

Association Between Oral Health Literacy and Dental Anxiety among Dental Outpatients

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Objective: To examine the association between oral health literacy and dental anxiety among dental outpatients.

Methods: This study was part of a larger oral health literacy cross-sectional study was conducted among patients attending outpatient dental clinic of University of Benin Teaching Hospital Benin City. Data of interest were demographic characteristics, oral health literacy assessed using Rapid Estimate of Adult Literacy in Dentistry-30 (REALD-30), and dental anxiety assessed using Modified Dental Anxiety Scale (MDAS).

Results: A total of 208 patients comprising male 130 (62.5%) and females 78 (37.5%) aged 16 to 60 years with mean age of 26.84 ± 9.16 years formed the study population. The mean oral health literacy score and dental anxiety score was 22.44 ± 6.94 (range 0-30) and 10.62 ± 4.25 (range 0-25). The prevalence of dental anxiety was 35.6%. Oral health literacy was negatively correlated with dental anxiety ($r = -0.045$, $P = 0.522$).

Conclusion: About one in every third patient in this study reported dental anxiety which was negatively correlated with oral health literacy. A boost in oral health literacy level will serve as dental anxiety reduction protocol.

Keywords: Dental anxiety, dental outpatient, oral health literacy,

INTRODUCTION

Health literacy is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (Sorensen et al., 2012). When the basic health information and services are related to oral health, it is considered oral health literacy. Health literacy is one of the determinants of health, illness recovery and health-related quality of life enhancement in individuals and will necessarily acts as an instrument to address health inequalities (Davis & Wolf, 2004; Rowlands et al., 2017; Horowitz & Kleinman, 2012).

Individuals without the health literacy skills to make sound health decisions in their everyday lives, are more vulnerable and have poorer health outcomes. Low health literacy constitutes one of the main barriers to the adoption healthy practices and control of preventable diseases. It is associated with poor health knowledge, unhealthy behaviours, low usage of preventive services, poor

health status, high hospitalization rates and higher mortality (Berkman et al., 2011). An increase in health literacy has been stated to have the potential to promote better decisions based on information, reduce health risks, increase well-being and transit through health systems, improve patient safety, patient care and quality of life (Kickbusch et al., 2006).

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Low level of oral health literacy interferes with their ability to process, understand and use oral health information (Jones et al., 2007). Patients with low health literacy may have trouble with provider-patient communication which may trigger or heighten anxiety (Lee et al., 2011). This anxiety as it relates to dental setting is dental anxiety. These findings indicate that patients with

negative oral health beliefs are more prone to be diagnosed with dental anxiety

Dental anxiety is a phenomenon that negatively affect delivery and receipt of oral health services on a daily basis, worldwide (Pohjola et al., 2007). It can be stated that the dental anxiety very common among patients with about one out five to eight individuals in Nigeria predominantly women report dental anxiety that may be problematic (Azodo & Umoh, 2016). Dental anxiety exerts a detrimental effect on dental health. It is related to poor oral health, poorer oral function and a higher frequency of oral diseases (Elter et al., 1997; Bell et al., 2012). There are longer intervals between dental visits for dentally anxious people and they are less frequent and irregular dental clinic visitors (Quteish Taani, 2002). The common detrimental effect of low health literacy and dental anxiety on oral health deserves a critical look if oral health literacy and dental anxiety have any relationship. Unfortunately, no previous studies assessed relationship between oral health literacy level and dental anxiety among the Nigerian population. The objective of this study was to examine the relationship of dental anxiety and oral health literacy among dental outpatients.

MATERIALS AND METHODS

This study was a part of a bigger oral health literacy cross-sectional study conducted among dental patients attending University of Benin Teaching Hospital, Benin-City, Nigeria between May and July, 2017. Systematic sampling technique was used to recruit 208 patients which exceeded the minimum sample size calculated using Cochran's formula for epidemiological studies. $n = z^2 p (1-P) / d^2 = 137$. Where n = sample size, z = statistics for a level of confidence (set at 1.96 corresponding to 95.0% confidence level), p = prevalence = 89.7%, being the prevalence of adult literacy in English Language in Edo State, Nigeria (National Bureau of Statistics, 2010), $q = 1-P$ and d = degree of accuracy desired (error margin) = 5% (0.05). Consenting dental patients aged 16-60 years were included while non consenting patients were excluded. The data collection tool was an interviewer-administered questionnaire and main variables of interest were dental anxiety assessed with Modified Dental Anxiety Scale (MDAS) and oral health literacy assessed with Rapid Estimate of Adult Literacy in Dentistry-30 (REALD-30). REALD-30 consists of 30 words related to dentistry that range from easy-to-read words such as "sugar," "smoking," and "floss" to very difficult words such as "hypoplasia," "apicoectomy," and "temporo-mandibular." It is a reliable and valid oral

health literacy instrument, designed to be read aloud by participants to the interviewer. For scoring, one point was assigned for each word pronounced correctly and summed up to get the overall score. The minimum score is 0 while the maximum is 30. The higher the scores indicated, the higher the oral health literacy while the lower the scores indicated, the lower the oral health literacy. The oral health literacy was therefore categorized as low when the score was less than or equal to 22.44 and high when it was greater than ≥ 22.44 .

The MDAS which had 5 questions and each question had a 5-category rating scale ranging from 'not anxious' to 'extremely anxious'. MDAS is the Corah's Dental Scale with addition of an extra item about the participant's anxiety to a local anaesthetic injection. This means that the minimum score of 5 and maximum score of 25 can be obtained. The higher score indicates higher dental anxiety while lower score indicates lower dental anxiety. MDAS have sensitivity of 0.8, specificity of 0.85, good internal consistency and concurrent validity coefficient (Coker et al., 2012). Coker et al. (2012) set the cut off for dental anxiety at score 11 and concluded that MDAS is a useful instrument for measuring dental anxiety among Nigerians because of its reliability, validity, brevity and ease of administration. Informed consent was obtained from the participants and ethical approval obtained from the Ethics and Research Committee of University of Benin Teaching Hospital Benin City. Data obtained was subjected descriptive, Chi-square and Pearson's correlation statistics using IBM SPSS version 21.0 and P-value was set at 0.05 for significance level. The income earning status was categorized based on basic earning power of occupations in Nigeria into low [(students, labourers and traders) earning 50,000naira or less per month] medium [(civil servants, teachers, businessmen/women) earning 51,000 to 100,000naira per month] and High (professional like lawyers, engineers, accountants etc) earning more than 100,000naira per month].

RESULTS

The majority of the participants were 21-60 years old (50.5%), males (62.5%), single (73.1%), low income earners. less than half (41.3%) fell into the low oral literacy group (Table 1). The highest mean for component of MDAS was Local anaesthetic injection which was 2.71 ± 0.08 and overall mean MDAS was 10.62 ± 0.29 (Table 2). A total of 74 participants reported dental anxiety giving a prevalence of 35.6%. Participants aged 25-60years (33.3%) reported the lesser dental anxiety.

Female (37.2%) reported more dental anxiety score than males (34.6%). Participants with low oral health literacy (39.5%) reported higher dental anxiety score than participants with high oral health literacy (32.8%) (Table 3). Correlation statistics

revealed oral health literacy was negatively correlated ($r=0.0.45$) with dental anxiety and this correlation was not statistically significant ($P=0.522$).

Table 1: Demographic Characteristics of the participants

Characteristics	Frequency (n)	Percent (%)
Age (years)		
16-24	103	49.5
25-60	105	50.5
Gender		
Male	130	62.5
Female	78	37.5
Marital status		
Single	152	73.1
Married	56	26.9
Income earning status		
Low	152	73.1
Medium/High	56	26.9
Oral health literacy		
Low	86	41.3
High	122	58.7
Total	208	100.0

Table 2: Mean of MDAS among the participants

	Check up	Waiting	Dentist chair	SnP	LA injection	MDAS
Mean	2.07	1.84	1.95	2.05	2.71	10.6202
Std. Error of Mean	.089	.074	.077	.074	.080	.29445

DISCUSSION

Health literacy may improve knowledge and skill of the members of the society and it is important to detect patients with inadequate oral health literacy (OHL) and to improve the level of communication between the provider and the patient. Low oral health literacy creates a substantial barrier to improving oral health (Horowitz & Kleinman, 2008). Effective communication with patients which is necessary to improve the overall oral health helps to reduce dental anxiety.

In this study, there existed no significant association between oral health literacy and dental anxiety. However, it was found that patients with low oral health literacy reported higher dental anxiety. This may be due to the fact that less understanding of issues more likely precipitates anxiety. For example, patients with low health literacy may be reluctant to ask health providers questions and are less likely to participate in making decisions about clinical treatment.

In this study, the prevalence is dental anxiety among dental patients was 35.6% using the 11 as MDAS cut off according to validation done in Nigeria. This is higher than (25.6%) reported among parents of children undergoing dental treatment in Brazil (Barasuo et al., 2017) but lower than the reported values (48.6%) with similar cut off in Lagos, Nigeria. The variations may be due to racial and ethnic differences in dental anxiety reportage and also that the studied adults came to dental setting as accompanying person and not as patients.

The component of MDAS that had the highest mean score was anticipation of local anaesthetic injection. This may be in turn with high level of fear of needle and needle phobia reported worldwide (Taddio et al., 2012). The old people had lower dental anxiety which be attributed to gained life experiences and cultural belief where older person are expected to shield their anxiety as a model to protect their younger ones (Armfield et al., 2006; Lahti et al., 2007; Yildirim et al 2016).

Table 3: Association between demographic characteristics and dental anxiety among the participants

Characteristics	No dental anxiety n (%)	Dental anxiety n (%)	P-value
Age (years)			0.495
16-24	64 (62.1)	39 (37.9)	
25-60	70 (66.7)	35 (33.3)	
Gender			0.679
Male	85 (65.4)	45 (34.6)	
Female	49 (62.8)	29 (37.2)	
Marital status			0.530
Single	96 (63.2)	56 (36.8)	
Married	38 (67.9)	18 (32.1)	
Income earning status			0.725
Low	99 (65.1)	53 (34.9)	
Medium/High	35 (62.5)	21 (37.5)	
Oral health literacy			0.317
Low	52 (60.5)	34 (39.5)	
High	82 (67.2)	40 (32.8)	
Total	134 (64.4)	74 (35.6)	

The higher reportage dental anxiety among the female participants is consistent with documented evidence in the literature (Thomson et al., 1997; Peretz & Moshonov, 1998; Stabholz & Peretz, 1999; Udoye et al., 2005; Marya et al., 2012; Bashiru & Omotola, 2016). This may be due to the fact that males are known to more emotionally stable than females and that emotions and other psychological conditions like social phobia, stress, depression, fear, and panic which are associated dental anxiety are more common in females (Moore et al., 1993; Doerr et al., 1998; Bergdahl & Bergdahl, 2003; Al-Omari & Al-Omiri, 2009; Arslan et al., 2011). Lower pain threshold with low tolerance for painful stimuli predispose to dental anxiety and these characteristics are found mores in females which may be contributory explanation for more dental anxiety among females (Ekanayake & Dharmawardena, 2003).

Singles had more dental anxiety than their married counter parts which is consistent with Egbor & Akpata (2014) report in Benin, Nigeria and this could be due to the supportive role of significant others in the family that helps with improvement in coping potentials.

Infrequent dental visits which is dominant among low income earners coupled with worries about the cost of restoring or maintaining oral health certainly could contribute to increased anxiety level (Doerr et al., 1998). Contrary to this, we found that low income earners reported less dental anxiety which differed with report of a previous study in Benin City, Nigeria (Egbor & Akpata, 2014).

CONCLUSION

About one in every third patient in this study reported dental anxiety which was negatively correlated with oral health literacy. A boost in oral health literacy level will serve as dental anxiety reduction protocol

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Conflict of interest

The authors declare that they have no conflicts of interest.

REFERENCES

- Al-Omari WM, Al-Omiri MK. Dental anxiety among university students and its correlation with their field of study. *J Appl Oral Sci* 2009; 7(3):199-203.
- Armfield JM, Spencer AJ, Stewart JF (2006). Dental fear in Australia: who's afraid of the dentist? *Aust Dent J*; 51(1):78-85.
- Arslan S, Erta E, Ülker M (2011). The relationship between dental fear and sociodemographic variables. *Erciyes Med J*; 33:295-300.

- Azodo CC, Umoh AO (2016). Perception of gingival bleeding and oral health practices in dental anxious and nonanxious Nigerian teachers. *J Interdiscip Dentistry*; 6:14-18.
- Barasuol JC, da Silva Assunção LR, Fraiz FC, Menezes JNVB (2017). Oral Health Literacy as a Predictor of Dental Anxiety in Parents of Children Undergoing Dental Treatment. *J Dent Child (Chic)*; 84(3):125-131.
- Bashiru BO, Omotola OE (2016). Prevalence and determinants of dental anxiety among adult population in Benin City, Nigeria. *Eur J Gen Dent*; 5:99-103.
- Bergdahl M, Bergdahl J (2003). Temperament and character personality dimensions in patients with dental anxiety. *Eur J Oral Sci*; 111(2):93-98.
- Bell RA, Arcury TA, Anderson AM, Chen H, Savoca MR, Gilbert GH, Quandt SA (2012). Dental anxiety and oral health outcomes among rural older adults. *J Public Health Dent*; 72(1):53-59.
- Berkman ND, Sheridan SL, Donahue KE, et al (2011). Health literacy interventions and outcomes: An updated systematic review. Rockville, MD.
- Coker AO, Sorunke ME, Onigbinde OO, Awotile AO, Ogunbanjo OB, Ogunbanjo VO (2012). The prevalence of dental anxiety and validation of the modified dental anxiety scale in a sample of Nigerian population. *Niger Med Pract*; 62:138-144.
- Doerr PA, Lang WP, Nyquist LV, Ronis DL (1998). Factors associated with dental anxiety. *J Am Dent Assoc*; 129(8):1111-1119.
- Davis TC, Wolf MS (2004). Health literacy: implications for family medicine. *Fam Med*; 36(8):595-598.
- Egbor PE, Akpata O (2014). An evaluation of the sociodemographic determinants of dental anxiety in patients scheduled for intra-alveolar extraction. *Libyan J Med*; 9:25433. doi: 10.3402/ljm.v9.25433.
- Ekanayake L, Dharmawardena D. Dental anxiety in patients seeking care at the University Dental Hospital in Sri Lanka. *Community Dent Health*. 2003; 10:112-116.
- Elter JR, Strauss RP, Beck JD (1997). Assessing dental anxiety, dental care use and oral status in older adults. *J Am Dent Assoc*; 128(5):591-597.
- Horowitz AM, Kleinman DV (2008). Oral health literacy: the new imperative to better oral health. *Dent Clin North Am*. 2008; 52(2):333-44.
- Horowitz AM, Kleinman DV (2012). Oral health literacy: a pathway to reducing oral health disparities in Maryland. *J Public Health Dent*; 72 Suppl 1:S26-30.
- Jones M, Lee JY, Rozier RG (2007). Oral health literacy among adult patients seeking dental care. *J Am Dent Assoc*; 138(9):1199-208; quiz 1266-7.
- Kickbusch I, Wait S, Magg D (2006). Navigating health. The role of health literacy. London: International Longevity Centre-UK.
- Lahti S, Vehkalahti MM, Nordblad A, Hausen H (2007). Dental fear among population aged 30 years and older in Finland. *Acta Odontol Scand*; 65(2):97-102.
- Lee JY, Divaris K, Baker AD, Rozier RG, Lee SY, Vann WF., Jr (2011). Oral health literacy levels among a low-income WIC population. *J Public Health Dent*; 71(2):152-160.
- Marya CM, Grover S, Jnaneshwar A, Pruthi N. Dental anxiety among patients visiting a dental institute in Faridabad, India. *West Indian Med J*. 2012 Mar; 61(2):187-90.
- Moore R, Birn H, Kirkegaard E, Brødsgaard I, Scheutz F (1993). Prevalence and characteristics of dental anxiety in Danish adults. *Comm Dent Oral Epidemiol*; 21(5):292-296.
- National Literacy Survey (2010). The report of the National Literacy Survey. <http://www.nigerianstat.gov.ng/pdfuploads/National%20Literacy%20Survey,%202010.pdf>. Accessed 10/10/2017.
- Peretz B, Moshonov J (1998). Dental anxiety among patients undergoing endodontic treatment. *J Endod*; 24(6):435-437.
- Pohjola V, Lahti S, Vehkalahti MM, Tolvanen M, Hausen H (2007). Association between dental fear and dental attendance among adults in Finland. *Acta Odontol Scand*; 65(4):224-230.
- Quteish Taani DS (2002). Dental anxiety and regularity of dental attendance in younger adults. *J Oral Rehabil*; 29(6):604-608.
- Rowlands G, Shaw A, Jaswal S, Smith S, Harpham T (2017). Health literacy and the social determinants of health: a qualitative model from adult learners. *Health Promot Int*; 32(1):130-138.
- Sorensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z et al (2012). Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*; 12:80 doi: 10.1186/1471-2458-12-80.
- Stabholz A, Peretz B (1999). Dental anxiety among patients prior to different dental treatments. *Int Dent J*; 49(2):90-94.

Taddio A, Ipp M, Thivakaran S, Jamal A, Parikh C, Smart S, Katz J (2012). Survey of the prevalence of immunization non-compliance due to needle fears in children and adults. *Vaccine*; 30(32): 4807-4812.

Thomson WM, Stewart JF, Carter KD, Spencer AJ (1996). Dental anxiety among Australians. *Int Dent J*; 46(4):320-324.

Udoye CI, Oginni AO, Oginni FO. Dental anxiety among patients undergoing various dental treatments in a Nigerian teaching hospital. *J Contemp Dent Pract*. 2005; 6(2):91-98.

Yildirim TT (2016). evaluating the relationship of dental fear with dental health status and awareness. *J Clin Diagn Res*; 10(7):ZC105-109.