

# Exploring the Awareness and Use of Teledentistry Among Dental Professionals in A Nigerian University Teaching Hospital; A Cross-Sectional Survey

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## ABSTRACT

**Background:** Teledentistry is an emerging practice with the potential to significantly impact both the evolving landscape of dental clinical practice and public health delivery. This practice typically includes various components and activities such as the use of electronic data and audiovisual communication technologies in diagnosis and delivery of oral health care, enabling dental care delivery across geographical distances, especially in rural and remote areas. The objective of this study was to evaluate the level of awareness and use of teledentistry in oral health care delivery among dental professionals at Obafemi Awolowo University Teaching Hospitals' Complex (OAUTHC), Ile-Ife, Osun State, Nigeria.

**Methods:** A structured self-administered questionnaire designed with a four-point Likert scale was administered to all dental healthcare professionals in the hospital. The questionnaire contained relevant sections designed to elicit unbiased and honest responses regarding demographics, level of awareness and use of teledentistry, knowledge of teledentistry, perceptions on potential uses, ethical considerations, and possible barriers to implementation.

**Results:** All selected professionals in the hospital (100%) completed the questionnaire. Respondents included 65 males and 36 females, aged 20-70 years, with Resident Doctors (44.6%) aged 30-40 years being the largest group. The level of awareness and use of teledentistry among dental professionals was 49.9% and 4.1% respectively. 51.1% of respondents had no prior knowledge of teledentistry in oral health care delivery. Resident doctors appeared to be the most informed category while dental therapists were the least informed.

**Conclusion:** The overall level of awareness of teledentistry among dental healthcare professionals at OAUTHC was moderate. It is important to stimulate and encourage the optimal application of teledentistry in the studied population to ensure improvements in oral health care delivery for both practitioners and numerous trainees passing through the teaching hospital.

**Keywords:** Teledentistry, Awareness, Perception, Dental professionals

## INTRODUCTION

Teledentistry is an emerging best practice with significant potential to impact both dental clinical practice and public health delivery.<sup>1</sup> This practice typically includes various components such as the use of electronic data and audiovisual communication technologies in delivering oral health care and managing dental problems across geographical distances, particularly in rural and remote areas.<sup>2</sup> The first practical application of teledentistry can be traced to a 1994 United States project aimed at assessing the dental health of Army servicemen.<sup>3</sup> In 1997, Cook introduced the term "Teledentistry" as the practice of using video-conferencing technologies to diagnose and provide treatment advice over distance.<sup>4</sup> Teledentistry

integrates consultation, continuing education, community awareness, diagnosis, and treatment planning outside traditional dental office settings using computers, cameras, printers, and internet technologies.<sup>5</sup> Generally, it encompasses two techniques: real-time consultation and store-and-forward methods.<sup>6</sup> Real-time consultation involves video conferencing where dentists and patients communicate via high-bandwidth network connections. The store-and-forward technique involves the exchange of clinical knowledge and images stored within telecommunication devices.<sup>6</sup>

Bradley and colleagues in 2010 demonstrated the effective use of teledentistry in oral medicine through a community dental service in Belfast, Northern Ireland, using a prototype teledentistry system.<sup>7</sup> A 2008 recommendation supported distant diagnosis as

an effective alternative for diagnosing oral lesions using digital image transmission via email.<sup>8</sup> Additionally, Northern Arizona University Dental Hygiene Department developed a teledentistry-assisted affiliated practice and dental hygiene model.<sup>9</sup> According to recent statistics, Nigeria's rural population was estimated at 46.48% of the total population in 2022, with the remainder comprising urban populations.<sup>10</sup> With an estimated population of 237.5 million, each Nigerian dentist is expected to care for approximately 54,000 Nigerians<sup>10</sup>. Furthermore, the number of Nigerians residing in areas distant from dental facilities continues to grow daily,<sup>11</sup> with a vast majority living with untreated oral diseases.<sup>12</sup> Consequently, Nigerians in rural or underserved areas are among those most in need of oral health care in their communities.<sup>13</sup>

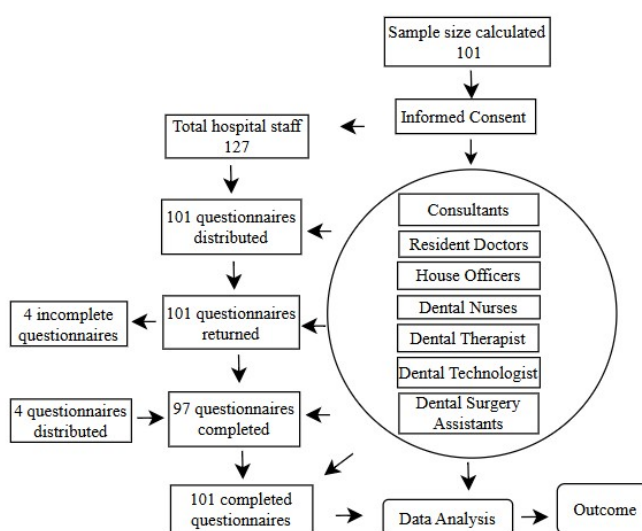
Teledentistry can provide dental care to patients in rural areas at reasonable cost and convenience, reducing the necessity for travel (on poorly maintained roads with high fuel expenses) and ensuring appropriate referral guidance.<sup>14</sup> Teledentistry has gained increasing recognition over the last decade as a promising solution for easy, fast, and safe delivery and distribution of health information.<sup>15</sup> It provides an effective means for augmenting care and reducing clinic visit times without compromising essential check-ups.<sup>16,17</sup> Effective implementation of teledentistry requires collaboration among various professionals with expertise in dentistry,<sup>18</sup> technology and IT specialists (telecommunications experts and software developers),<sup>19</sup> healthcare administrators and managers, health IT managers, legal and regulatory experts, educators and trainers, insurance and reimbursement specialists, patient engagement specialists, public health professionals, telehealth consultants, and research and development teams.<sup>20</sup> Consequently, awareness and understanding of teledentistry is of utmost importance among dental professionals for its successful implementation in oral health care.

This study aims to assess the level of awareness, acceptance, and practice of teledentistry among dental professionals in oral health care service delivery at Obafemi Awolowo University Teaching Hospital, the foremost tertiary hospital in Osun State, Nigeria. To the best of our knowledge, no center in Nigeria or elsewhere in Africa has formally adopted teledentistry. Nevertheless, teledentistry remains a valuable tool during epidemiological outbreaks such as COVID-19 lockdowns, when access to routine dental care was restricted. In such circumstances, teledentistry provides an avenue to ensure continuity of care, delivery of emergency services, and reduction of risks associated with in-person consultations. From a policy perspective, integrating

teledentistry into national digital health frameworks could strengthen the resilience of oral health services during future public health crises while eliminating longstanding barriers to access in rural and underserved communities.

## METHODS

This research was conducted at the Dental Centre of OAUTHC, Ile-Ife among consented dental professionals including consultants, registrars, house officers, dental technologists, dental therapist, dental nurses, and dental surgery assistants between June and July 2024. Sample size calculation was performed, and respondents were recruited through individual contact. A cross-sectional survey design was adopted using a self-administered questionnaire that assessed the level of awareness and use of teledentistry among respondents. The study followed the principles of the Declaration of Helsinki and was reported in accordance with STROBE guidelines. A preliminary pilot study was conducted to ensure the validity and reliability of the study instrument. Cronbach's alpha was calculated for items measuring awareness, acceptance, and practice of teledentistry using IBM SPSS Statistics (Version 28.0). The overall coefficient was 0.82, indicating good reliability ( $\geq 0.70$  acceptable). Questionnaire validity was further established through expert opinions from subject specialists. The study instrument was subsequently adjusted and distributed to consenting dental professionals. The questionnaire included sections on respondents' demographic data, knowledge of teledentistry, perceived usefulness for patients, application in dental practice, potential for improving oral health care practices, and challenges associated with teledentistry implementation.



STROBE diagram or Study flow chart

All study participants were adequately informed about the research purpose and objectives, and verbal informed consent was obtained. The study received ethical approval from the Health Research Ethics Committee of Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria (ethical clearance certificate number: IRH/OAU/12/2431). Questionnaires were collected immediately after completion. Data obtained from the survey were analyzed using IBM SPSS version 28.0. Results are presented as frequencies, percentages, and mean values in tables. Chi-square tests were performed where appropriate, with statistical significance set at  $p < 0.05$ . All results are reported with 95% confidence intervals (95% CI).

## RESULTS

A total of 101 dental professionals participated in this study, comprising 36 (35.6%) females and 65 (64.4%) males. The sample included 20 (19.8%) consultants, 45 (44.6%) resident doctors, 10 (9.9%) house officers, 14 (13.9%) dental nurses, 3 (2.9%) dental therapists, 6 (5.9%) dental technologists, and 3 (2.9%) dental surgery assistants. The majority of respondents (41.6%) were within the age range of 31-40 years. Resident doctors constituted the largest professional group (44.6%), followed by consultants (19.8%), while dental therapists and dental surgery assistants represented the smallest groups (2.9% each) (Figure 1).

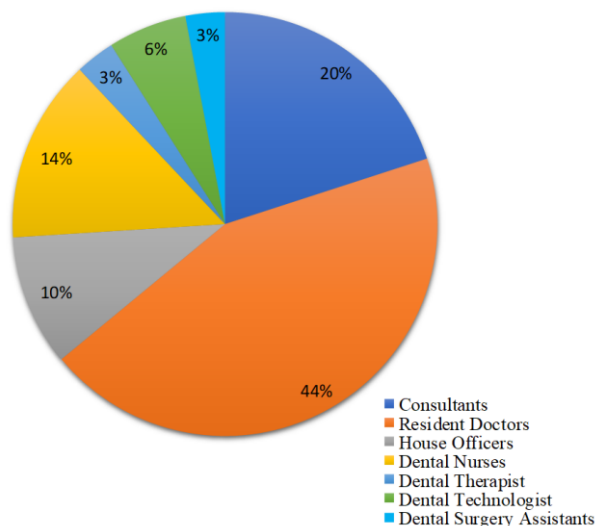


Fig 1. Pie chart showing the percentage of distribution of respondents.

### Level of Awareness of Teledentistry

Using eight standardized prompts (Table 1), we assessed respondents' awareness and utilization of teledentistry in oral healthcare delivery. The overall awareness level was 49.9%, while 51.1% of respondents reported no prior knowledge of

teledentistry applications in oral healthcare. Awareness and usage rates were highest among consultants and resident doctors, and lowest among dental therapists and dental surgery assistants.

### Perception of Teledentistry Among Respondents

Through 17 standardized prompts, we evaluated respondents' perceptions of teledentistry. Eleven prompts addressed fundamentally true statements about teledentistry, while six statements allowed for individual interpretation. Regarding the factual statements, consultants' and resident doctors' opinions generally aligned with other groups. However, when comparing agreement levels, significantly more consultants and resident doctors strongly agreed that teledentistry provides a valuable platform for expert consultation ( $p=0.04$ ). Similarly, while overall opinions did not differ significantly across groups, substantially more consultants and resident doctors believed teledentistry would be well-received upon implementation ( $p=0.02$ ) (Table 2).

### Assessment of Teledentistry Device and Platform Utilization

We conducted a three-level assessment of teledentistry device and platform usage among respondents. Only 25.1% reported prior use of teledentistry platforms for consultation purposes. Mobile devices (video and audio consultations) were the most commonly used platforms among dental professionals at OAUTHC (Table 3). Notably, dental nurses, therapists, technicians, and dental surgery assistants reported no exposure to teledentistry platforms. Familiarity with five specific teledentistry platforms was examined, with thirteen respondents (all dentists) reporting familiarity with common platforms. The websites [www.dentu.com](http://www.dentu.com) and [www.doxy.me](http://www.doxy.me) were the most widely recognized platforms (Table 3).

**Table 1: The Respondents' level of awareness of about teledentistry.**

CADRE	Consultant N=20 n (%)	Resident N=45 n (%)	House Officer N=10 n (%)	Dental Nurse N= 14 n (%)	Dental Therapist N=3 n (%)	Dental Techn. N=6 n (%)	Dental Surgery Asst. N = 3 n (%)	Total N = 101 n (%)
1 Prior involvement in the evaluation of patients using computers, computer applications and software	14(70.0)	25(55.6)	6(60.0)	6(42.9)	1(33.3)	3(50.0)	1(33.3)	56(55.5)
2 Prior involvement in the monitoring of patients using computer applications and software	9(45.0)	23(51.1)	2(20.0)	2(14.3)	1(33.3)	0(0.0)	1(33.3)	38(37.6)
3 Prior involvement in the use of digital diagnostic devices and software for analysis.	13(65.0)	22(48.9)	2(20.0)	6(42.9)	1(33.3)	2(33.3)	1(33.3)	47(46.5)
4 Prior involvement in the use of digital diagnostic devices and software for follow-up	7(35.0)	19(42.2)	3(30.0)	5(35.7)	1(33.3)	1(16.7)	1(33.3)	37(36.6)
5 Awareness on the use of digital devices and software to check, analyze and follow up patients, improve oral health services	14(70.0)	36(80.0)	8(80.0)	10(71.4)	2(66.7)	2(33.3)	2(66.7)	74(73.3)
6 Awareness about use of Teledentistry for emergency dental issues	16(80.0)	32(71.1)	5(50.0)	8(57.1)	1(33.3)	5(83.3)	1(33.3)	68(67.3)
7 Awareness about use of Teledentistry for minor or extensive dental surgical procedure	10(50.0)	15(33.3)	4(40.0)	7(50.0)	1(33.3)	5(83.3)	2(66.7)	44(43.6)
8 Engagement in collaborative consultation of patients with the other dental professionals located in other parts of the world	12(60.0)	20(44.4)	2(20.0)	3(21.4)	1(33.3)	1(16.7)	0(0.0)	39(38.6)
<b>OVERALL AVERAGE No (%)</b>	11.9(59.4)	24(53.3)	4(40.0)	5.9(41.9)	1.1(37.5)	2.4(39.6)	1.1(37.5)	50.4(49.9)

**Table 2: Perception of teledentistry among the respondents**

S/N	Tele dentistry,	Consultants and Resident Doctors (N=65)					Others (N= 36.)					P value A&SA / All
		SD No (%)	D No (%)	NA/D No (%)	A No (%)	SA No (%)	SD No (%)	D No (%)	NA/D No (%)	A No (%)	SA No (%)	
1.	is the practice and use of computers, the internet, and audio- visual devices for treatment over a distance	1(1.5)	1(1.5)	5(7.7)	27(41.5)	31(47.7)	1(2.9)	3(8.6)	3(8.6)	14(40.0)	14(40.0)	0.76/0.50
2.	can encourage appropriate guidelines, advice, and preventive dental measures in oral health care services	1(1.5)	1(1.5)	3(4.6)	29(44.6)	31(47.7)	0(0.0)	2(5.6)	2(5.6)	20(55.6)	12(33.3)	0.19/0.47
3.	lessens costs for dental treatment, consultation, and travel	3(4.6)	4(6.2)	10(15.4)	26(40)	22(33.8)	2(5.6)	5(13.9)	5(13.9)	12(33.3)	12(33.3)	0.73/0.75
4.	would be useful in society if introduced	1(1.5)	1(1.5)	1(1.5)	36(55.4)	26(40.0)	0(0.0)	1(2.8)	3(8.3)	19(52.8)	13(36.1)	0.90/0.49
5.	reduces waste of time compared to a physical appointment	1(1.5)	4(6.2)	8(12.3)	31(47.7)	21(32.3)	1(2.8)	3(8.3)	7(19.4)	14(38.9)	11(30.6)	0.091 /0.82
6.	encourages effective communication with patients	2(3.3)	1(1.6)	11(18.0)	32(52.5)	15(24.6)	0(0.0)	1(3.0)	5(15.2)	19(57.6)	8(24.2)	0.84/0.92
7.	could be useful in monitoring and evaluating patient	1(1.5)	1(1.5)	4(6.2)	34(52.3)	25(38.5)	1(2.8)	1(2.8)	2(5.6)	22(61.1)	10(27.8)	0.298/0.83
8.	could enhance access to oral health care in remote areas and underserved population	1(1.5)	3(4.6)	7(10.8)	32(49.2)	22(33.8)	1(2.8)	5(13.9)	5(13.9)	18(50.0)	7(19.4)	0.275/0.34
9.	would be helpful for patient education	1(1.5)	2(3.1)	1(1.5)	34(52.3)	27(41.5)	0(0.0)	1(2.8)	5(13.9)	21(58.3)	9(25.0)	0.19/0.08
10	provides a platform of expert consultation	2(3.1)	6(9.2)	6(9.2)	35(53.8)	16(24.6)	0(0.0)	4(11.1)	4(11.1)	25(69.4)	3(8.3)	<b>0.04/0.24</b>
11	is a time saving technique	5(7.7)	0(0.0)	5(7.7)	32(49.2)	23(35.4)	0(0.0)	2(5.6)	4(11.1)	21(58.3)	9(25.0)	0.28/0.098
12.	it offers accurate diagnosis	4(6.2)	8(12.3)	22(33.8)	27(41.5)	4(6.2)	2(5.6)	4(11.1)	6(16.7)	19(52.8)	5(13.9)	0.43 /0.32
13.	it would be well received if introduced	2(4.0)	1(2.0)	8(16.0)	27(54.0)	12(24.0)	0(0.0)	1(2.8)	7(19.4)	26(72.2)	2(5.6)	<b>0.02 / 0.13</b>
14.	I am worried about data entry mistakes	8(12.3)	15(23.1)	21(32.3)	16(24.6)	5(7.7)	2(6.4)	5(16.1)	6(19.4)	16(51.6)	2(6.5)	0.34/0.15
15.	I think teledentistry can violate patients' privacy	5(7.7)	23(35.4)	16(24.6)	19(29.2)	2(3.1)	7(19.4)	10(27.8)	11(30.6)	6(16.7)	2(5.6)	0.28/0.26
16.	I cannot trust the equipment used in teledentistry	8(12.3)	26(40.0)	17(26.2)	12(0.2)	2(3.1)	4(11.1)	13(36.1)	9(25.0)	10(27.8)	0(0.0)	0.21/0.71
17.	it is applicable to every branch of dentistry	5(7.7)	7(10.8)	17(26.2)	24(36.9)	12(0.2)	3(8.3)	5(13.9)	6(16.7)	18(50.0)	4(11.1)	0.21/0.58

KEY : SD; strongly disagree, D: disagree, NA/D; Neither agree / disagree, A: agree, SA; strongly agree  
 Items 1-11 Essentially true statements; Items 12-17 largely subject to individual opinion



**Table 3: Assessment of the use of teledentistry devices and common platforms by the respondents**

CADRES									
VARIABLES	Consultants N=20 n (%)	Residents N=45 n (%)	House Officers N=10 n (%)	Dental Nurses N= 14 n (%)	Dental Therapist N=3 n (%)	Dental Techn. N=6 n (%)	Dental Surgery Asst. N = 3 n (%)	Total N=101 n (%)	
1. Prior use of teledentistry platform(s) for consultation.	9(45.0)	12(26.7)	3(30.0)	2(14.3)	0(0.0)	0(0.0)	0(0.0)	26(25.7)	
2. Names of devices and platforms used by dental professionals in OAUTHC for consultations.									
A CAD/CAM, Digital radiograph	1(5.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(1.0)	
B Carbon health	0(0.0)	1(2.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(1.0)	
C digital imaging review	0(0.0)	1(2.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(1.0)	
D Digital X-ray	1(5.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(1.0)	
E Mobile device (Video and audio consultations	2(10.0)	3(6.7)	1(10.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(5.9)	
F Rem consult, digital imaging review, appoint & rev	1(5.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(1.0)	
3. Prior familiarity with common teledentistry platforms.									
A <a href="http://www.dentulu.com">www.dentulu.com</a>	1(5.0)	5(11.1)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(5.9)	
B <a href="http://www.sesame.com">www.sesame.com</a>	0(0.0)	0(0.0)	1(10.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(1.0)	
C <a href="http://www.doxy.me">www.doxy.me</a>	1(5.0)	2(4.4)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	3(3.0)	
D <a href="http://www.getweave.com">www.getweave.com</a>	0(0.0)	1(2.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(1.0)	
E <a href="http://www.Oncallhealth.com">www.Oncallhealth.com</a>	1(5.0)	1(2.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(2.0)	
<b>OVERALL MEAN NO (%)</b>	1.4(7.1)	2.2(4.8)	0.4(4.2)	0.2(1.2)	0(0.0)	0(0.0)	0(0.0)	4.2(4.1)	

Ethics in Teledentistry: Across cadres, respondents demonstrated impressive knowledge of ethical considerations in teledentistry, (83.2%). (Table 4)

**Table 4: The responses of respondents to ethical considerations in teledentistry**

CADRES									
PROMPTS	Consultants N=20 n (%)	Residents N=45 n (%)	House Officers N=10 n (%)	Dental Nurses N= 14 n (%)	Dental Therapist N=3 n (%)	Dental Techn. N=6 n (%)	Dental Surgery Asst. N = 3 n (%)	Total N =101 n (%)	
It is very important in the practice of teledentistry to									
1. Take informed consent	19(95.0)	41(91.1)	10(100.0)	13(92.9)	3(100.0)	5(83.3)	3(100.0)	94(93.1)	
2. Maintain an acceptable standard of care	18(90.0)	40(88.9)	9(90.0)	12(85.7)	3(100.0)	4(66.7)	3(100.0)	89(88.1)	
3. Build a casual and virtual relationship on teledentistry platform	13(65.0)	36(80.0)	7(70.0)	11(78.6)	3(100.0)	5(83.3)	3(100.0)	78(77.2)	
4. Maintain professional relationship and communication on the teledentistry platform	18(90.0)	44(97.8)	9(90.0)	12(85.7)	3(100.0)	5(83.3)	3(100.0)	94(93.1)	
5. Ensure patients' privacy and confidentiality when using teledentistry platform	17(85.0)	43(95.6)	10(100.0)	12(85.7)	3(100.0)	4(66.7)	3(100.0)	92(91.1)	
6. Be licensed to use teledentistry platform	14(70.0)	39(86.7)	10(100.0)	9(64.3)	1(33.3)	4(66.7)	3(100.0)	80(79.2)	
7. Ensure billing and reimbursement: Where you need to bill a patient/client when rendering services on teledentistry platform	13(65.0)	41(91.1)	9(90.0)	8(57.1)	1(33.3)	3(50.0)	0(0.0)	75(74.3)	
8. Professional services should be free on all teledentistry platform	17(85.0)	36(80.0)	8(80.0)	4(28.6)	2(66.7)	3(50.0)	0(0.0)	70(69.3)	
<b>OVERALL AVERAGE No (%)</b>	16.1(80.6)	40(88.9)	9(90.0)	10.1(72.3)	19(79.2)	4.1(68.8)	2.2(75)	84(83.2)	

**Barriers to the use of teledentistry:** Table 5 shows respondents response to the possible barriers to the use of teledentistry. Majority of the respondents (81.8%) expressed their opinions on the possible barriers of teledentistry which included a list of

questions that focused majorly on individual barriers. However, a few (18.2%) disagreed with the outlined barriers.

**Table 5: Distribution of correct responses to possible barriers to the use of teledentistry.**

	Consultants N=20 CADRE n (%)	Residents N=45 n (%)	House Officers N=10 n (%)	Dental Nurses N= 14 n (%)	Dental Therapist N=3 n (%)	Dental Techn. N=6 n (%)	Dental Surgery Asst. N= 3 n (%)	Total N=101 n (%)	
The following are barriers that could be encountered in the practice of Teledentistry.									
1	Limited access to technology	18(90.0)	44(97.8)	9(90.0)	10(71.4)	2(66.7)	5(83.3)	3(100.0)	91(90.1)
2	Concerns about security and privacy	17(85.0)	36(80.0)	9(90.0)	9(64.2)	2(66.7)	6(100.0)	3(100.0)	82(81.2)
3	Regulatory challenges	14(70.0)	37(82.2)	5(50.0)	9(64.2)	2(66.7)	4(66.7)	3(100.0)	74(73.3)
4	Inability to perform hands on procedures remotely	18(90.0)	43(95.0)	7(70.0)	7(50.0)	3(100.0)	5(83.3)	2(66.7)	85(84.2)
5	Some persons may prefer traditional in-person dental visit.	16(80.0)	41(91.1)	9(90.0)	9(64.2)	3(100.0)	5(83.3)	2(66.7)	85(84.2)
6	There can be disparity in digital literacy among both the dental professionals and patients	19(95.0)	42(93.3)	10(100.0)	8(57.1)	2(66.7)	5(83.3)	3(100.0)	89(88.1)
7	Not all dental professionals can afford to implement it in their practice	15(75.0)	37(82.2)	7(70.0)	9(64.2)	3(100.0)	5(83.3)	2(66.7)	78(77.2)
8	High cost of telecommunication equipment	17(85.0)	36(80.0)	7(70.0)	11(78.6)	3(100.0)	6(100.0)	3(100.0)	83(82.2)
9	Extra time and cost of appropriate training	15(75.0)	36(80.0)	6(60.0)	9(64.2)	2(66.7)	6(100.0)	2(66.7)	76(75.3)
<b>OVERALL AVERAGE No (%)</b>		16.5(82.7)	39.1(86.8)	7.7(76.7)	9(64.2)	2.4(81.5)	5.2(87.0)	2.6(85.2)	82.6(81.8)

## DISCUSSION

**Findings:** This study recruited 101 dental professionals practicing at the dental center of OAUTHC Ile-Ife, comprising 20 (19.8%) consultants, 45 (44.6%) resident doctors, 10 (9.9%) house officers, 14 (13.9%) dental nurses, 3 (2.9%) dental therapists, 6 (5.9%) dental technologists, and 3 (2.9%) dental surgery assistants. The sample included 36 (35.6%) females and 65 (64.4%) males, with a female-to-male ratio of 1:1.8. The majority of respondents (41.6%) were aged 31-40 years. The assessment revealed an average level of awareness (49.9%) and a low level of teledentistry use (4.1%) in oral healthcare delivery among dental healthcare professionals at OAUTHC Ile-Ife. These findings align with a study by Ngwu et al.<sup>21</sup> in South-Eastern Nigeria, which reported that 68.3% of dental professionals had never heard of teledentistry, indicating similarly low awareness. This may be attributed to teledentistry being a relatively new concept in Nigeria and many other developing countries.<sup>22</sup> Additional factors include limited exposure to technological innovations, the high cost of telemedical equipment, and restricted internet access in Ile-Ife, Osun State. These results correspond with a study from Ebonyi State, Nigeria, which reported low awareness (31.6%) and no use (0.0%) of teledentistry among dental professionals, citing poor infrastructure, inadequate training, and limited exposure.<sup>21</sup> The particularly low awareness among non-dentist dental professionals underscores the need for targeted educational initiatives for these cadres of oral health workers.

Over the years, teledentistry has demonstrated significant potential for improving access to oral healthcare services and reducing disparities between rural and urban communities.<sup>13</sup> In developing countries like Nigeria, where transportation is challenging and costly, studies have shown that teledentistry can minimize travel expenses, providing a cost-effective means for preoperative evaluation, treatment, and follow-up.<sup>23</sup> Nigeria's large population and inadequate dentist-to-population ratio highlight the urgent need for interventions to address oral health inequalities. Tertiary institutions like OAUTHC play a crucial role in training professionals who provide oral healthcare nationwide. Understanding the knowledge, awareness, and use of teledentistry in this population is essential for assessing knowledge transfer to trainees and ultimately mitigating oral health disparities in Nigeria.

Respondents' perceptions of teledentistry, assessed using 17 prompting questions, revealed general agreement across all cadres regarding its potential roles in oral healthcare delivery. These findings align with Wood et al. (2015)<sup>24</sup> and Daniel & Kumar (2014),<sup>25</sup> who reported that teledentistry effectively enhances access to oral healthcare in underserved areas by supporting diagnosis, consultation, education, and follow-up. Senior dental professionals (consultants and resident doctors) expressed stronger agreement regarding teledentistry's potential for expert consultation and its likely acceptance if introduced. These responses may reflect their advanced training and clinical

experience, while other cadres may have limited exposure to these possibilities, influencing their perspectives.

The use of common teledentistry devices and platforms among dental professionals was low (4.1%), likely due to limited awareness of available platforms and their potential applications. Most respondents reported familiarity only with basic phone functions (texting, calling) and social media platforms like WhatsApp and Facebook. This finding corresponds with Ngwu et al. (2021),<sup>21</sup> who noted that most communication with patients occurred through smartphones and social media. Introducing dedicated teledentistry platforms should be a priority in future training programs. Respondents demonstrated strong ethical awareness, recognizing that teledentistry adoption requires careful attention to ethical and legal considerations. They emphasized the importance of protecting patient privacy and obtaining standard informed consent.

Approximately 81.8% of respondents identified potential barriers to teledentistry implementation, primarily focusing on individual-level challenges. These barriers could be addressed through user-friendly, affordable technology and digital literacy training programs. Additionally, teledentistry for patient follow-up should be limited to those previously examined in person.<sup>26</sup> Technical barriers such as human errors and low-quality information could be mitigated through artificial intelligence (AI), which offers enhanced remote screening, diagnosis, record-keeping, and monitoring capabilities.<sup>27</sup>

**Implications:** The moderate level of awareness and low use of teledentistry software highlights the need for reinforced integration into all departments of university teaching hospitals to ensure rapid adoption. Ethical considerations must be emphasized, including maintaining care standards, professional relationships, and appropriate digital communication.

**Trade-Offs (Limitations):** The single-center design may limit generalizability; however, these findings may apply to teaching hospitals in similar settings with comparable staff compositions.

**Take-Home (Conclusion):** Dental healthcare professionals at OAUTHC, Ile-Ife, Osun State, Nigeria, demonstrate moderate awareness of teledentistry and its potential benefits. However, approximately half of the population had no prior knowledge of teledentistry, and its use in oral care delivery was very low (4.1%).

**Expectations for Future Research:** Future studies should adopt a multi-center design and include other healthcare professionals to provide a more

comprehensive understanding of current knowledge and necessary interventions.

**Recommendations:** To fulfill its potential, teledentistry must be incorporated into the training curriculum for all dental professional cadres. Including dentists and other team members reflects feasibility and acceptance, while assessing their awareness, acceptance, and practice is critical for successful integration into oral healthcare delivery.

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**Data Availability:** The authors are not willing to share data for ethical reasons, as respondents did not consent to data sharing.

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