Awareness and knowledge of oral cancer amongst dental therapists in Nigeria: a pilot study

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Abstract

Objective: One of the most important disease conditions of interest to the dental profession is oral cancer - a malignant condition affecting the mouth and pharynx that has fast become a global health issue. Dental therapists are a group of oral health professionals that could be instrumental in prevention and early detection of oral cancer due to their closeness to the community and scope of clinical practice. The objective of the study was to assess the awareness and knowledge levels of oral cancer amongst Dental Therapists in Nigeria.
Method: This was a cross-sectional descriptive study using a structured self-administered questionnaire to assess the awareness of oral cancer in a population of dental therapists practicing in Nigeria as at April 2013. The questionnaire consisted questions that assessed the knowledge of signs and symptoms, risk factors and diagnostic procedures of oral cancer.
Result: A total of 104subjects aged between 20 and 55(Mean 31.5±8.84 SD) participated in the study. Seventy-Seven (74.0%) had spent greater than 20 years in practice. A relatively high number of subjects had high knowledge indices about signs and symptoms and risk factors, but there were poor knowledge indices on the diagnostic procedures scale and overall oral cancer knowledge scales.
Conclusion: Practicing dental therapists constitute an obviously usable cadre of dental ancillary staff that can be employed in preventing and detecting oral cancer early, due to their closeness to the community and scope of clinical practice. Gaps in knowledge need to be closed by aggressively exposing practicing dental therapists to trainings that will improve their understanding of the signs and symptoms, risk factors and diagnostic procedures of oral cancer.

Key words: Oral Cancer, Prevention, Early detection, Dental Therapists

Introduction

The dental profession involves the study, diagnosis, prevention and treatment of diseases, disorders and conditions involving the oral cavity and surrounding structures[1]. One of the most important of these conditions is oral cancer - a malignant condition affecting the mouth and pharynx[2] that is fast becoming a global health issue. There exists a distinct advantage if it can be prevented or detected early - as the percentage of people surviving five-years after diagnosis corresponds to the stage of the cancer at the time of diagnosis;[3] and treatment of established oral cancer can produce significant functional impairment in speech, mastication, swallowing, and even the ability to interact socially[4]. Unfortunately, most cases present or are diagnosed at advanced stages, largely due to lack of information on signs and symptoms of oral cancer among groups[5].

The death rate from oral cancer is estimated by the International Agency for Research on Cancer (IARC)[6] to be as high as 46.5%, which is, disappointingly, much worse than other visually examinable cancers such as melanoma (25.5%) and thyroid (25.1%); and hardly better than less examinable forms of cancer such as colon-rectal (51.7%) and uterine (46.7%) cancers. One of the main causes of this paradox appears to be general lack of awareness towards oral cancer both among the general population and some health care professionals[7].

Being one of the most debilitating and disfiguring of all cancers, a comprehensive oral cancer examination is recommended every 3 years for those 20-39 years of age, and annually for individuals 40 years of age and over, to aid early detection and reduce the associated morbidity and mortality[4,8]. This examination is easily performed, does not waste time and can be performed by ancillary health professionals with minimal amount of education and training. Dental therapists, with their close links to dentists[1], are a group of dental professionals well suited to perform such an examination. This examination can be performed before or after an oral prophylaxis session, and before or after a patient has seen the dentist.

The public health importance of oral cancer is also highlighted by the availability of potentially modifiable risk factors that can be focused on to ensure its preventability. Documented risk factors for oral cancer include tobacco use, habitual chewing of kolanut, chronic use of alcohol, malnutrition, and diets deficient in fruits and vegetables[9]. Dental therapists can help in creating awareness amongst patients about dietary and lifestyle factors that contribute to prevention. They are well suited for this task, as oral health education and promotion traditionally makes up a large part in the dental therapists role in modern societies[10].

The authors' aim was to assess the level of awareness and knowledge of risk factors, sign and symptoms and diagnostic procedures of oral cancer amongst dental therapists in Nigeria. The findings could serve as baseline data in the training and mobilization of this group of oral health care providers for oral cancer screening exercises in the country.

Materials and method

The study was conducted with a cross sectional descriptive study to assess the awareness and knowledge of oral cancer in a population of dental therapists drawn from, and practicing in, all zones and regions of the country. Ethics committee of Aminu Kano Teaching Hospital Kano gave ethical approval and all the participants gave informed verbal consent in accordance with the principles outlined in the Declaration of Helsinki.

Data collection was done in a purposive manner to complete the calculated sample size of 100 and capture a nationally representative sample. Therapists attending a three-day national workshop organized by the Nigerian Therapists Board in Ilorin, Kwara State, Nigeria, filled a structured questionnaire in April 2013. The questionnaire was adapted from a previous one used in a similar assessment of Traditional herbalists and other health workers in Kano, Nigeria, in 2012[11].

Ninety-two of the 100 therapists who attended the workshop were studied. Twelve therapists practicing in Kano State, Nigeria, who assembled for an Atraumatic Restorative Treatment Training workshop at Aminu Kano Teaching Hospital at about the same period, and who had not attended the Ilorin conference, were also administered the same questionnaire.

Information was obtained on socio-demographic characteristics of the subjects; knowledge of signs and symptoms of oral cancer; risk factors, diagnostic procedures and need for further training on oral cancer awareness. For all categories investigated, a knowledge scale was instituted by allotting a score of 1 to every correct response and a score of 0 to incorrect responses, and summed up to give a total score. Scales were tested in the previous study where they were adapted from.

For the 'Knowledge about signs and symptoms scale', the total score was 8 and subjects were classified into 2 groups: Those with adequate knowledge (more than 50% correct responses) and those with inadequate knowledge (50% or less).

Figure 1. Calculating an overall knowledge scale for study subjects

Variable	Adequate	Inadequate
Knowledge of SS		
Adequate	* * *	* *
Inadequate	* * *	
Knowledge of DP		
Adequate	* * * * *	*
Inadequate	*	* *
Knowledge of RF		
High	* * *	
Moderate	*	* *
Low		* *

SS = Signs and Symptoms; DP = Diagnostic procedures; RF = Risk factors

Statistical analyses were performed using Microsoft Excel for Mac and SPSS for Mac (version 18.0 SPSS Inc., Chicago, IL). Univariate analyses for demographic variables and knowledge of oral cancer were processed as simple percentages and frequencies. Results were expressed in absolute and relative frequencies. A two- sided significance of 5% was applied.

The "Knowledge about diagnostic procedures scale" also had the same 2 groups and the same total score.
The "Knowledge about risk factors scale" had a total obtainable score of 14, and was classified into 'Low', 'Medium' and 'High'; with scores of 0 6, 7 10 and 11 - 14 respectively.
An overall 'qualitative knowledge' scale was constituted incorporating the three knowledge scores just measured. If a respondent had adequate (or high) knowledge on any 2 scales, he was deemed to have adequate overall cancer knowledge. If he had inadequate knowledge categorization on any two scales, the opposite was inferred.
If a respondent had 1 adequate score on either of the "Knowledge of signs and symptoms" or "Knowledge of diagnostic procedures scales" and had a "high" score on the "knowledge of risk factors" scale, he was deemed to have adequate knowledge. A single adequate score in the other two scales in combination with either a medium or low categorization on this scale was deemed "inadequate" **(Figure 1)**.

Result

Characteristics of the Study group
One hundred and four (104) dental therapists aged 20 to 55 years (mean: 31.5 ± 8.84 years) participated in the study. Sixty-four (61.5%) were males and (56.7%) were above 40 years of age (56.7%). None of them had ever heard of or attended a continuing education course on oral cancer **(Table 1)**.

Table 1. Demographic characteristics of the respondents (N=104)

Variable	Number	%	Mean±SD
Gender			
Male	64	61.5	
Female	40	38.5	
			42.3± 4.84
Age group			
20-29years	17	16.4	
30 39 years	28	26.9	
≥40 years	59	56.7	
Practice type			
Private clinic	17	16.3	
Health center	28	26.9	
General Hospital	22	21.2	
Tertiary Institution	27	26.0	
Others	10	9.6	
			16.00 ± 4.15
Years of practice			
0 -10 years	13	12.5	
11 - 20 years	14	13.5	
≥ 20 years	77	74.0	
Location			
North-west Zone	16	15.4	
North-east Zone	3	2.8	
North-central Zone	11	10.6	
South-south Zone	9	8.7	
South-east Zone	29	27.9	
South-west Zone	36	34.6	

Current Knowledge of Signs and symptoms
Respondents were asked to identify correct signs or symptoms of oral cancer using 'yes' and 'no' responses. **(Table 2**) summarizes our findings on participants' knowledge of signs and symptoms of oral cancers.
'A sore in the mouth that bleeds easily and does not heal' had the highest number of correct responses with 79 (76.0%) each.
Seventy (67.3%) of the respondents had adequate knowledge (Knowledge of 50% or more) on the 'Knowledge of signs and symptoms scale' earlier mentioned. The average score was 5.4, standard deviation 2.1, with a range of 1 to 8 (Total score 8). The modal score received was 6 with 21 respondents receiving this score.

Current knowledge of risk factors
'Real risk factors', supported by evidence to increase the predisposition of an individual to oral cancer, and 'non-real risk factors' which have no confirmatory evidence, were asked about in a Yes and No format. **Table 2** shows non-real risk factors grouped below real risk factors.
When considering real risk factors, tobacco use was the most correctly identified risk factor [93 (89.4%)] and low consumption of fruits and vegetables [15 (14.4%)] was the least commonly identified.
When considering non-real risk factors, as many as 81 subjects (77.9%) correctly identified 'Spicy foods' and 'Poorly fitting dentures' as not increasing the risk, while only 34 subjects (32.7%) identified a 'family history of cancer' as not increasing the risk of developing oral cancer.
Most of the respondents had moderate knowledge [91 (87.5%)] on the 'Knowledge of risk factors scale'. Ten respondents had low knowledge scores. The average score was 7.91.2, with a range of 5 to 11 (Total score 14). The modal score received was 8 with 54 subjects receiving this score.

Current knowledge of diagnostic procedures
Eight diagnostic procedures as outlined in Table 2 were asked of the respondents in a 'Yes' and 'No' format. The number of correct responses given per question are as indicated. Knowledge about the individual diagnostic procedures was generally low.
On the 'Knowledge of diagnostic procedures scale', 28 (26.9%) of the respondents had adequate knowledge (Knowledge of more than 50%). The average score was 3.31.9, with a range of 0 to 8 (Total score 8). The modal score received was 3 with 22 respondents receiving this score and 21 respondents scored 4.

Overall knowledge scores and other variables
Overall knowledge about oral cancer as estimated revealed 22 (21.2%) respondents with adequate knowledge scores. The respondents opinions about oral cancer, and the relationships between other factors and the overall knowledge scores are as shown in **(Tables 3 and 4)**.

Table 2. Respondents with correct answers on knowledge about oral cancer

	Correctly indicated	
	N	%
Signs and Symptoms		
A sore in the mouth that bleeds easily and does not heal	79	76.0
A white or red patch on the gums, tongue or lining of the mouth	67	64.4
A lump or thickening in the cheek that can be felt with the tongue	72	69.2
Numbness of the tongue or other area of the mouth	75	72.1
Soreness or a feeling that something is caught in the throat	63	60.6
Difficulty chewing or swallowing	50	48.1
Risk factors (Non-real in italics)		
Tobacco Use	93	89.4
Use of alcohol	81	77.9
Older age	15	14.4
Prior oral lesions	42	40.4
Exposure to sunlight	41	39.4
Low consumption of fruits and vegetables	19	18.3
Occupational hazard	32	30.8
Spicy foods	81	77.9
Family history of cancer	34	32.7
Viral infection	68	65.4
Poor oral hygiene	60	57.7
Hot beverages and foods	98	94.2
Obesity	80	76.9
Poorly fitting dentures	81	77.9
Diagnostic procedures		
Patient sticks out tongue; posterior dorsum of tongue examined; pull tongue out; examine both sides; inspect underneath of tongue	64	56.3
Patient is asymptomatic in early oral cancer (OC)	53	65.0
Squamous cell most common type of OC	45	67.0
Ventral lateral border of tongue most likely site for OC	45	35.9
A white or red patch on the gums, tongue or lining of the mouth	44	57.3
When palpated a hard, painless, mobile or fixed lymph node is characteristic	33	70.0
Tongue & floor of the mouth most common site of OC	29	53.4
OC lesions most often diagnosed in advanced stages	28	26.2

Table 3. Respondents desire for continuing education courses

Characteristic	Frequency (n= 104)	Percentage (%)
Do you feel you have sufficient Knowledge		
Yes	36	34.6
No	68	65.4
More Information		
Yes	104	100.0
No	0	0.0
Which Format		
Information pack	0	0.0
Lectures	62	59.6
Seminars	32	30.8
Others	10	9.6

Discussion

To the best of our knowledge, this is the first survey on the awareness of oral cancer among dental therapists in Nigeria. The potential bias in sampling must be addressed, however, as attendees at a conference or a training workshop could introduce some selection bias. This may explain why a large percentage of the therapists captured by the study were aged above 40 or had practiced for periods greater than 20 years. In Nigeria, the likelihood of attending a conference, such as that at which data was collected, is enhanced by seniority in one's profession. The wherewithal necessary for interstate travelling may also most likely prohibit younger professionals from attending these conferences if they are not mandatory. Furthermore, if participants for such events were to be nominated, older, and more influential people in the profession would most likely be considered before.

Table 4. Overall knowledge scores vs. respondent characteristics and opinion.

Characteristic	Adequate	Inadequate	Significant
Age group (years)			
20- 29	2	15	Significant
30- 39	9	19	
40 or more	11		48
Years in Practice			
0 10 years	2	11	Significant
10 20 years	3	11	
>20 years	17	60	
Type of Practice			
Private clinic	2	15	Significant
Health center	1	27	
General Hospital	5	17	
Tertiary Institution	14	16	
Others	0	10	
Do you think you have sufficient knowledge about oral cancer?			
Yes	4	32	Significant
No	18	50	

At the time of data collection however, the total number of registered dental therapists in Nigeria was about 3000 (records from the Regulating Board), spread amongst a country of 150 million people (estimated from 2006 census figures). The prohibitive cost of embarking on a state-to-state tour to seek them out in rural and urban centers alike was not feasible, and contact via email or post was also difficult due to limited information about their current locations and status. The suitability or otherwise of these media in reaching those practicing in rural or semi-urban localities without electricity or internet facilities was also in question.

There is a documented relationship between the amount of time spent in one's profession and knowledge about subjects related to that profession[2,12-13]. Such a relationship could be positive due to experience gathered during years of practice; or negative due to constant posting to different areas removal from formal training. The relationship of increasing age and years in practice with declining knowledge of the subject matter was statistically significant in this study for example, contrary to a study by Yellowitz et al[12]. Despite **Table 1** indicating that each zone of the country was represented adequately, this potential selection bias may reduce the generalizability of the results of this study to the whole therapist population.

Dental therapists in Nigeria undergo a three-year training and are able to independently carry out few dental procedures, in addition to oral prophylaxis and dental health education, thus playing a key role in oral health care delivery in the country[14]. The actual procedures performed are determined by factors such as the setting of the practice and actual patient turnout[15]. Such an individual can be trusted with a non-invasive, [12] non-discomfiting[12], examination of the oral mucosa if directed on what exactly to examine for.

The oral cancer screening examination procedure has specific, distinct stages whose rationale can be explained to the therapists, and who can then perform such an examination immediately before or after prophylactic treatment, on any patient at risk. They can also incorporate important information regarding prevention of oral cancer, as related to tobacco, alcohol or fruit and vegetable consumption into their oral health education routines, helping to eliminate misconceptions about actual risk factors for oral cancer and illusions about the subject matter. This is especially important in rural or suburban localities where a dentist may not be available. Therapists are thus, well placed to serve as a 'spare' pair of eyes for the dentist, and their use in oral cancer preventive strategies can help alleviate the critical shortage in manpower of dental health professionals in developing countries such as Nigeria. Enlisting their help towards curbing late presentation of oral cancer would be more effective than saddling dentists alone with that huge responsibility.

The predominance of male therapists in this study (55.8%) is at variance with other reports about ancillary health professionals, where females predominate[14, 16 18]. [16], [17], [18] It maybe due to the data collection method, as there is a greater likelihood, in a male-dominated society like Nigeria, of men travelling across state lines for conferences than women. It may, however, just reflect a greater proportion of male dental therapists in the country, as, amongst the 12 therapists sampled from the ART training in Kano - a state in the Northwestern zone of the country, where only two were women. The situation in most other states or regions may be similar, explaining the greater preponderance of males in this study.

This present study showed that dental therapists are relatively familiar with the signs, symptoms and risk factors of oral cancer, even though they were more conversant with what DID NOT constitute a risk factor than what constitute a risk factor. When compared to similar studies[14, 16] on the subject, for example a study by Nicotera et al[17] where only 34.9% of the respondents identified 'use of alcohol' and only 14.4% mentioned 'Old age' as risk factors of oral cancer, the respondents in this study shouted acceptable knowledge of risk factors. Their scores were similar to those in the study of Symeet al[2] on the subject, where over 60% of a population of dental hygienists studied in Maryland, USA, identified older age, and even more identified alcohol as risk factors for oral cancer.

The respondents in this study showed very limited knowledge of the diagnostic procedures of oral cancer, buttressed by the low number who had adequate scores on the knowledge of diagnostic procedures scale (28 subjects [26.9%]). In contrast to the same study of Syme et al, where 53.3% of the hygienists identified the floor of the mouth as the most common site of oral cancer, only 27.9% of this study participants stated the same. This result is more similar to the study of Nicotera et al in this regard, where only 13.5% of the study respondents correctly answered that question.

This observation cannot be explained by random variation, and is probably an indicator of the scope of practice and training of our dental therapists, which traditionally does not include inspection or examination of the mucosa. Also, in our environment, patients who have advanced stage of oral cancer would preferentially present to traditional healers[11], Dentists and Physicians before Therapists. Dental therapists may therefore not appreciate the clinical stages of oral cancer. This is a gap that must be addressed before their services can be utilized in the oral cancer preventive efforts.

Adequate consumption of fruits and vegetables constitutes one of the most current protective strategies against development of oral cancer following studies by Winn[19] and Lawal et al[20] on the role of nutrition in the development of cancer and oral cancer in particular. In our study, 'Low consumption of fruits and vegetables' was the least correctly identified of the risk factors, despite it being an easily modifiable, dietary habit by patients of all economic or educational strata. This message is important, and should be included in regular undergraduate teachings on oral cancer. It would also have to be stressed in any continuing education curriculum about oral cancer for therapists being recruited into any prevention strategies. More information is expedient; as, overall, only 21.2% of the subjects had overall adequate knowledge about oral cancer. It will also be well received, because when given the opportunity to rank their perceived overall knowledge of oral cancer, most indicated they had insufficient knowledge on oral cancer, all respondents requested more information on the subject.

Conclusion

Practicing dental therapists constitute an obviously usable cadre of dental ancillary staff that can be employed in preventing and detecting oral cancer early, due to their closeness to the community and scope of clinical practice. They display gaps in knowledge, however, and need to be aggressively exposed to training that will improve their understanding of the signs and symptoms, risk factors and diagnostic procedures of oral cancer, if they are to contribute significantly to efforts to arrest the growing menace of oral cancer in Nigeria.

References

1. Health Workforce Australia 2011. Scope of Practice Review - Oral Health Practitioners. ISBN 978-0-9871920-7-3. Http://www.hwa.gov.au
2. Syme SE, Drury TF, Horowitz AM. Maryland dental hygienists' knowledge and opinions of oral cancer risk factors and diagnostic procedures. Oral Dis 2001; 7:177-184.
3. Mashberg A, Barsa P. Screening for oral and oropharyngeal squamous carcinoma. CA Cancer J Clin 1984; 34: 5.
4. Mittal S, Mahuli A, Hiregoudar M, Ramanarayanan S, Mohandas U, Manjunath PG, Natraj CG. Knowledge of oral cancer and screening practice of B.Sc. nursing students in Davangere City, India. J Educ Ethics Dent 2013; 3: 40-43.
5. American Association of Oral and Maxillofacial Surgeons. Oral cancer facts. Available at: http://www.aaoms.org/docs/media/oralcancerfacts.pdfRetrieved 15th March2014.
6. Ferlay J, Bray F, Pisani P, Parkin DM. GLOBOCAN 2002: Cancer Incidence, Mortality and Prevalence Worldwide IARC Cancer Base No. 5. version 2.0. Lyon: IARC Press; 2004.
7. Petti S, Scully C. Oral cancer knowledge and awareness: primary and secondary effects of an information leaflet. J Oral Oncol. 2007; 43: 408-415
8. Smith RA, Cokkinides V, Eyre HJ. American cancer society guidelines for the early detection of cancer, 2003. Cancer J Clin 2003; 53:27-43.
9. Lawal AO, Kolude B, Adeyemi BF, Lawoyin JO, Akang EE. Serum antioxidant vitamins and the risk of oral cancer in patients seen at a tertiary institution in Nigeria. Nig J Clin Pract 2012; 15:30-33.
10. Satur J, Gussy M, Marino R, Martini T. Patterns of Dental therapists scope of practice and employment in Victoria, Australia. J Dent Educ 2009; 3: 416-425.
11. Adebola RA, Bamgbose BO, Adeoye JB, Amole TG. Awareness of oral cancer in a Northwestern Nigerian State: Assessing the knowledge, opinion, and practice of traditional healers and herbalists. J Oral Oncol 2013, Article ID 263150, http://dx.doi.org/10.1155/2013/263150. Retrieved March 10 2014.
12. Yellowitz JA, Horowitz MA, Drury TF, Goodman HS. Survey of US dentists' knowledge and opinions about oral pharyngeal cancer. J Am Dent Ass 131: 653-661.
13. Meskin LH. One more time (editorial). J Am Dent Ass 1999; 130: 910-918.
14. Danfillo IS. Oral Health challenges for Sub- Saharan Africa. Nig Med J 2009; 50: 90-94. 15. Http://www.ada.org.au/dentalprofessionals/therapist.aspx.

15. Assessment of dental therapists. http://www.ada.org.au/dentalprofessionals/therapists.aspx
16. Monteiro LS, Salazar F, Pacheco J, Warnakulasuriya S. Oral cancer awareness and knowledge in the city of Valongo, Portugal. Int J Dent 2012, Article ID 376838, doi: 10.1155/2012/376838. Retrieved 8 March 2014.
17. Nicotera G, Gnisci F, Bianco A, Angelillo IF. Dental hygienists and oral cancer prevention: knowledge, attitudes and behaviors in Italy. Oral Oncol 2004; 40: 638-644.
18. Lo´pez-Jornet P, Camacho-Alonso F, Molina MF. Knowledge and attitude towards risk factors in oral cancer held by dental hygienists in the autonomous community of Murcia (Spain): A pilot study. Oral Oncol 2007; 43:602-606.
19. Winn DM. Diet and nutrition in the etiology of oral cancer. Am J Clin Nutr 1995; 61: 437-445.
20. Lawal A, Kolude B, Adeyemi BF, Lawoyin J, Akang E. Social profile and habits of oral cancer patients in Ibadan. Afr J Med Med Sci 2011; 40: 247-251