

Knowledge and attitudes of oral health care workers on HIV-associated oral lesions: A study at PHC facilities in Gauteng

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ABSTRACT

Background

Oral health care workers (OHCWs) are critical in providing holistic treatment and preventing the spread of HIV disease. They are uniquely placed to identify, diagnose, manage and treat HIV-related oral lesions.

Aim

To determine oral health clinicians' knowledge and attitudes towards HIV-associated oral lesions.

Methodology

A descriptive cross-sectional survey was conducted at Gauteng's primary health care (PHC) facilities. Data collection targeted the three categories of OHCWs – dentists, dental therapists and oral hygienists.

Results

The response rate was 67.5% (n=110), majority of the participants, 76.4% (n=84), were female. Nearly all participants, 91.8% (n=100), agreed that oral lesions are common in people living with HIV and AIDS (PLWHA) and that early diagnosis of HIV/treatment increases PLHIV's life expectancy. More than three-quarters (80%) reported that they had no problem treating patients diagnosed with HIV. Almost a third, 36.4% (n=40), listed necrotising periodontal conditions and oral candidiasis 34.5% (n=38) as the most common oral manifestations. Most respondents correctly identified oral candidiasis (92.7%), Kaposi sarcoma (84.5%) and necrotising ulcerative periodontal conditions (80.9%).

Conclusion

Although OHCWs had sound knowledge of oral manifestations of HIV, training programmes must be prioritised for knowledge transfer. Dental facilities can be used as a health-promoting platform and a viable location for provider-initiated testing and counselling (PICT) and client-initiated counselling and testing (CICT), also known as voluntary counselling and testing (VCT). The use of HIV rapid testing kits is an option to be explored in the dental facility by OHCWs.

Keywords

Oral health clinicians (OHC), oral manifestations, HIV, AIDS, knowledge and attitudes

BACKGROUND

The mouth is perceived as the mirror of a patient's overall health; it may manifest with symptoms that alert a clinician to an underlying systemic condition such as diabetes, sexually transmitted infections, anaemia and Sjogren's syndrome.¹ Literature has shown that Human Immunodeficiency virus (HIV) infection causes oral lesions.² An estimated 67% of the 38.4 million people living with HIV (PLWH) globally in 2021 were from Sub-Saharan Africa. Sub-Saharan Africa was responsible for 670,000 of the 1.5 million new infections and 280,000 of the 650,000 AIDS-related deaths reported globally in 2021.³ With an estimated 7.8 million people living with HIV in 2023, South Africa has the world's largest and most visible HIV epidemic.⁴ There were 160,000 new HIV infections in South Africa in 2022, and 45,000 people died from AIDS-related illnesses.⁵ The prevalence of HIV in South Africa remains high with the infection stratified according to gender. The most pronounced differences in HIV prevalence by gender were seen among younger populations which calls for focused interventions. Compared to males of the same age groups, HIV prevalence was approximately two-fold in females aged 15-19 years (5.6% vs 3% respectively) and 20-24 years (8% vs 4% respectively) and three-fold higher in females aged 25-29 (20% vs 6% respectively).⁴

Despite the abundance of literature on HIV oral manifestations, literature is scant on oral health care workers' (OHCWs) knowledge and the efficacy of their management of oral HIV lesions in a country like South Africa. Oral health care workers ought to have knowledge of the HIV disease process, its oral manifestations and modes of transmission as they are strongly associated with patient readiness to receive treatment and management thereof.¹

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There is a link between oral health and systemic infections, and that has prompted a call for all healthcare providers to increase their knowledge of oral health; thus the World Health Organization (WHO) oral health programme has emphasised the importance of oral examinations for all patients to reduce common health problems, such as HIV disease.^{2,6} Between 70% and 90% of HIV-infected people will have at least one oral manifestation during the infection, and OHCWs regularly encounter patients with oral lesions associated with HIV and require adequate knowledge of these conditions for diagnosis and management.^{1,7}

Oral lesions associated with HIV presenting in undiagnosed individuals may indicate early clinical signs of HIV infection; they also predict disease progression and may be indicative of HAART non-compliance and are clinical markers for HIV staging and classification.^{2,7}

In 1994, the European Economic Community-Clearinghouse (EEC-Clearinghouse) on oral problems related to HIV infection and the WHO Collaborating Centre on oral manifestations of the human immunodeficiency virus classified these lesions into three distinct groups and in 1993 revised their classification, which is currently in use.⁸⁻¹⁰

Group 1 Lesions that are strongly associated with HIV infection:

- Oral candidiasis (erythematous, pseudomembranous and angular cheilitis)
- Oral hairy leucoplakia
- Periodontal diseases (linear gingival erythema, necrotising gingivitis and periodontitis)
- Non-Hodgkin's lymphoma
- Kaposi sarcoma

Group 2 Lesions less commonly associated with HIV infection:

- Melanotic hyperpigmentation
- Ulcer not otherwise specific
- Herpes simplex virus infection
- Herpes zoster
- Decreased salivary flow rate

Group 3 Lesions seen in HIV infection:

- Recurrent aphthous ulcers
- Molluscum contagiosum
- Lechenoid reactions
- Facial palsy
- Erythema multiform

Care providers' negative attitudes and biases toward people living with HIV are reported across the world with care providers also admitting reluctance among some to provide adequate care to people who are HIV positive.¹¹ Oral health care workers' attitudes towards patients living with HIV are formed primarily through a learning process which can take several forms, including classical conditioning, operant conditioning, observational learning and imitation.¹² It is therefore important that the knowledge and attitudes of OHCWs towards HIV be assessed in clinical settings in South Africa. The study, therefore, sought to determine the knowledge and attitudes of oral health clinicians on HIV-associated oral lesions in primary health care (PHC) facilities in Gauteng. To the authors' knowledge, this study has never been undertaken in PHC facilities in Gauteng.

MATERIALS AND METHODS

Study design and population

Ethical approval was obtained from the University of the Witwatersrand Johannesburg human research ethics committee (Ref M210831A). No personal details of the participants were disclosed, and all information was strictly confidential and anonymous. A descriptive cross-sectional study was conducted at primary health care facilities across Gauteng province in 2022. The survey population included dentists, dental therapists and oral hygienists referred to as oral health care workers. The Gauteng province is divided into five districts namely Tshwane, Ekurhuleni, West Rand, Joburg Metro and Sedibeng and the populations of the study were invited from all the five districts.

The recently updated estimates of OHCWs in Gauteng indicated a total of two hundred and eighty (280). The Raosoft software was used for computing the sample size (Raosoft,2004).¹³ With the margin of error of 5% and the confidence level at 95% a representative sample was calculated to be 163 participants. The ages of the participants were grouped into three, being 21-30, 41-40 and >40 age groups.

Data collection

A pretested, self-administered questionnaire was used to collect information on the sociodemographic characteristics, knowledge and attitude of oral health care workers regarding HIV-associated oral lesions.¹¹ Participants were, for example, asked to list five common oral lesions associated with HIV, given pictures of HIV-associated lesions for identification and asked if they could get infected with HIV from a needle stick injury, to test their knowledge. To test their attitudes, questions were asked such as can they safely treat patients with HIV, whether they fear or are concerned with treating patients with HIV because of fear of infection, and if they think patients infected with HIV should have their files specifically marked so that they as health workers should be aware to take specific protective measures.

The analytical tool used was SPSS Version 28 software. Quantitative variables were summarised as proportions, frequencies and mean with standard deviations, ranges and percentages. A Chi-squared test was utilised to test the association between variables. The level of significance was set at $p \leq 0.05$.

RESULTS

Demographic profile of participants

Out of the estimated representative sample of 163, there was a 67.5% (n=110) response rate. The majority of participants (76.4%) were female. The majority age range of the participants was the >40 age group. Nearly two-thirds (65.5%) were dentists. Just over half (53.6%) had work experience of fewer than 10 years. More than a third (35.5%) worked in the Tshwane metropolitan area, and nearly half (44.5%) were practising in clinics. Nearly all (95.5%) of the participants worked full time. Other demographic features are listed in Table 1.

Knowledge

The majority of respondents (91.8%) agreed that oral lesions are common in people living with HIV and AIDS (PLWHA) and that early diagnosis/treatment increases PLWHA's life expectancy. More than a third (36.4%) listed necrotising periodontal conditions and oral candidiasis (34.5%) as

Table 1: Demographic profile of participants (n=110).

Demographic characteristics		Frequency (n/%)
Gender	Male	26 (23.6)
	Female	84 (76.4)
Age group	21-30 years	30 (27.3)
	31-40 years	39 (35.5)
	>40 years	41 (37.3)
Occupation	Dentist	72 (65.5)
	Dental therapist	21 (19.1)
	Oral hygienist	17 (15.5)
Position	Full time	105 (95.5)
	Part time	5 (4.5)
Experience	0-5 years	32 (29.1)
	6-10 years	19 (17.3)
	>10 years	59 (53.6)
District	Tshwane	39 (35.5)
	Ekurhuleni	25 (22.7)
	West Rand	11 (10.0)
	Johannesburg Metro	19 (17.3)
	Sedibeng	16 (14.5)
Area	Clinic	49 (44.5)
	Community health centre	34 (30.9)
	Hospital	27 (24.5)

the most common oral manifestations observed. Most respondents correctly identified oral candidiasis (92.7%), Kaposi sarcoma (84.5%), necrotising ulcerative periodontal conditions (80.9) and nearly a third (27.3%) correctly identified Non-Hodgkin's lymphoma. The most common lesions seen in the participants' area of work can be seen in Table 2.

Dentists generally managed to correctly identify all the lesions except for Non-Hodgkin's lymphoma, as only 29% correctly identified it. Ninety-five percent (95%) of dental therapists managed to identify oral candidiasis lesions correctly. Oral hygienists (94%) also correctly identified oral candidiasis. See Table 3.

Table 2: Five common lesions associated with HIV frequently seen in your area of practice (n=110).

Common oral lesions	Frequency (n/%)
Kaposi sarcoma	11 (10)
Necrotising periodontal conditions	40 (36.4)
Non-Hodgkin's lymphoma	0 (0)
Linear gingival erythema	4 (3.6)
Oral candidiasis	38 (34.5)
Oral hairy leucoplakia	4 (3.6)
Other lesions	6 (5.5)
Unanswered	7 (6.5)

Table 3: Frequency of oral lesions correctly identified by category of clinicians (n=110).

Category	Lesions (n/%)						
	*KS	*NUG	Non-Hodgkin's Lymphoma	Linear erythema	Candidiasis	*NUP	Hairy leukoplakia
Dentist n=72	67(93)	60 (83)	21 (29)	54 (75)	66 (92)	62 (86)	57 (79)
Dental therapist n=21	14 (67)	13 (62)	3 (14)	11 (52)	20 (95)	16 (76)	14 (67)
Oral hygienist n=17	12 (71)	14 (82)	6 (35)	12 (71)	16 (94)	11 (65)	15 (88)

*KS (Kaposi sarcoma), *NUG (Necrotising ulcerative gingivitis), *NUP (Necrotising ulcerative periodontitis)

Table 4: Additional questions on knowledge of clinicians on HIV/AIDS.

Question	Response (n/%)
Western blot is a definite test for HIV/AIDS diagnosis	
Yes	35 (36.5)
No	24 (25)
I don't know	34 (38.5)
Saliva can be a vehicle for the transmission of HIV/AIDS (n=110)	
Yes	17 (17.7)
No	75 (78.1)
I don't know	4 (4.2)
Oral health care workers can act as an intermediary for the transmission of HIV (n=96)	
Yes	56 (58)
No	31 (32)
I don't know	9 (10)
Needle stick injury can transmit HIV	
Yes	94 (97.9)
No	1 (1)
I don't know	1 (1)
HIV can be transmitted through aerosols by handpieces	
Yes	24 (25)
No	70 (72.9)
I don't know	2 (2.1)

Nearly two-thirds (63%) perceived the risk of contracting HIV in the dental clinic to be high. Nearly all participants (97.3%) think needlestick injury can transmit HIV. Most of the participants (80%) think the dental staff are more prone to cross-contamination.

Attitudes

More than three-quarters (80%) reported that they had no problem treating patients diagnosed with HIV, 8% were uncomfortable treating the patients and 12% reported not being sure. The majority (80.9%) felt that all patients with HIV-associated oral lesions must be referred to the relevant department and handled by dental staff.

More than two-thirds of respondents (70.9%) thought introducing HIV testing in the dental facility was feasible and would improve the patient's prognosis. Close to half of the participants thought rapid HIV testing and HIV counselling needed to be routine in the dental facility, 41.8% and 47% respectively. See Table 5.

Associations concerning knowledge

The association between correctly identifying the lesion and the category of the clinician can be seen in Table 6.

Significantly more dentists were able to correctly identify Kaposi sarcoma, followed by oral hygienists, $p=0.001$. As far as linear gingival erythema was concerned significantly more dentists, followed by oral hygienists, were able to correctly identify it as compared to dental therapists, $p=0.002$. For both lesions dental therapists performed the least. As far as necrotising gingivitis, Non-Hodgkin's lymphoma, oral candidiasis, necrotising ulcerative periodontitis and hairy leukoplakia there was no difference in correctly identifying the lesions whether one was a dentist, oral hygienist or dental therapist, $p>0.005$.

There was no association between knowledge and area of practice, knowledge of the testing for HIV, age category and length of experience, $p>0.005$.

Associations concerning attitude

Association between attitude and the level of experience of the clinician in connection with the need to avoid treating an HIV positive patient and sending them elsewhere can be seen in Table 7.

Statistically more than half the clinicians with more than 10 years of experience had a positive attitude of treating the patients who are HIV positive and not sending them away to someone else to avoid treating them, $p=0.005$. Twenty-nine percent (29%) of the respondents with 0-5 years of experience would like to send HIV-positive people to be treated by someone else in order to avoid treating them.

Association between attitude and category of staff who wanted files to depict HIV status

There was no association between attitude and category of staff who wanted patients' files marked with HIV status, $p=0.521$. This is despite the fact that the majority of staff who thought this was not a good idea participated (61%). See Table 8.

DISCUSSION

Oral health care workers play an essential role in the management of HIV/AIDS. Oral manifestations are frequently the first signs of HIV infection and play a crucial role in predicting disease progression. Oral health care workers ought to enhance their knowledge about the disease, its oral manifestations and management to provide effective clinical management. Appropriate knowledge may also instil confidence in the ability of the oral health clinician to manage oral manifestations of HIV/AIDS.

Table 5: Attitudes of OHCW on HIV/AIDS patients.

Question	Response (n/%)
Introducing HIV testing in the dental facility is feasible and will assist the patient's prognosis (n=110)	
Yes	78 (70.9)
No	12 (10.9)
I don't know	20 (18.2)
Rapid HIV testing on dental patients' needs to be a standard procedure performed by oral health clinicians (n=110)	
Yes	46 (41.8)
No	38 (34.5)
I don't know	26 (23.6)
Need for formal training (n=96)	
Yes	91 (95)
No	1 (1)
I don't know	4 (4)
Counselling to be introduced as a routine (n=96)	
Yes	45 (47)
No	27 (28)
I don't know	24 (45)
Marking of files to depict HIV status (n=96)	
Yes	25 (26)
No	63 (66)
I don't know	8 (8)
Confidence in treating HIV-positive patients (n=96)	
Not much	4 (4)
Average	59 (62)
Very confident	33 (34)
Patients with HIV-associated oral lesions must be referred to the relevant medical speciality and not handled by dental staff (n=110)	
	YesNoI don't know
0-5 years of experience	225532 (29)
6-10 years of experience	513119(17)
More than 10 years of experience	651259 (54)

Not all respondents responded to all questions and therefore the different populations (n) for different questions.

About half (53.6%) of the participants in the study had work experience of >10 years in public service. This may be because most qualified oral health practitioners stay in public service for various reasons, including job security and comfort.¹⁴ Yet the gaps identified warrant the need for an urgent invention in the continued professional development of oral manifestations associated with HIV/AIDS.

KNOWLEDGE

Overall, respondents in this study illustrated sound knowledge of oral manifestations of HIV/AIDS. However, there were some significant yet disturbing gaps in knowledge as 40.9% of the respondents did not know that western blot is a definite test for HIV/AIDS diagnosis and 23.6% of the participants agreed that HIV could be transmitted

Table 6: Association between correctly identifying lesions and the category of the clinician (n=110).

Category	Lesions (n/%)						
	KS	NUG	Non-Hodgkin's	Linear	Candidiasis	NUP	Hairy leukoplakia
Dentist n=72	67 (93)	60 (83)	21 (29)	54 (75)	66 (92)	62 (86)	57 (79)
Dental therapist n=21	14 (67)	13 (62)	3 (14)	11 (52)	20 (95)	16 (76)	14 (67)
Oral hygienist n=17	12 (71)	14 (82)	6 (35)	12 (71)	16 (94)	11 (65)	15 (88)
p-value	0.001	0.218	0.113	0.002	0.396	0.326	0.08

Table 7: Association between level of experience and the need to treat HIV-positive patients and not to refer them somewhere else (n=110).

Experience	Yes	No	I don't know	(n/%)	P-value
0-5 years of experience	2	25	5	32 (29)	0.005
6-10 years of experience	5	13	1	19 (17)	
More than 10 years of experience	6	51	2	59 (54)	
Total n(%)	13 (12)	89 (81)	8 (7)	110 (100)	

by aerosols through handpieces. Aerosol transmission is considered the least likely cause of infection as it does not lead to any HIV seroconversion.¹⁵ Similarly, a study conducted among medical professionals in India revealed that there was a significant level of incomplete knowledge of HIV/AIDS infection.¹⁵

However, the study revealed that participants had significant knowledge about the transmission of HIV and the modes of transmission as 75.5% of the participants did not agree that saliva can be a vehicle for the transmission of HIV/AIDS.¹⁶ Saliva has a relatively low viral load; thus, OHCWs have a lower risk of being infected with HIV through saliva.¹⁷ Some study participants (58%) believed that OHCWs can act as intermediaries for the transmission of HIV. This general misconception is consistent with other studies.¹⁸⁻²⁰

The most commonly observed oral lesion was necrotising ulcerative gingivitis (seen by 36.4% of respondents), followed by oral candidiasis at 34.5%. Contrary to other studies, oral candidiasis was the most commonly observed oral lesion in HIV-infected patients.²⁰⁻²¹ Oral candidiasis is the most common lesion linked to HIV disease progression. Candidiasis presents on the oral mucosa during the early stages of HIV and may indicate early HIV infection. It may also be a warning sign of immunological and virologic failure in patients receiving highly active antiretroviral therapy (HAART).²²

To further test the participants' knowledge, they were asked to identify seven unlabelled photographic images depicting lesions strongly associated with HIV. More than three-quarters of the participants correctly identified the two lesions strongly associated with HIV, Kaposi sarcoma (84.5%) and oral hairy leucoplakia (78.2%). Nearly all participants in the present study correctly identified oral candidiasis as the most common oral HIV lesion, similar to other studies.²¹⁻²² Regardless, this shows that OHCWs need more training in recognising such lesions to avoid delayed diagnosis, which can result in poor health and quality of life due to discomfort, dysfunction and impairment.^{14, 25}

Attitudes

While numerous studies have been conducted on the knowledge, attitudes and practices of dentists concerning HIV/AIDS, few have focused on other OHCWs such as dental therapists, oral hygienists and dental assistants.

The present study found that an overwhelming majority did not mind treating PLWHA. This might be related to the high prevalence of HIV in South Africa and the frequency of dental care provision to PLWHA. These are commendable findings and suggest the level of trust between the patients and the OHCWs and their knowledge of the disease process.²⁶ A Canadian study by McCarthy et al. (1999) indicated adequate knowledge of HIV/AIDS and awareness of the ethical responsibility to treat (all) patients as factors associated with willingness to treat patients.²⁷ The high response on willingness to treat concurred with other studies,^{19,28-32} but is contrary to a much earlier South African study in which only 45% reported willingness to deliver dental care to HIV-positive patients.²² In 2006, a study also reported that although there was a growing acceptance to the management of PLWHA, dentists still experienced a moderate to extremely high fear and anxiety of transmitting HIV to oneself or other patients.³³ This difference in the findings may be explained by the current wealth of knowledge on HIV and its transmission routes, which was very low in the early 1990s. The high willingness reported in the present study may indicate that OHCWs are aware of their ethical obligation to provide treatment to all patients.

CONCLUSION

Overall, participants in this study illustrated sound knowledge of oral manifestations of HIV/AIDS. However, there were some significant gaps in knowledge. The study also revealed that participants had sufficient knowledge about the transmission of HIV and the modes of transmission.

While most OHCWs showed a willingness to treat HIV/AIDS patients and displayed good attitudes in managing oral lesions associated with HIV, specific considerations such as the patient's referral for further management may be made due to the patient's compromised immune state. However, training programmes should continue to prioritise knowledge transfer on basic HIV/AIDS concepts, particularly transmission. Based on the increase in the prevalence and incidence of HIV cases, oral healthcare workers are likely to be exposed to oral manifestations. Improving OHCW skills in diagnosing and managing HIV/AIDS oral manifestations cannot be overstated. There is a need to increase awareness of clinical signs and symptoms of underlying infection and the ability to detect them and refer patients for additional testing.

Table 8: Association between attitude and category of staff pertaining to marking of files (n=110).

Files marked	Dentist	Dental therapist	Oral hygienist	Frequency (%) (n=110)	P-value
Yes	24	6	3	33 (30)	p=0.521
No	42	14	11	67 (61)	
Not sure	6	1	3	10 (9)	
Total	72	21	17	110 (100)	

In a nutshell, better-structured education targeted at all healthcare professionals working in both rural and urban hospital settings, apart from classroom teaching, in the form of health talks/seminars, in-service training, continuing medical education, quizzes and debates would improve the HIV/AIDS knowledge of health care providers most efficiently and effectively but also contribute towards ending the HIV/AIDS epidemic.¹⁶

LIMITATIONS

While KAP methodology surveys help research general public health information on knowledge and treatment practices, it has been criticised for several reasons, including its ability to measure attitudes and practices. Often participants gave responses that they believed were acceptable to the researcher resulting in acquiescence bias. Therefore, the answers may not have been a true reflection of the actions of OHCWs. The KAP methodology has also been criticised for the rigid nature of the questionnaire design with very few open-ended questions. In some instances, participants had few choices with the close-ended questions and were limited in their responses. The colour photographs used to depict oral lesions were not accompanied by patients' medical histories and may have limited diagnostic abilities. Also, cross-sectional studies' limitation includes their inability to assess the incidence and make causal inferences.

RECOMMENDATIONS

The study provides additional insight into the knowledge and attitudes of this critical group of health care workers. Particular emphasis should be placed on developing skills for OHCWs in the areas of communicating with and counselling HIV/AIDS patients. Integrating these topics into undergraduate curricula, induction workshops and continuous professional programmes would be advantageous.³⁴

HIV risk assessments of OHCWs frequently focus solely on the occupational risk of transmission, ignoring other potential contributory factors such as gender. The dental surgery should be used as a health-promoting platform and a viable location to investigate preventive strategies such as voluntary counselling and testing (VCT) as well as provider-initiated testing and counselling (PCT).¹⁶ The use of HIV rapid testing kits is an option to be explored in the dental facility by OHCWs.

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