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Knowledge, attitude and eye care practices of dental professionals in a tertiary hospital in Kano, Nigeria

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Abstract

Background: Dental professionals are at high risk for eye injuries and eyestrain due to the nature of their work.
Aims: This study aimed to evaluate the knowledge, attitudes, and practices of eye care among dental professionals in Aminu Kano Teaching Hospital (AKTH), Kano, Nigeria.
Methods: A cross-sectional survey was conducted among 102 dental professionals at AKTH. A Simple random sampling technique using the one-time balloting system was used in selecting participants for this study. A self-administered questionnaire was used to collect data on participants' demographics, eye health knowledge, attitudes, and practices. Data collected was analysed using the Statistical Package for Social Sciences version 25 (SPSS version 22).
Results: The mean age of participants was 34.0 ± 7.5 years with a sex distribution of 3:2 male to female ratio. The majority were dentists (63.7%). Forty percent of participants use prescribed spectacles. The most common eye conditions reported were myopia (29.3%) and astigmatism (21.9%). Overall, participants had poor knowledge of eyecare. About 45.1% knew that eye check-ups should be done annually, and same proportion had heard of refractive surgery. Professional cadre and spectacles-use were the only demographic factors associated with eye care knowledge. The majority of participants (81.4%) had a positive attitude towards eyecare, but only 10.8% used vision enhancers (ocular loupes and binoculars/magnifiers). The most common reasons for not using vision enhancers were lack of provision by their employers (56%) and non-availability (15.4%).
Conclusion: Dental professionals in this study exhibited limited knowledge of eyecare, positive attitude towards eyecare but low utilization of vision enhancers that are important for increased workplace efficiency and safety. It is imperative to ensure that dental professionals adopt best practices to prevent workplace hazards.

Keywords: *Dental professionals, Occupational health, Eye health, Vision, Nigeria, Eye care education*

Introduction

Maintaining good vision is crucial for dental professionals as it enables them to work with precision in intricate oral structures, ensuring clinical accuracy and the necessary coordination between their eyes and hands.[1] This precision is essential for performing delicate procedures and creating highly aesthetic, lifelike dental prostheses. Beyond being a vital tool of their trade, a dental professional's eyes also play a significant role in their overall quality of life.[2]

The dental workplace, encompassing both the dental clinic and laboratory, can pose a high-risk environment for eye injuries.[3] Dental procedures

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often entail the use of high-speed instruments that generate aerosols, splatter, and the potential for contact with blood or other bodily fluids. These activities produce droplets that can directly endanger the eyes, potentially exposing dental professionals to blood borne infectious pathogens like HIV, hepatitis B, and hepatitis C.[4] Furthermore, there is a risk of small debris, dental materials, chemicals, or instruments accidentally dislodging during procedures, becoming airborne hazards. In the absence of proper eye protection, these particles can enter the eyes, leading to various issues such as irritation, corneal abrasions, or even more severe penetrating injuries.[3,4]

Dental professionals often work in positions that require them to lean over patients for extended periods, potentially leading to neck and back strain, eyestrain and discomfort.[5] Their procedures also involve performing close-up, intricate work within the oral cavity, which requires continuous use of near vision which further heightens the risk for eye strain, fatigue, and discomfort, commonly associated with tasks that demand close-up focus. Moreover, exposure to high-intensity light sources such as those from dental curing lights, can cause temporary visual discomfort and potential retinal damage.6 Furthermore, the demanding nature of dental work, including the need for precision and attention to detail, can be mentally and physically exhausting. Elevated levels of stress and fatigue can exacerbate eye strain and discomfort in these professionals.[7]

To mitigate the direct and indirect challenges dental practice pose to eye health, Optometrists recommend the use of protective eyewear, such as safety glasses, face shields, or goggles, to shield the eyes from splashes, debris, and chemicals.[3] They also advise on adherence to strict infection control protocols to minimize the risk of exposure to bloodborne pathogens and other infectious agents, as well as the need to ensure adequate lighting and implementing ergonomic practices, including taking regular breaks, and maintaining a comfortable working posture to reduce physical and visual stress[3,4,6]. Importantly, annual and biannual routine eye examinations for at-risk individuals and from the age of 40 for others, to detect and address any vision issues promptly.[8]

Aminu Kano Teaching Hospital (AKTH) in Kano serves as the primary tertiary healthcare institution not only for Kano state but also for neighbouring states.[9] The dental workforce at AKTH is diverse and includes Dental Surgeons, Dental Therapists, Dental Technologists, and Dental Technicians. Each of these professions has its unique curriculum, training duration, and specific requirements.

The aim of the study was to evaluate the knowledge, attitude and practice level of dental professionals in AKTH, Kano. It is hoped that the findings that can assist stakeholders in appreciating the baseline eye health knowledge, attitude and practices of dental professionals and provide insights for interventions to mitigate workplace hazards related to eye health while maintaining or enhancing their vision.

Methods

This study employed a cross-sectional design to evaluate the knowledge, attitude and practices of eye care among dental professionals in Aminu Kano Teaching Hospital (AKTH), Kano state. Data collection took place from May to July 2023.

A specially designed questionnaire, adapted from a previous similar study, was utilized for data collection.[6] The questionnaire comprised two sections: the first section gathered demographic information, including age, ethnicity, professional cadre, eyeglass use, and the duration of use. The second section contained questions related to participants' knowledge, attitudes, and practices regarding eye health.

All dental professionals at AKTH were approached and asked to complete a pre-tested questionnaire after indicating their intent by signing the informed consent form. A total of 102 participants gave consent and completely filled the questionnaires. Assistance was provided when necessary to aid in completing the questionnaire. Data were entered into Microsoft Excel and analysed with the Statistical Package for Social Sciences (SPSS) version 22. Descriptive statistics were used to summarize participants' characteristics and responses, which were then represented in tables and charts.

To assess knowledge, attitude, and practice scores, correct responses were assigned a score of +1, while incorrect responses received a score of 0. Subsequently, these scores were calculated and categorized as "poor" = 0, "fair" = 1 and "good" = 2.

Total scores of ≥2 was considered as positive attitude whereas scores < 2 were categorized as negative attitudes.

Bivariate and regression analyses were performed to identify factors associated with knowledge, attitudes, and practices. All tests of significance were carried out at a p-value threshold of ≤ 0.05.

Ethical Considerations

The study was conducted in accordance with the Declaration of Helsinki and the Nigerian National Code for Health Research Ethics. Approval was obtained from the Health Research Ethics Committee, Aminu Kano Teaching Hospital, Kano, Nigeria with reference numbers NHREC/28/01/2020/AKTH/EC/3515.

Results

In the study, a total of 102 dental professionals participated, ranging in age from 20 to 52 years. More than half of the participants did not use spectacles while the majority of users had used them for over 2 years.

Table 1. Social and eye-health demographics of study participants (n = 102)

Variables	Frequency, n	Percentage, %
Age groupa (years)		
20 – 29	28	28.6
30 – 39	49	50.0
≥ 40	21	21.4
Professional cadre		
Dentist	65	63.7
Technicians	18	17.7
Therapist	10	9.8
Technologist	9	8.8
Tribeb		
Hausa	40	43.0
Fulani	11	11.8
Yoruba	11	11.8
Igbo	8	8.6
Kanuri	4	4.3
Ebira	3	3.2
Otherse	16	17.2
Spectacle wearers		
No	61	59.8
Yes	41	40.2
Eye condition (n = 41)		
Myopia	12	29.3
Astigmatism	9	21.9
Presbyopia	4	9.8
Hyperopia	3	7.3
Myopic astigmatism	2	4.9
Don't know	11	26.8
Type of lens used (n = 41)		
Spectacles	34	82.9
Contact lens	3	7.3
Both	4	9.8
Duration of use (years) (n = 41)		
≤ 2	10	24.4
2+ to 5	11	26.8
5+ to 10	13	31.7
> 10	7	17.1

[a]Four participants with incomplete data [b]Nine participants with incomplete data [c]Babur, Bolewa, Idoma, Etsako, Shuwa, Tangale etc.

According to Table 2, spectacles-users were on average, five years older than those who did not (95% CI: 2.3 - 8.0 years, t = 3.56, p = 0.001), and the proportion of wearers increased with age.

The level of knowledge and attitude of participants on eye-care recommendations are shown in Table 3.

The relationship between the participants' knowledge level and demographic variables are given in Table 4.

According to Table 5, Dentists and spectacle wearers are more likely to have good knowledge of eye-care than their peers. Specifically, the odds of having good eye care knowledge are 13.9 and 2.9 times higher for dentists and spectacle wearers respectively.

Table 2. Association between spectacles-use, professional cadre and age

Variables	n	Non-Spectacles use	Spectacles use	P-value
Cadre				
Dentist	65	38 (58.5)	27 (41.5)	0.29
Technician	18	10 (55.6)	8 (44.4)	
Therapist	10	5 (50.0)	5 (50.0)	
Technologist	9	8 (88.9)	1 (11.1)	
Age (years)				
Range	20-49	22-52		
Mean ± SD	98	31.9 ± 5.8	37.1 ± 8.5	0.001*
20 – 29	28	21 (75.0)	7 (25.0)	
30 – 39	49	33 (67.3)	16 (32.6)	
> 40	21	4 (19.0)	17 (81.0)	

Values are n (%) except otherwise stated
*P-value calculated using Chi-square and Independent t-test, is significant if ≤ 0.05

Table 3. Participants' responses on knowledge of, and attitude to eye-care recommendations

Variables	Categories	Frequency	Percentage
Eye-care knowledge			
Recommended time for	Not aware	42	41.2
eye check-up	Annually	46	45.1
	Every 2 years	12	11.8
	> 2 years	2	1.9
Indications for refractive	No	56	54.9
surgery?	Yes	46	45.1
Overall knowledge score	Poor	26	25.5
	Fair	48	47.1
	Good	28	27.4
Eye-care practices			
Time since last eye exam	Never had	3	2.9
	1 year	53	52.5
	2 – 3 years	24	23.8
	4 – 5 years	8	7.9
	> 5 years	13	12.9
Eye exams are	No	9	8.8
mandatory	Not sure	7	6.9
	Yes	86	84.3
CS* treatment will	No	25	24.5
improve vision	Not sure	1	1.0
	Yes	76	74.5
Overall attitude score	Not positive	19	18.6
	Positive	83	81.4

CS* Contrast sensitivity

Table 4: Association between eyecare knowledge and demographics of dental professionals

	N	Knowledge of eye-care			P-value
		Poor	Fair	Good	
Cadre					
Dentist	65	12(18.5)	26(40.0)	27(41.5)	0.002
Technician	18	7(38.8)	10(55.6)	1(5.6)	
Therapist	10	5(50.0)	5(50.0)	0	
Technologist	9	2(22.2)	7(77.8)	0	
Age group (years)					
20 – 39	28	12(42.9)	11(39.3)	5 (17.9)	0.11
30 39	49	8(16.3)	25(51.0)	16 (32.6)	
≥ 40	21	4(19.0)	11(52.4)	6 (28.6)	
Spectacle wearers					
No	61	21(34.4)	28(45.9)	12 (19.7)	0.02
Yes	41	5(12.2)	20(48.8)	16 (39.0)	

P-value calculated using Chi-square and Fisher's exact tests

Table 5: Multivariate logistics regression of factors associated with good eyecare knowledge among dental professionals

Factors	Adjusted OR	95% CI	P-value
Cadre			
Technicians (ref.)	1.0		
Dentist	13.9	1.69, 114.1	0.01
Therapist			
Technologist			
Spectacle wearers			
No (ref.)	1.0		
Yes	2.9	1.08, 8.0	0.03

Adjusted odds ratio (OR) estimated using multivariate binary logistic regression
ref.: Reference category, CI: Confidence Interval
Outcome variable was dichotomized into poor/fair vs good knowledge.

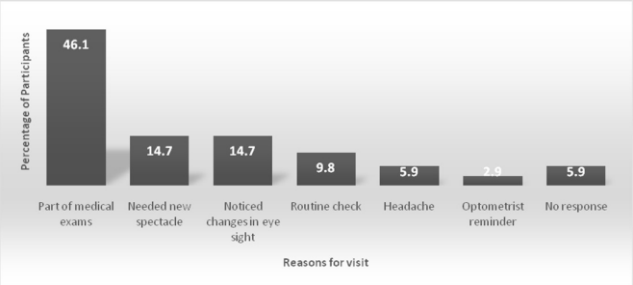

Figure 1: Reasons for undertaking an eye examination

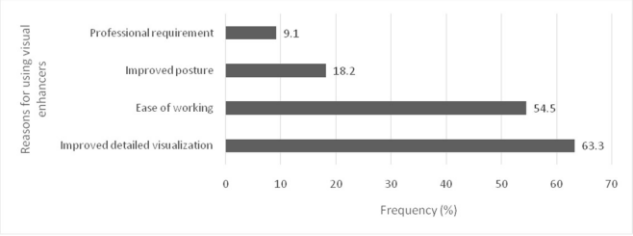

Figure 2: Reasons for using vision enhancers

Table 6: Utilization of other vision-enhancers (ocular loupes and binoculars/magnifiers)among dental practitioners

	Use of Vision-enhancers			
	N (n 102)	No (n 91)	Yes (n 11)	P-value
Cadre				
Dentist	65	60(92.3)	5 (7.7)	0.43
DST	18	16(88.9)	2 (11.1)	
Therapist	10	8(80.0)	2 (20.0)	
Technologist	9	7(77.8)	2 (22.2)	
Age group (years)				
20 39	28	25(89.3)	3 (10.7)	0.88
30 – 39	49	44(89.8)	5 (10.2)	
> 40	21	18(85.7)	3 (14.3)	
Spectacle wearers				
No	61	57(93.4)	4 (6.6)	0.09
Yes	41	34(82.9)	7 (17.1)	

P-value calculated using Chi-square and Fisher's exact tests

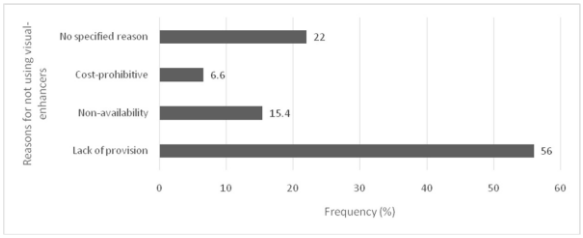

Figure 3: Reasons for not using vision enhancers (n=102)

The distribution of participants who made use of vision-enhancers is given in Table 6.
Participants' reasons for using vision-enhancers are given in Figure 2. (n=102)
Participants' reasons for not using vision-enhancers are given in Figure 3.

Discussion

Findings from this study shows that 47% of the participants have a fair knowledge on eye care practices with respect to workplace ergonomic demand even though a higher percentage of participants did not know the recommended time for eye examination. In this study, it is apparent that a higher percentage of dental professionals exhibited a lack of awareness regarding their own eye conditions compared to a similar study conducted in a more developed country.[10] While this may reflect the level of knowledge among the study participants, it also highlights the access-to-care challenges prevalent in developing countries. In such regions, healthcare can be costly and individuals often seek medical attention only when symptoms become apparent. However, professional

cadre of the participants and spectacle wearers show significant association with knowledge of eye care. Dentist (AOR = 13.9, 95 % CI; 1.69–114.1) and Spectacle wearers (AOR = 2.9, 95 % CI; 1.08–8.0) had significant association with knowledge of eyecare. From the current study, factors such as professional cadre, the use of spectacles, and old age were linked to a higher level of knowledge and awareness regarding standard eyecare recommendations. The comparative rigorous academic requirements for qualifying as dentists, may explain their advantage in this study.[1,11] In the same vein, individuals who wear spectacles often have firsthand symptoms that necessitated them seeking accurate information from eye care professionals.[12] Furthermore, since advanced age is frequently associated with various health challenges, including eye-related issues, which can contribute to an improved understanding of eyecare practices as these individuals seek relief from their conditions.[12]

Also, 83% of the study participants had positive attitude towards eye care and spectacle wear which is higher than a study in the general population.[13] This difference might be due to the setting of these participants as healthcare workers, including dental professionals, are expected to possess a high level of knowledge on health-related matters due to their foundational training, their attitudes and practices can be influenced by a multitude of factors. These factors include the demands of high-pressure work environments (such as those found in public hospital settings), gaps in education and training, overconfidence in their abilities and a lack of accountability, among others.[12] In the period of this study, 40% of the participants use spectacles that were prescribed by eye care professional and all had their eyes tested before obtaining the spectacles.

Furthermore, the participants demonstrated good eye care practice and the proportion of prescription-glasses wearers in this study is higher than the population average of about 1.2%.[14] This disparity may indeed reflect the heightened preventive practices of health workers compared to the general population. It also underscores the unique impact of the dental profession on the practitioners, where clear and accurate vision is not only essential for personal well-being but also crucial for ensuring the effectiveness, safety, and quality of care they provide to their patients. Dental Therapists in this study had the highest proportion of spectacle wearers. While several factors such as the intense visual demands of their practice, continuous exposure to particular lighting conditions, and the effects of aging may offer explanations for this observation, it's essential to recognize that these conditions are not unique to Dental Therapists alone. Drawing broader conclusions from this observation would require a more comprehensive research effort, into the personal and occupational risk factors of the different cadres. The wide range of eyeglass usage durations observed in this study highlights that some participants have relied on vision-enhancers for many years. This raises questions about the sustainability and long-term effectiveness of their chosen eyecare solutions. Regular check-ups with qualified eye care specialists can provide individuals with opportunities to explore both surgical and non-surgical eyecare alternatives, including refractive surgery and the use of contact-lens which offer freedom from eyewear, cosmetic benefits and better comforts.[15]

The consistent finding of age-related patterns in the use of spectacles in this study emphasizes the critical importance of routine eye check-ups and vision assessments, particularly as dental professionals age.[16,17] The average age of the study participants and the prevalence of spectacle usage in this study align with the observations made by the American Optometrists' Association (AOA). According to the AOA, eye-related deteriorations tend to become more common around the age of 40, which is part of the natural aging process and often necessitates the use of corrective lenses.[8] To preserve or improve the eye health of senior citizens, it is imperative to carry out targeted educational interventions, improved accessibility to vision screenings, and the promotion of preventive eyecare practices through mass and social media campaigns in the dental workplaces and professional conferences. Furthermore, dental professionals have a professional responsibility to maintain their health and ensure that they can provide the best possible care to their patients, which includes addressing any vision issues promptly.

Conclusion

The study findings suggest that Dental Practitioners in this setting had good knowledge, positive attitude towards eye care safety. However, most of the dental practitioners did not use vision enhancers because they were not provided in the workplace.

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