

# Self-Reported Oral Manifestations of Covid-19 Amongst Health Workers of the University College Hospital Ibadan, Nigeria

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**Abstract:** *COVID-19 was a global pandemic that imposed an unprecedented health burden on the public and members of the health workers. As a result, the study on self-reported oral manifestations of COVID-19 among health workers of the University College Hospital, Ibadan, Nigeria was carried out. One hundred and fifty health workers of different departments of the clinical section of the hospital were selected through a convenience sampling technique. The results revealed that the majority of the respondents were male (54.0%) with mean age 35.17 years. 51.3% of the respondents indicated that they have had a COVID-19 test done, while a negligible percentage (10.7%) tested positive to COVID -19. Among the respondents, 24.7% and 21.3% experienced change in smell and taste respectively. The study concluded that alterations in taste and smell were the most commonly reported oral symptoms and recommended prompt accessible COVID-19 testing for individuals presenting with suggestive oral symptoms, particularly changes in taste and smell.*

**Keywords:** COVID -19, healthworkers, pandemic, oral symptoms, smell and taste.

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## INTRODUCTION

Coronavirus disease 2019 (COVID-19) was officially declared a global pandemic by the World Health Organization (WHO) on 11 March 2020, following its initial identification in Wuhan, China, and first reported to the WHO on 31st December, 2019 (World Health Organisation[WHO]). Since its emergence, COVID-19 has imposed an unprecedented global public health burden, affecting all spheres of life worldwide. As of early 2021, over 112 million cases and more than 2.4 million deaths had been reported globally, underscoring the overwhelming impact of the disease.

COVID-19 is caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), a single-stranded RNA virus with a high transmission rate. Transmission occurs primarily through

respiratory droplets and contact routes and may involve symptomatic as well as asymptomatic individuals. In response to the rapid spread of the virus, preventive measures such as regular hand hygiene, use of alcohol-based sanitizers, wearing of face masks, and physical distancing were widely implemented (Lofti et al., 2020). In addition, several vaccines, including Pfizer-BioNTech, Oxford/AstraZeneca, and Sputnik V, were developed to mitigate disease severity and transmission. According to the WHO, the most common symptoms of COVID-19 include fever, dry cough, and fatigue. Other symptoms include loss of taste, loss of smell, nasal congestion, conjunctivitis, sore throat, headache, muscle or joint pain, skin rashes, nausea, vomiting, diarrhoea, chills, and dizziness. Severe disease is associated with symptoms such as shortness of breath, chest pain or pressure, confusion, loss of appetite, and persistent high fever. While most individuals recover without hospitalization, approximately 15% develop severe disease requiring intensive care, particularly those with comorbidities such as hypertension, diabetes mellitus, cancer, and other chronic conditions (Wu & Mc Googan 2020). Furthermore, some individuals experience long-term sequelae, including fatigue, neurological symptoms, and respiratory complications beyond the acute phase of infection (Rahmati et al, 2025).

Although COVID-19 is primarily recognized as a respiratory illness, increasing evidence suggests that the oral cavity is also involved. Loss of taste is one of the most frequently reported oral manifestations of COVID-19 (Biadsee et al, 2020). Other reported oral symptoms include dry mouth (xerostomia), oral ulcers, and difficulty swallowing (Chen et al, 2020). Despite these reports, the oral cavity is often not routinely examined in COVID-19 patients, and the true prevalence of oral manifestations remains unclear.

The oral cavity plays a critical role in reflecting systemic health, as many systemic diseases present with early and sometimes distinctive oral manifestations (Napenas et al, 2020). These manifestations can aid in early diagnosis and prompt management, thereby improving patient outcomes. Consequently, adequate knowledge and awareness of oral manifestations of systemic diseases among healthcare workers are essential. This is particularly relevant in the context of COVID-19, where early recognition of symptoms—including oral symptoms—may facilitate timely identification and isolation of cases.

The involvement of the oral cavity in COVID-19 infection is biologically plausible. Angiotensin-converting enzyme-2 (ACE-2), a key receptor facilitating SARS-CoV-2 entry into host cells, is expressed in several tissues, including the oral mucosa and salivary glands. Studies have demonstrated the presence of ACE-2 receptors in the salivary glands, and SARS-CoV-2 has been isolated from saliva of COVID-19-positive individuals (Matuck et al, 2021). This suggests that the salivary glands may serve as a reservoir for the virus, potentially explaining oral symptoms such as xerostomia and taste impairment.

Given the wide clinical spectrum of COVID-19 and the growing recognition of oral manifestations as potential early indicators of infection, it is imperative that healthcare workers possess adequate

knowledge of these features. Awareness of oral symptoms may enhance early detection, prompt testing, and appropriate management of suspected cases.

A review of existing literature reveals a paucity of studies examining both the knowledge of oral manifestations of COVID-19 and the prevalence of self-reported oral symptoms among clinical healthcare workers. This represents an important research gap, particularly in the Nigerian context. Therefore, assessing the knowledge and prevalence of self-reported oral manifestations of COVID-19 among clinical healthcare workers at the University College Hospital (UCH), Ibadan is of significant research and public health importance.

### **Study objectives**

The general objective was to determine the knowledge and prevalence of self-reported oral manifestations of COVID-19 amongst clinical health care workers of the University College Hospital, Ibadan. Specifically, the study sought to:

- determine the age and income of respondents.
- assess the knowledge of oral manifestations of COVID-19 infection among the respondents.
- determine prevalence of self-reported oral symptoms of COVID-19 that occurred during the COVID-19 pandemic among the respondents, regardless of their COVID-19 status.
- determine the socio-economic factors associated with the knowledge of oral symptoms of COVID-19 among the respondents.

### **METHODOLOGY**

The study was carried out among clinical health workers in various departments at the University College Hospital, Ibadan. The departments include Nursing, Physiotherapy, Dentistry and Medicine. The study made use of a descriptive cross-sectional approach to assess the knowledge and prevalence of oral effects of COVID-19 among workers of the Hospital. University College Hospital (UCH) is a tertiary teaching hospital that was officially opened to the public on 20<sup>th</sup> November 1957. This institution offers healthcare services to the public. Currently, the hospital has about 850 bed spaces available to the public. It is located in the largest city in West Africa.

#### **Data collection**

The convenience sampling technique was used in selecting respondents from different clinical departments of the hospital ; 40 from Nursing, 13 from Physiotherapy, 51 from Dental while 46 were selected from Medical departments making a total of 150 respondents used in the study. Following a written informed consent, self-administered questionnaires were used to assess the knowledge of workers on oral manifestations of COVID-19. The questionnaire comprised four sections: Section A was about socio-demographic factors, including age, gender, marital status, tribe; Section B related to knowledge of possible oral manifestations associated with COVID-19; Section C investigated the prevalence of self-reported oral symptoms associated with COVID-19

infection respondents suffered from during the pandemic, irrespective of their COVID-19 status; and Section D determined respondents who had tested positive for COVID-19 infection. The data was collected through Google form online surveys.

### **Data analysis**

The collected data was coded and entered into a password-protected personal computer and the analysis was done using the Statistical Package for Social Sciences (SPSS Inc. Chicago) Version 23. Frequency distributions of variables such as age, gender, departments and income were generated. Categorical data was analysed using the Chi-Square test, factors associated were analysed using the logistics regression analysis. Data was presented using summary statistics such as frequency tables, charts, means and standard deviation. The variables were cross tabulated with the respondents' mean age, gender, departments. The level of statistical significance was set at  $p < 0.05$ .

### **Ethical considerations**

Ethical approval for the study was obtained from the Joint University of Ibadan/University College Hospital Ethics Review Committee.

## **RESULTS AND DISCUSSION**

### **Socio-economic characteristics of health workers**

The respondents' socio-economic characteristics are presented in Table 1. The age of the health worker ranged from 21 to 66 years, while the mean age was  $35.17 \pm 10.43$  years. This implies the population of the study was generally young, and are expected to be professionally productive and economically active. They are likely to have been exposed to COVID-19 in the course of delivering health care services to patients during the pandemic. According to the data on gender, 81 (54%) of the respondents were male while only 69 (46%) were female. From this finding, it can be inferred that there are more male health workers in the clinical unit of the hospital. As regards income, most (55.3%) of them earned over ₦200,000 monthly, with just 12.0% earning below ₦100,000, indicating a fairly moderate level of income among the health workers. With respect to departmental affiliation, most of them were attached to the Dental (33.6%) and Medical (30.3%), while Physiotherapy (8.6%) recorded the least number of health workers. The implication of dental and medical health workers dominating the study population is that they possess a likelihood to have greater knowledge of oral health and may show more accuracy in the identification and reporting of oral manifestations connected to COVID-19.

**Table 1: Socio-economic characteristics of respondents (N = 150)**

| Variable                  | Category           | Frequency(n) | Percentage /Mean (%) |
|---------------------------|--------------------|--------------|----------------------|
| <b>Age Range</b>          | 21.00 - 66.00      | -            | 35.17 ± 10.43        |
| <b>Sex</b>                | Male               | 81           | 54                   |
|                           | Female             | 69           | 46                   |
| <b>Monthly income (₹)</b> | <100,000           | 19           | 12                   |
|                           | 100,000 - 150,000  | 27           | 18                   |
|                           | 150,000 - 2000,000 | 21           | 1                    |
|                           | >200,000           | 83           | 55.3                 |
| <b>Department</b>         | Medical            | 46           | 30.3                 |
|                           | Dental             | 51           | 33.6                 |
|                           | Nursing            | 40           | 26.3                 |
|                           | Physiotherapy      | 13           | 8.6                  |

SD = Standard deviation

### Knowledge of oral symptoms of COVID-19

Health care workers' knowledge of oral symptoms of COVID-19 by department is depicted in Table 2. Findings revealed a generally high level of knowledge among the healthcare workers, consistent with hypothesis 1. The majority (70%) of respondents agreed that a COVID-19 infected individual may show oral symptoms. This shows a high level of enlightenment about the condition of the oral cavity of COVID-19 positive individuals.

Bhagavathula et al. (2020) discovered that knowledge of COVID-19 among healthcare workers varied across professional groups. This aligns with this study, in that the departments of respondents were equally associated with their knowledge of oral symptoms of COVID-19. Knowledge level was highest amongst Dentists, followed closely by Medical respondents (22.7%), while it was lowest amongst Physiotherapists (2.7%). These findings are expected, as dentists are more directly involved in oral health care and as a result more familiar with the various oral manifestations that can occur in COVID-19 infected patients. In a similar vein, the clinical training and exposure of medical healthcare workers account for the high knowledge they possess relating to emerging disease symptoms. Overall, oral manifestations are very significant signs and pointers to systemic diseases (M. Vishal et al., 2010) such as Covid-19.

The Chi-square test gave a statistically significant association between the departments of the respondents and their knowledge of oral manifestations of COVID-19 symptoms ( $\chi^2 = 0.003$ ). It signifies that the specialization of health care workers has a bearing on their level of awareness and understanding oral health disease symptoms.

**Table 2: Knowledge of oral symptoms of COVID-19 by department (N = 150)**

| Department    | Agree | Don't Know | Disagree | Total |
|---------------|-------|------------|----------|-------|
| Medical       | 34    | 10         | 2        | 46    |
| Dental        | 42    | 6          | 3        | 51    |
| Nursing       | 25    | 9          | 6        | 40    |
| Physiotherapy | 4     | 8          | 1        | 13    |
| Total         | 105   | 33         | 12       | 150   |

Pearson  $\chi^2 = 0.003$ **Testing positive to COVID-19.**

As shown in Table 3 just a little above half (51.3%) of the healthcare workers indicated that they have had a COVID-19 test done. Out of the figure of those who had done a test, only a small proportion (10.7%) tested positive. This implies a low confirmed rate of infection among the study participants, though the significant part of those who never had a test (38.0%) may not actually give a true reflection of the prevalence of infection. Findings across departments further revealed that among those who tested positive for the disease, medical healthcare workers had the highest number (4.7%). The higher number of infections among medical healthcare workers during the pandemic could be traced to their increased exposure to patients. The relationship between healthcare workers' department and their COVID-19 test status was not significant ( $\chi^2 = 0.284$ ), signifying that the department to which healthcare workers belong does not determine their COVID-19 test status.

**Table 3: COVID-19 test status by department (N = 150)**

| Department    | Yes | No | Never tested | Total |
|---------------|-----|----|--------------|-------|
| Medical       | 7   | 27 | 12           | 46    |
| Dental        | 5   | 23 | 23           | 51    |
| Nursing       | 4   | 18 | 18           | 40    |
| Physiotherapy | 0   | 9  | 4            | 13    |
| Total         | 16  | 77 | 57           | 150   |

Pearson  $\chi^2 = 0.284$ **Self-reported change in sense of smell and taste during COVID-19**

According to Tables 4,5,6 and 7; almost one-quarter (24.7%) of the respondents experienced changes in their sense of smell. Equally, across gender and marital status categories, more males (15.3%) and married (14.7%) respondents experienced change in sense of smell. This observation aligns with evidence that a major symptom of COVID-19 disease is loss of sense of smell and the only symptom in some instances (Borsetto et al., 2020). With respect to taste, 21.3% experienced alterations in taste. Interestingly, out of these figures, healthcare workers from the nursing department formed the greatest proportions of those who observed changes in sense of smell (12.0%) and taste (10.0%). A possible justification for this is that nurses are usually closer and have prolonged contacts with patients, thereby increasing their level of exposure and chance of experiencing symptoms associated with COVID-19. Proof abound that an early or even sole

symptom of Covid-19 is loss or alteration of smell and taste among patients (Hopkins and Kelly, 2021; Lechien et al., 2020). A significant relationship was observed between healthcare workers' departments and their experience of changes in sense of smell ( $\chi^2 = 0.004$ ) and taste ( $\chi^2 = 16.716$ ) during COVID-19. This points to the significance of department or professional roles and exposure level of healthcare workers could determine whether they would experience or notice any alterations in change of smell and taste as a result of the disease.

**Table 4: Self-reported change in sense of smell during COVID-19 by department (N = 150)**

| Department    | Yes | No  | Total |
|---------------|-----|-----|-------|
| Medical       | 6   | 40  | 46    |
| Dental        | 11  | 40  | 51    |
| Nursing       | 18  | 22  | 40    |
| Physiotherapy | 2   | 11  | 13    |
| Total         | 37  | 113 | 150   |

Pearson  $\chi^2 = 0.004$

**Table 5: Self-reported taste alteration during COVID-19 by department (N = 150)**

| Department    | Yes | No  | Total |
|---------------|-----|-----|-------|
| Medical       | 2   | 44  | 46    |
| Dental        | 14  | 37  | 51    |
| Nursing       | 15  | 25  | 40    |
| Physiotherapy | 1   | 12  | 13    |
| Total         | 32  | 118 | 150   |

Pearson  $\chi^2 = 16.716$ , df = 3, p = 0.001; Likelihood Ratio = 19.128, Linear-by-Linear Association = 5.039

**Table 6: Change in sense of smell by gender (N = 150)**

| Gender | Yes | No  | Total |
|--------|-----|-----|-------|
| Male   | 23  | 58  | 81    |
| Female | 14  | 55  | 69    |
| Total  | 37  | 113 | 150   |

Pearson  $\chi^2 = 0.251$

**Table 7: Change in sense of smell by marital status (N = 150)**

| Marital Status | Yes | No  | Total |
|----------------|-----|-----|-------|
| Single         | 13  | 48  | 61    |
| Married        | 22  | 63  | 85    |
| Divorced       | 2   | 2   | 4     |
| Total          | 37  | 113 | 150   |

Pearson  $\chi^2 = 0.403$

## CONCLUSION AND RECOMMENDATIONS

This study demonstrates a high level of awareness of the oral manifestations of COVID-19 among clinical healthcare workers at the University College Hospital, Ibadan. Alterations in taste and smell were the most commonly reported oral symptoms, highlighting their relevance as potential early indicators of COVID-19 infection. The occurrence of self-reported oral symptoms among healthcare workers during the pandemic, irrespective of confirmed COVID-19 status, underscores the importance of oral manifestations in the clinical spectrum of the disease. Given the increased occupational exposure of healthcare workers, adequate knowledge of these manifestations is necessary for early suspicion, timely testing, and appropriate referral.

Regular and structured educational interventions, including seminars, webinars, and continuing professional development programs, should be implemented to further strengthen healthcare workers' knowledge of the oral manifestations of COVID-19. Prompt and accessible COVID-19 testing is recommended for individuals presenting with suggestive oral symptoms, particularly changes in taste and smell. Further, multicenter studies are encouraged to assess knowledge and prevalence of oral manifestations of COVID-19 among healthcare workers in different settings. Additionally, research targeting the general population is recommended to guide public health education and improve early recognition of COVID-19-related oral symptoms.

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