer, wearing examination gloves, ventilated the clinic, wearing PPE, disinfect surfaces, sterilized instruments and changing lab coat after each patients represents the minimum infection prevention expectations to limit the spread of covid-19 in dental settings and with that of R EZZERTI, (2020).

Talking about practice of infection control measures, 126(98%) of participants had good practice about infection control measures. This might be because they care about both patient and their own well-being. Tis is in accordance with the study carried out by Estrich et al., (2020) in United State who reported that infection control procedures were implemented in 99.7% of dentists' primary practices, most commonly disinfection, COVID-19 screening and wearing face masks also most practicing dentists (72.8%) used personal protective equipment according to interim guidance from the Centers for Disease Control and Prevention. This study was in contrary with a study carried out by Askarian & Assadian, (2009) in Iran who reported that, practice of infection control was poor among DHCPs.

4.2. CONCLUSION

Results from this study indicated that, infection control measures during COVID -19 pandemic dental professionals respected the CDC guidelines and Practice of infection control was up to standard for dental settings in Douala. This work highlights that many dental professionals were adhering to good infection control practice during the COVID-19 outbreak.

4.3. RECOMMENDATIONS

1. The ministry of public health should continuously emphasize on the education, training and recycling of dental health care personnel on infection control.
2. Dental practitioners should organize conferences and debates in order to discuss about the importance of infection control.
3. For researchers, further studies on infection control practices would be of great value in increasing our knowledge and better understanding measures of prevention to be taken.

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Medtronic