Dental Phobia and Its Impact on the Quality of Life of a Ghanaian Adult Population

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Abstract

Aim: Dental phobia is a significant cause of avoidance of dental treatment, which could result in poor oral health. This study sought to determine the prevalence of dental phobia among a Ghanaian adult population and how this affects their quality of life.

Materials and Methods: The study was a cross-sectional survey conducted among 329 patients attending the University of Ghana Dental School Clinic. Dental phobia was assessed with the Kleinknecht's Dental Fear Survey (DFS), and Quality of Life measured with the Oral Health Impact Profile (OHIP). Data were analyzed using Stata 14 software and MS Excel. Descriptive statistics and measures of association between DFS and OHIP were done.

Results: About 46% of the study population had some level of dental phobia, with 8% having a high level of fear. More males (54.2%) were found to have experienced dental phobia than females (45.8%). Common causes of dental phobia were injection (54.7%), x-ray (24.9%), the dental clinic environment (13.4%), and the sound and feel of the handpiece (0.9%).

Conclusion: Dental phobia was common among the dental clinic attendants. While further research is required in the subject area, clinicians and stakeholders should not under-estimate its prevalence and potential effects.

Keywords: Dental Phobia, Anxiety, Quality of Health, Oral Health, Ghana.

Introduction

Dental phobia, the fear associated with dental procedures, environment, and personnel, is of considerable concern as it affects health-seeking behaviours and impedes oral healthcare delivery by dental professionals. It is one of the major causes of avoidance of treatment, which could lead to poor oral health[1]. Generally, phobia can be described as a persistent, unrealistic, and intense fear of a specific stimulus, leading to complete avoidance of the perceived danger, or source of danger. The Diagnostic and Statistical Manual of Mental Disorders DSM-V and the International Statistical Classification of Diseases and Related Health Problems (ICD)-10 classified dental phobia as an overwhelming and irrational fear of dentistry[2]. The fear, normally characterized by extreme feelings of hypertension, terror, trepidation, and unease is also termed "odontophobia"[3]. In many instances, dental fear causes patients to evade seeking treatment[4]. Anxiety, which is often interchanged with phobia or fear, refers to a feeling of worry, nervousness, or unease, and can therefore be described as a milder form of fear. Dental anxiety is not limited to individuals with unpleasant prior experience or those with little to non-dental knowledge. However, both terms are often used interchangeably in dental literature to refer to ill-feelings toward dental

treatment[5]. Some authors have suggested that the main difference between dental anxiety and fear is the intensity of emotions, with that of a phobic situation being much stronger[6].

Quality of life, defined as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns"[7], is inherently influenced by location and health outcomes, including oral health. The relationship between anxiety, patients' oral health, and their quality of health has been studied in other populations, being reported that the QoL of individuals might be linked to dental anxiety and oral health[8]. Other essential factors that influence the level of anxiety include age and gender of patients[9].

Despite several studies in this area, there is a dearth of information on the prevalence of dental anxiety and its association with oral health quality of life (OHQoL) in developing countries and how dental anxiety affects the OHQoL. There are very few studies done in Ghana investigating dental anxiety and phobia, and even fewer exploring the relationship between dental anxiety and the QoL of individuals. As health behaviours are known to be influenced by environmental factors[10], the unique belief system and cultural dynamics of the Ghanaian society could influence perceptions and the levels of dental phobia experienced by patients. Therefore, this study sought to ascertain the level of dental phobia and anxiety among patients with oral problems and determine how this affects their quality of life.

Materials and Methods

This study adopted a cross-sectional survey to determine the level of dental phobia on patients attending the University of Ghana Dental School Clinic (UGDSC) from January to March 2019. The UGDSC is a hospital-based dental clinic that attends to both walk-in and referred patients seeking routine and advanced care in general dentistry. Study participants were adult patients 18 years and above who were attending the clinic, and consented to be part of the study**.** Respondents meeting the inclusion criteria were consecutively selected daily. The chosen participants were met separately in a private area where the questionnaires were self-administered to them. Patients who were critically ill or had speech and language impairments were excluded from the study. The sample size (n) was calculated with the formula $n = z^2P(1-P)/d^2$, where z = z value (e.g. 1.96 for 95% confidence level); P = prevalence; and d = precision. Assuming a 7.43% prevalence of dental anxiety in a similar population[12], and a precision of 5%, the minimum sample size obtained was 100.

Dental fear and QoL were measured respectively with the Kleinknecht Dental Fear Survey (DFS) [13], and the oral health impact profile (OHIP-14) [14]. The OHIP-14 questionnaire is an abridged form of the OHIP-49, which obtains information on the frequency of functional limitations, pain, psychological unease/discomfort, physical impairment, mental impairment, social impairment, and disadvantage/ disability in the month before the interview. Each of the 14 items had five responses, and were coded as follows: 0 = never, 1= hardly ever, 2 = now and then, 3 = often, and 4 = very often. The OHIP-14 was assessed by summing the ordinal values of the individual responses, with higher scores indicating worse OHQoL. The DFS, composed of 20 items and using 5-point Likert scales, also measured three dimensions: avoidance of dental treatment, somatic symptoms of anxiety, and anxiety caused by the dental stimuli. The total DFS scores were obtained for each patient. Both questionnaires were culturally adapted, validated, and translated into three major Ghanaian languages (Akan, Ewe, and Ga), for patients who did not understand the English language. The range of DFS scores were divided into tertiles, with the tertiles being classified as 'none/mild', 'moderate fear', and 'high fear'. The range of OHIP-14 scores were similarly divided into tertiles, but with the highest scores categorized as 'unsatisfactory OHQoL', and recoded as a dichotomous variable (satisfactory/unsatisfactory).

Data analysis was done using Stata 14 software (StataCorp. College Station, TX) and Microsoft Excel 2016. Descriptive statistics were done to represent the prevalence of fear and the level of quality of life. The association between the two was then explored using cross-tabulations and simple linear regression analysis, assuming an alpha level of 0.05 at 95% confidence.

Ethical clearance was granted by the Ethical and Protocol Review Committee of the College of Health Sciences, University of Ghana (CPDD/011/06/2019). All participants were managed in accordance with the standard treatment guidelines of the facility.

Results

A total of 329 participants were included in this study. Ranging from 18 to 83 years, the mean age was 39.7 years (±15.9). Nearly half (45.0%) of the participants were young adults aged between 18-35 years, followed by middle-aged adults (38.9%) aged between 36-55 years, and older adults aged more than 56 years accounted for 16.1% of the population **(Table 1).** More than half (55.6%) of participants were males. Only 3.7% had no formal

education, with the remaining 96.3% completing various levels of education.

While 54% of the respondents did not

Table 1: Background characteristics of respondents

Variable	Frequency	Percentage (%)
Age (years)		
18-35 years	148	45.0
36-55 years	128	38.9
56+ years	53	16.1
Sex		
Male	183	55.6
Female	146	44.4
Religion		
Christianity	303	92.1
Islam	23	7.0
Others	3	0.9
Education		
No formal education	12	3.7
Primary/JHS	31	9.4
SHS/Vocational	57	17.3
Tertiary	229	69.6
Occupation		
Student	58	17.6
Unemployed	79	24.0
Employed in informal sector	54	16.4
Employed in formal sector	138	42.0

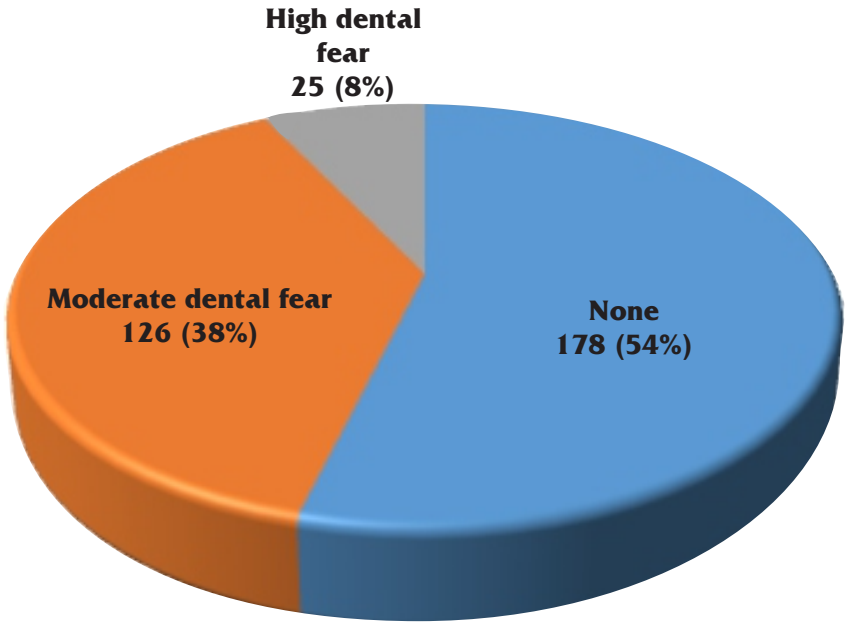

Fig. 1: Prevalence of Dental Fear

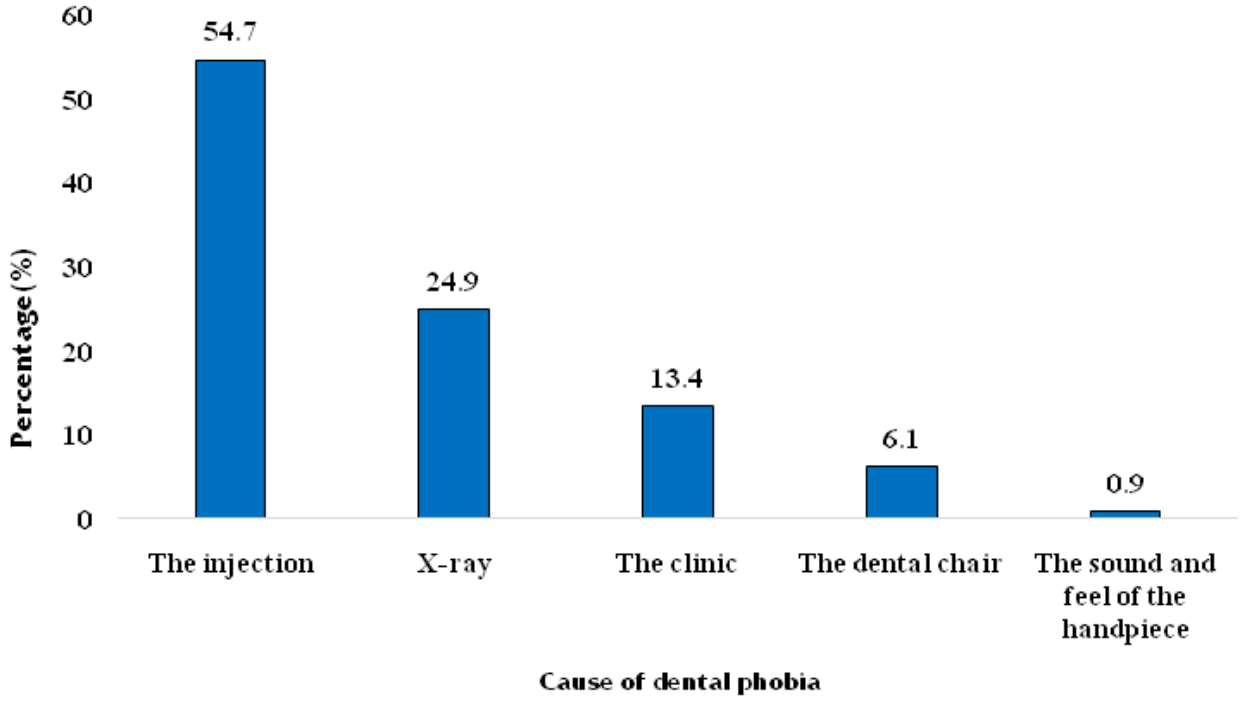

Fig. 2: Sources of dental phobia

indicate appreciable dental fear, 8% had a high level of fear, with 38% having a moderate level of fear **(Fig.1)**. Of the 151 respondents who had either moderate or high fear, 52.3% were males, and 47.3% females. The mean age among this sub-population was 38.6±13.5 years. However, the odds of females experiencing high dental phobia was 1.2 times that of males (P=0.297). Moderate or high fear was not significantly distributed among age (P=0.297), religion (P=0.254), education (P=0.153) or occupation (P=0.210).

The most common cause of dental phobia was injection (54.7%), followed by x-ray (24.9%) and the dental clinic environment (13.4). Others included the dental chair (6.1%) and the sound and feel of the handpiece (0.9%) **(Fig. 2)**.

Ranging from 0 to 56, the mean and median OHIP scores for the entire population were 35.8±13.7 and 37, respectively. This, however, varied among the different sub-populations. As shown in Table 2, young adults (18-35 years) had the worst OHQoL among the age categories. Females also had better OHQoL. The changes in these subgroups were however, not significant per our assumptions **(Table 2).** Participants with no formal education recorded the best OHQoL, likewise those with mild/no dental fear in their respective categories **(Table 2)**.

Table 2: OHIP scores by variables

Variable	OHIP-14 Scores				
	Mean	Median	Interquartile Range	Test	P-value
Age (years)				Kruskal-Wallis	0.816
18-35 years	36.8±12.4	37	46-28.5	test=0.406	
36-55 years	34.9±14.7	37	46-27		
56+ years	35.3±15.0	37	46-26		
Sex				Mann-Whitney	0.058
Male	37.0±13.7	40	47-29	test= 1.895	
Female	34.4±13.7	35.5	45-27		
Religion				Kruskal-Wallis	0.064
Christianity	35.3±13.9	37	46-27	test=5.495	
Islam	41.9±10.5	42	53-33		
Others	43.7±6.4	40	51-40		
Education				Kruskal-Wallis	0.011*
No formal education	19.3±18.5	17.5	33-2.5	test=11.039	
Primary/JHS	38.2±13.2	37	50-33		
SHS/Vocational	36.1±13.4	37	46-28		
Tertiary	36.3±13.1	38	46-28		
Occupation				Kruskal-Wallis	0.933
Student	36.4±12.9	37.5	46-28	test=0.434	
Unemployed	35.9±13.9	37	46-27		
Employed in informal sector	36.4±14.4	39	46-28		
Employed in formal sector	35.3±13.9	36	46-28		
Level of Dental Fear				Kruskal-Wallis	0.007*
None or mild fear	33.6±22.2	41	51-4	test=12.027	
Moderate fear	37.3±13.6	39.5	47.5-29		
High Dental fear	36.2±11.1	37	45-29		

*Statistically significant

Nearly half of the entire population (48.9%) had 'unsatisfactory' OHQoL. The odds of females having 'satisfactory' OHQoL was 1.45 times that of males (P=0.099). Similarly, participants exhibiting high fear, compared to those with no/mild fear, were more likely to have 'satisfactory' OHQoL (OR=2.94). Participants without formal education also had a 5.03 odds of having satisfactory OHQoL than those with formal education **(Table 3)**.

Table 3: Relationship between satisfactory OHQoL and variables

Variable	OR	SE	CI
Sex			
Male	Ref		
Female	1.45	0.32	0.93-2.23
Dental Fear			
No or mild fear	Ref		
Moderate fear	1.30	0.30	0.82-2.05
High fear*	2.94	1.38	1.17-7.39
Formal Education			
Educated	Ref		
Not formally educated*	5.03	3.94	1.08-23.33

*Statistically significant

Discussion

This study explored the relationship between dental phobia and quality of life among patients attending a dental clinic in Accra, Ghana. The prevalence of moderate to high dental fear was 46%, while nearly half of the study population was found to have 'unsatisfactory' OHQoL.

Though methods of assessing dental fear vary through literature, an Australian study reported a prevalence of 32.3%, with different degrees of fear[15]. Cianetti et al., in their review also estimated the prevalence of dental fear to range from 13.3% to 29.3% among adolescents[16]. In comparison, Minja and Kahabuka suggested a prevalence of 5 to 61% in children, and in adults, from 1 to 52%[17]. This current study found a 46% prevalence of dental fear. Furthermore, eight percent of the population had high fear, who were more likely to be females, though males generally had more dental fear. In comparison to this observation, Cianetti et al[16]. asserted a higher frequency of dental phobia in females than males.

Described to link stimuli to patterns of outcome, the concept of fear is itself rooted in an intricate mix of human physiology and environmental elements[18]. It is evident in literature that while fear is influenced by socio-cultural factors, it also affects behaviours, as is characteristically the case in odontophobia[3]. As Ghana's oral healthcare system develops, it is important that the potential barriers to delivery and access are weighed with the changing environment. This study firstly shows that dental fear is prevalent in a typical Ghanaian clinical setting. This is an essential factor for clinicians, managers, and potential clients for adequate preparation to be made in various settings. Relaxation techniques, reassurances and modification in clinical settings are simple interventions that could be employed to reduce dental fear and its immediate effects. Non-pharmacological methods such as effective communication, sufficient time allocation, distractions, effective behaviour therapies among others, could be employed, as well as pharmacological means[17].

In this study, the common causes of dental phobia included injection, x-ray procedures, the general clinic environment and the sound of the headpiece. In some cultures, the individual's perceptions as well as negative attitudes in a person's family are some of the factors that significantly determine their fear[19]. It could therefore be the case that many causative factors have some relationship with previous experiences of patients.

Although nearly half of the study population had 'unsatisfactory' quality of life, it is noteworthy that those with high fear, were more likely to have 'satisfactory' OHQoL, likewise the participants who were not formally educated. Phobic dental patients would typically experience significantly increased anxiety and subsequently, negative quality of life[20]. Several publications have suggested this as a likely long-term consequence[21,22]. However, several authors have also suggested that the behavioral impacts of odontophobia include not only avoidance but other behaviors related to eating, self-medication, aggression, as well as oral hygiene[23,24]. This could have accounted for the observation in this current study, where patients with high fear might have adopted behaviours which rather improved OHQoL. This area of clinical care however requires more research in our peculiar region.

There are some limitations to our study. The study design does not allow for causal inferences. Our study population was also from clinic attendants, which could have influenced the responses of the participants. Again, there were also few variables explored. This study nevertheless provides interesting findings to inform future explorations into the area.

Conclusion

Dental phobia was prevalent among the dental clinic attendants. The commonest source of dental fear was injections, followed by the x-ray apparatus. Participants with high dental fear were found to be more likely to have good OHQoL. While further research is required in the subject area, clinicians and stakeholders should not under-estimate its prevalence and potential effects.

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