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Research Article

COVID-19: Comparison of Vaccination Coverage between Oral Health Care Practitioners and Other Health Care Personnel in Yaounde

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ABSTRACT

Introduction: COVID-19 is a global pandemic for which vaccination coverage is still low in our environment. Health care workers and particularly those in the oral sphere are at high risk of contracting it.

General objective: To evaluate the COVID-19 vaccination coverage among oral health care workers in comparison with other health care workers in Yaounde.

Materials and methods: We conducted a cross-sectional study on 360 individuals in three hospitals in Yaounde, from February to April 2022, i.e., 3 months. All health personnel who gave their free consent consecutively were included. Statistical analysis was performed using SPSS 26.0 software with a statistical significance level of $p<0.05$.

Results: The coverage rate of the COVID-19 vaccine was 34.2%. The rates of vaccination against COVID-19 were 43.3% and 32.2% in oral sphere practitioners and others respectively ($p=0.135$). There was no statistically significant difference in the distribution of vaccine received, adverse events and post-vaccination infection rate against SARS-CoV-2 between our two groups ($p\geq0.05$).

Conclusion: A similar distribution was found between oral health professionals and other health personnel in terms of vaccination rate, type of vaccine received, and post-vaccination adverse events against SARS-CoV-2. Education seems to be a priority action to target the most at-risk populations.

Keywords: COVID-19; SARS-CoV-2; Vaccination; Healthcare workers; Oral sphere

INTRODUCTION

Coronavirus-19 disease (COVID-19) is a highly contagious viral infection caused by the severe acute respiratory syndrome coronavirus (SARS-CoV-2) [1]. Since the first cases appeared in China in 2019, it has been declared a pandemic [1]. To date, more than five hundred million confirmed cases and more than six million deaths worldwide [2], including more than eleven million confirmed cases and two hundred thousand deaths in Africa [2]. In Cameroon, more than one hundred thousand cases have been reported with a case fatality rate of 1.6% [2]. COVID-19 has had a global impact on all areas of activity, particularly the health sector. In 2020, the prevalence of infection with the new coronavirus was 11% among healthcare workers [3]. The disease is mainly contracted by inhalation of the virus from contaminated respiratory droplets and by direct or indirect contact with an infected person [4]. Health care workers are among those most at risk of contracting the disease. Health professionals working in the oral sphere are those whose field of expertise includes the oral cavity, ears, nose and sinuses (otolaryngology (ENT), oral medicine, maxillofacial surgery) [5]. The latter would be the healthcare workers most exposed to the disease due to their proximity to the oral sphere, direct contact with oral fluids and generation of aerosols during healthcare procedures [6]. To counter this public health problem, vaccination has proven to be an indispensable control tool. To date, more than eleven billion doses of vaccine have been administered worldwide, including five hundred thousand in Africa [2]. In Cameroon, the vaccination rate of the general population is 7.7% [7,8]. This value is still low considering the recommendations of the World Health Organization [9]. Since health care workers are classified as a priority group for vaccination [10], we propose to evaluate the vaccination coverage against COVID-19 among oral health care workers compared to other health care workers.

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MATERIALS AND METHODS

Type, place and period of the study

We conducted a cross-sectional analytical study over a three-month period from February 1 to April 30, 2022 in three public hospitals in the city of Yaoundé: the Yaoundé Central Hospital, the Yaoundé General Hospital, and the Yaoundé Gyneco-Obstetric and Pediatric Hospital. These study sites represent reference hospitals in the Cameroonian health system and are among those with the largest number of health care personnel in the city of Yaoundé. Their service offer is specialized because of the multitude of care units and services.

Study population

Our study population consisted of the medical and paramedical staff of the hospitals in our study. The following were considered to be oral practitioners: oral physicians, Ear-Nose-Throat (ENT) specialists, stomatology residents, ENT residents, technicians and nurses in the stomatology and ENT departments. All other health personnel were considered to be practitioners outside the oral sphere. Cameroonian staff who gave their consent was included in our study and those who voluntarily withdrew from the study or did not wish to provide certain information in the questionnaire were excluded. The sampling was non-probability consecutive and exhaustive.

Procedure

In each study site, the nursing staffs of all functional departments were approached. During an interview with them, we submitted a physical and self-administered research questionnaire after obtaining their informed consent. An online version was made available to facilitate the collection of information from the majority of the staff.

Study variables

The data collected were socio-demographic variables such as gender, age, marital status, religion, professional specialty, and years of experience, and vaccination-related variables such as vaccination status, type of vaccine received, number of doses received, post-vaccination adverse events, and post-vaccination SARS-CoV 2 infections.

Statistical analysis

Analysis and processing of the results were performed using the Statistical Package for Social Sciences (SPSS) software version 26.0. Qualitative variables were expressed as numbers and percentages and quantitative variables as mean and standard deviation or median and interquartile range according to the distribution of the data. The comparison between variables was done using the Chi-square or Fisher's exact test. Data were considered statistically significant for a p value<0.05.

Administrative and ethical considerations

Our study was approved by the ethics committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I. Administrative authorizations were obtained from the study sites. In the process of administering the questionnaire, the informed consent of the participants was obtained. Anonymity and strict respect of the fundamental principles of research were ensured.

RESULTS

During the study period, we recruited 377 health care workers, of whom 17 participants were excluded; this represents a participation rate of approximately 95%. A total of 360 questionnaires were analyzed.

General presentation of the study population

A predominance of women (222; 61.7%) and of the modal classes (30-40 years) in terms of age (136; 37.8%) and (1-10 years) in terms of years of professional experience (248; 68.9%) of participants was noted. A total of 60 (16.7%) oral health personnel and 300 (83.3%) non-oral health personnel were selected. Oral physicians, ENT and stomatology nurses, and otolaryngologists were the most common oral health care professionals: 23.3% (14/60), 21.7% (13/60), and 20.0% (12/60) respectively. As for the other practitioners, paramedical staff represented more than half (162/300; 54.0%) (Table 1).

Table 1: Distribution of sociodemographic characteristics in our study population.

Variable	Number	Percentage (%)
Gender (N=360)		
Male	138	38,3
Female	222	61,7
Age range (years) (N=360)		
[20-30]	103	28,6
[30-40]	136	37,8
[40-50]	88	24,4
[50-60]	33	9,2
Work expérience (years) (N=360)		
[1-10]	248	68,9
[10-20]	86	23,9
[20-30]	24	6,7
[30-40]	2	0,6
Area of expertise (N=360)		
Oral (n=60)	60	16,7
Non-oral (n=300)	300	83,3
Oral staff (N=60)		
Oral physician	14	23,3
Nurse	13	21,7
ENT specialist	12	20,0
ENT Resident	7	11,7
Stomatology resident	5	8,3
Dental technician	5	8,3
Maxillofacial surgeon	2	3,3
Orthodontist	1	1,7
Prosthodontist	1	1,7
Non-oral staff (N=300)		
Paramedical staff	162	54,0
Medical specialist	84	28,0
General practitioner	49	16,3
Pharmacist	5	1,67

COVID-19 vaccination rate and type of vaccine received

Approximately three out of ten (123/360; 34.2%) healthcare

workers had received at least one dose of a COVID-19 vaccine, for an overall vaccination rate of 34.2%. Of the 123 people vaccinated, 95% (117) had received all the required doses of vaccine, and more than half of those vaccinated had taken the Janssen vaccine (73; 59.3%). Area of expertise was not significantly associated with vaccination status (p=0.135) and did not influence the uptake of any vaccine type (p≥0.05) (Table 2).

Table 2: Distribution of vaccination status according to socio-professional groups in our study.

Variables	Vaccinated group		p
	Oral (%)	Non-oral (%)	
	N=60	N=360	
At least one dose of vaccine	26 (43,3)	97 (32,3)	0,135
	Oral (%)	Non-oral (%)	
	N=26	N=97	
Complete vaccination	24 (92,3)	93 (95,9)	0,606
Type of vaccine received			
BioNTech (Pfizer)	1 (3,8)	4 (4,2)	1,000
Janssen (Johnson &Johnson)	16 (61,5)	57 (58,8)	0,827
Oxford (Astra Zeneca)	3 (11,5)	11 (11,3)	1,000
Sinopharm BBIP	6 (23,1)	31 (32,0)	0,474

Post-vaccination adverse events for COVID 19

In the vaccinated study population, 53 (43.1%) staff reported the occurrence of adverse events. Among the vaccinated oral practitioners, 15 (57.7%) experienced adverse events compared to 38 (39.2%) non-oral practitioners (p=0.119). The most common post-vaccination adverse event was fever in both oral (9; 60%) and non-oral (14; 40%) practitioners. There was no difference between the two professional groups regarding the nature of the adverse events after vaccination (Table 3).

Table 3: Distribution of post-vaccination adverse events according to the socio-professional groups in our study.

Variables	Vaccinated group		p
	Oral (%) N=26	Non-oral (%) N=97	
Subjects who experienced adverse events	15 (57,7)	38 (39,2)	0,119
Undesirable effects	Oral (%) N=15	Non-oral (%) N=38	
Fever	9 (60,0)	14 (40,0)	0,228
Pain at the site of	3 (20,0)	9 (25,7)	1,000
Vaccination	1 (6,7)	10 (28,6)	0,131
Headache	2 (13,3)	1 (2,9)	0,211
Dizziness	6 (40,0)	7 (20,0)	0,170
Asthenia	0	3 (8,6)	0,545
Nausea	2 (13,3)	6 (17,1)	1,000
Courbatures	0	1 (2,9)	1,000

Post-vaccination COVID-19

Expertise did not influence the occurrence of a post-vaccination infection; approximately three out of ten people were infected with coronavirus after vaccination in both the oral group and the other group, with no significant difference (p=0.648) (Figure 1).

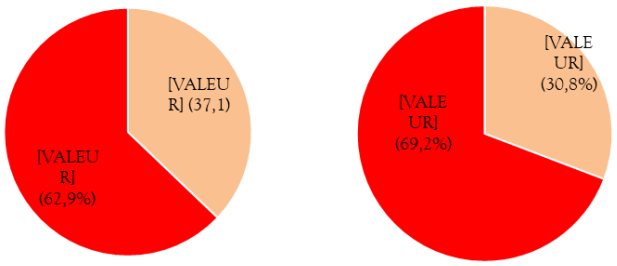

Figure 1: Distribution of post-vaccination infection rates by area of expertise in our study. **Note:** (■) Infected; (■) non infected

DISCUSSION

The objective of this study was to evaluate the COVID-19 vaccination coverage among oral health care workers in comparison with other health care workers in the city of Yaoundé. This was one of the first studies done on the vaccination status against COVID-19 among health personnel in Cameroon, and especially to highlight health professionals in the oral sphere. In our study, we found a predominance of women (61.7%) with a sex ratio of 0.61 in favor of women; this trend was similar to that of Doumou et al. in Cameroon in 2022, who found a predominance of women in a study of medical and paramedical personnel [7]; Fouogue et al. in Cameroon in 2020 also found a predominance of women in a study of health care personnel [11]. This trend could be explained by the predominance of women in the medical professions in Cameroon (55.74%) [12]. A mean age of 36.1 ± 8.52 years was found, with extremes of 20 and 57 years, which was similar to that reported by Fouogue et al. in Cameroon in 2020 who found a mean age of 35 ± 8.9 years [11]. This average can be justified by the recruitment in our study of residents and interns, who were young, newly graduated health personnel. The vaccination coverage rate was 34.2% with no significant difference between the two groups (p=0.135), similar to the results found by Agha et al. in 2021 in Nigeria [13] and Li et al. [14] in China in 2021 who reported respectively a vaccination coverage of 33% and 34.9% among health personnel. This still low percentage could be explained by the high proportion of medical staff in our study who thought that these vaccines would be harmful and ineffective. On the other hand, these results differed from those found by Hall et al. in 2021 in England [15], which were 89% of health workers vaccinated. This suggests that COVID-19 vaccination coverage rates among health care workers are variable and differ across geographic locations and settings. The more alarming mortality and morbidity rates in European countries and the implementation of vaccination passes could explain the greater mobilization for vaccination.

A complete vaccination rate of 95.1% (117/123) was found without significant difference between our groups. These results differed from those of Amani et al. in 2021 in Cameroon, who reported completion rates of less than 1.0% [8]. This difference may be due to the fact that the Amani et al. study [8] was conducted at a time when Cameroon was beginning its COVID-19 vaccination campaign, so participants were familiar with these vaccines and were not sufficiently informed about the importance of taking all the required doses of the vaccines [16]. The percentage of health care workers who experienced post-vaccination adverse events

was 57.7% among oral health care workers and 39.2% among non-oral health care workers. The main adverse events were fever (46%), pain at the vaccine injection site (24%), headache (22%) and asthenia (26%). This could be explained by the fact that the same post-vaccination adverse events are the most frequently described in the literature [17]. The refusal of many health care workers to participate in the study would have led not only to an underestimated sample size, but also to a lower vaccination coverage rate than that reported. Nevertheless, health workers who testified to having received a dose of the vaccines were not always in possession of their vaccination cards at the time we spoke with them, preventing us from objectifying their claims.

CONCLUSION

At the end of our study, it was found that vaccination coverage against COVID-19 was low. A similar distribution was found between oral health care workers and other health care workers in terms of vaccination rate, type of vaccine received and post-vaccination adverse events against SARS-CoV-2. Exposure of oral health care workers would not influence attitudes and outcomes related to SARS-CoV-2 vaccination. Targeted education could help promote vaccination among high-risk individuals and thus limit the spread of the virus in our Cameroonian context.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

CONTRIBUTION OF THE AUTHORS

Jacqueline Michèle Lowe, Marie Elvire Nokam and Joseph Kamgno designed the study. Esther Voundi Voundi and Elisabeth Songue collected the data. Eric Nseme, Esther Voundi Voundi and Elisabeth Songue performed the statistical analysis. Jacqueline Michèle Lowe, Eric Nseme, and Junior Voundi Voundi wrote the manuscript. Marie Elvire Noka and Joseph Kamgno critically reviewed the manuscript. All authors gave their approval for publication.

REFERENCES

1. Cascella M, Rajnik M, Aleem A, Dulebohn SC, di Napoli R. Features, evaluation, and treatment of coronavirus (COVID-19). Statpearls [internet]. 2022.
2. NCDC. COVID-19 Situation Report: Situation Report 95. Niger Cent Dis Control. 2021; 95:1–4.
3. Woo PC, Lau SK, Huang Y, Yuen KY. Coronavirus diversity, phylogeny and interspecies jumping. Exp Biol Med. 2009; 234(10):1117-1127.
4. Nguyen LH, Drew DA, Joshi AD, Guo CG, Ma W, Mehta RS, et al. Risk of COVID-19 among frontline healthcare workers and the general community: A prospective cohort study. medRxiv: the preprint server for health sciences. 2020.
5. WHO. COVID-19 : Occupational health and safety for health workers. COVID-19 Occup Heal Saf Heal Work. 2021:1–16.
6. Alsaegh A, Belova E, Vasil'ev Y, Zabroda N, Severova L, Timofeeva M, et al. COVID-19 in dental settings: Novel risk assessment approach. Int J Environ Res Public Health. 2021; 18(11):6093.
7. Mvomo NL, Voundi EV, Ngongang R, Blessing YS, Tassonwa HT, Etouckey EN, et al. Seroprevalence of anti-SARS-COV-2 antibodies in front-line medical and non-medical staff at the jordan medical services, cameroon: Descriptive cross-sectional study. Int. j. adv. res. 2022; 8(4):1-8.
8. Amani A, Njoh AA, Fouda AA, Ndoula S, Abba-Kabir HM, Mossus T, et al. The first 30 days of COVID-19 vaccination in Cameroon: Achievements, challenges, and lessons learned. Pan Afr Med J. 2022; 41.
9. World Health Organization. Monthly Bulletin-COVID-19 vaccination in the African Region.
10. WHO. Professionals H. COVID-19 Vaccine. 2022; 2–7.
11. Fouogue JT, Noubom M, Kenfack B, Dongmo NT, Tabeu M, Megozeu L, et al. Poor knowledge of COVID-19 and unfavourable perception of the response to the pandemic by healthcare workers at the Bafoussam Regional Hospital (West Region-Cameroon). Pan Afr Med J. 2020; 37(Suppl 1).
12. Tandi TE, Cho Y, Akam AJ, Afoh CO, Ryu SH, Choi MS, Kim K, Choi JW. Cameroon public health sector: shortage and inequalities in geographic distribution of health personnel. Int J Equity Health. 2015; 14(1):1-2.
13. Agha S, Chine A, Lalika M, Pandey S, Seth A, Wiyeh A, et al. Drivers of COVID-19 Vaccine Uptake amongst Healthcare Workers (HCWs) in Nigeria. Vaccines. 2021; 9(10):1162.
14. Li XH, Chen L, Pan QN, Liu J, Zhang X, Yi JJ, et al. Vaccination status, acceptance, and knowledge toward a COVID-19 vaccine among healthcare workers: a cross-sectional survey in China. Hum Vaccin Immunother. 2021; 17(11):4065-4073.
15. Hall VJ, Foulkes S, Saei A, Andrews N, Oguti B, Charlett A, et al. COVID-19 vaccine coverage in health-care workers in England and effectiveness of BNT162b2 mRNA vaccine against infection (SIREN): a prospective, multicentre, cohort study. Lancet. 2021; 397(10286):1725-1735.
16. Riad A, Pokorná A, Attia S, Klugarová J, Koščík M, Klugar M. Prevalence of COVID-19 vaccine side effects among healthcare workers in the Czech Republic. J Clin Med. 2021; 10(7):1428.
17. Koh SW, Liow Y, Loh VW, Liew SJ, Chan YH, Young D. COVID-19 vaccine acceptance and hesitancy among primary healthcare workers in Singapore. BMC Prim Care. 2022; 23(1):1-9.