Health Locus of Control as Predictor of Dental Anxiety: Dental Patients at University College Hospital in Ibadan

by

Johnson Tunde Oyeleke, Ph.D.
oyeleke.johnson@dlc.ui.edu.ng
Department of Psychology,
Distance Learning Center, University of Ibadan, Nigeria

&

Ojewumi Aderemi Kehinde
ojewumikehinde@yahoo.com
Department of Psychology,
Obafemi Awolowo University, Ile-Ife, Nigeria

Abstract

Anxiety among dental patients has become a worrisome health issue associated with a far-reaching negative implication on general well-being. This study therefore investigated health locus of control as predictor of anxiety among dental patients at the University College Hospital in Ibadan, Nigeria. The study utilised a cross-sectional research design; data was gathered using a self-report questionnaire with a total of 338 randomly selected dental patients attending dental clinic at the University College Hospital participated in the study. 199 (58.9%) were females and 139 (41.1%) were males; the mean age was 39 year. The hypotheses generated were all tested using inferential statistics; and the results showed that dental patients with external locus of control scored significantly higher on dental anxiety than dental patients with internal locus of control. The study concludes that locus of control predicted dental anxiety, and that there was a significant difference in dental anxiety as a result of the locus of control among dental patients. And finally, the implications and recommendations of the findings were discussed.

Key words: dental anxiety, locus of control, external and internal locus of control, psychological interventions.

Introduction

Over the last decade, the demand for dental services has increased; mostly due to increased awareness among the public of the consequences of poor dental health. Alongside this increase in demand of dental services, there has been a proportional increase in the number of people who experience symptoms ranging from dislike to phobia regarding dental treatment (Ingersoll, Bowman, Robertson & Walker, 2003). These individuals find dental procedures so distressing that they experience acute anxiety symptoms such as increased sympathetic nervous system output, uneasiness, apprehension, tension from anticipating danger, irritability, and avoidance when in a dental environment (Ingersoll et.al 2003). Despite these gains in awareness of the importance of dental health, anxiety related to the dental environment and to specific dental treatments is a problem suffered by many patients worldwide, and it remains a significant challenge in providing dental care.

Anxiety is a phenomenon that people frequently encounter in their daily life and this can be described as: "the tense, unsettling anticipation of a threatening but vague event; a feeling of uneasy suspense" (Rachman, 2004).

Dental anxiety is defined as a patient's response to the stress that is specific to the dental situation (Corah, Gale & Illig, 2002). Given its high prevalence, Gatchell (2004), indicated that 70 percent of patients visiting the dentist exhibit feelings of apprehension and 15 percent avoid dental visits due to their anxiety. Only a minority of patients claims to have no anxiety in the dental environment (Ingersoll et.al 2003). Dental anxiety is a multidimensional complex phenomenon, and no one single variable can exclusively account for its development. Within several literatures, a number of factors have consistently been linked with a greater incidence of dental anxiety, including: personality characteristics, fear of pain, past traumatic dental experiences, particularly in childhood (conditioning experiences), blood-injury fears (Locker, Shapiro & Liddell, 2006). Hence, this study is designed to examine the influence of health locus of control on anxiety among dental patients.

Similar to studies showing relationship between locus of control with several chronic diseases like diabetes, asthma and cardiovascular diseases, locus of control is also related to dental health (Bowyer, Sutcliffe, Ireland, Lindenmeyer, Gadsby,. Graveney, Sturt & Dale, 2011). However literature search reveals that limited studies have been conducted relating to multidimensional health locus of control, dental health locus of control, dental health values, plaque and gingival health status and oral health related behaviors (Stenstorm, Einarson, Jacobsson, Lindmark, Wenander & Hugoson, 2009).

Dental anxiety has been ranked fifth among commonly feared situations (Sylvester & Oliveau, 2005) and it is also considered the major reason for avoidance of dental care; thus resulting in deterioration of personal oral health. These conditions occur in people of any age and social status, but mostly prevalent among 25-26-year-olds who mostly experience higher dental anxiety than other people (Stenstorm et.al 2009). This can be accounted for by the diverse effects of a number of psychological factors in this age range that can induce dental fear and dental anxiety. Major procedures that are considered to induce anxiety are the local anesthetic injection and teeth drilling (Stenstorm et.al 2009), and consequently it has been shown that between 2.6 percent to 20.4 percent of the general population exhibit dental anxiety (Locker et.al 2006) while approximately 45 million people in the United States are suffering from dental fear (Doebling & Rowe 2000).

This type of phobic or anxious behavior regarding dental practitioners and procedures could have acute consequences for the oral and psychological health of those affected. Most people recognize the importance of dental health, but a significant proportion of the population find dental procedures so extremely distressing that it has elicited attention from both medical and psychological investigations. And interestingly, research has showed that the largest proportion of dentally anxious patients had a self-perception of being inferior with respect to some area of bodily appearance or function (Schuller, Willumsen & Holst 2003). Hence, in this study, we ask will health locus of control predict anxiety among dental patients at the University Collage Hospital in Ibadan, Nigeria, and is there a significant relationship between the health locus of control and dental anxiety among dental patients at the same location?

Literature Review

Over recent decades, the everyday clinical practice of dentistry has benefited from major advances in techniques, technologies and materials, as well as in infection control procedures and at the same time, public awareness of oral health has improved (Rachman, 2004). Despite these gains, anxiety related to the dental environment and to specific dental treatments is a problem suffered by many patients worldwide, and it remains a significant challenge in providing dental care. Whereas anxiety is an emotional state that helps normal individuals to defend themselves against a variety of threats, anxiety disorders are a dysregulation of these normal defensive mechanisms, with either excessive or deficient responses (Rachman, 2004). Dental anxiety has been ranked high among commonly feared situations (Agras, Sylvester & Oliveau, 2008) and therefore given its high prevalence; it is not unexpected that patients with dental anxiety avoid dental visits (Ingersoll et.al 2003). Thus, only a minority of patients claim to have no anxiety in the dental environment. In Australia, published data revealed that some 14.9 % of adults could be classified as "high dentally anxious" and that there was a greater prevalence and severity of dental anxiety in women than men, particularly in the 35-44-age range (Thomson, Stewart, Carter & Spencer, 1996).

Many cross-sectional studies have documented that the prevalence of dental anxiety reduces with age (Holtzman, Berg, Mann & Berkey 2007), and this has been confirmed in a longitudinal study conducted by Hagglin et al (2008) which followed individuals from 1969 to 1996.

In relation to gender, the large majority of studies have found higher prevalence rates for dental anxiety in females than males (Neverlien, 2000; Hagglin, Berggren, Hakeberg, Hallstrom, Bengtsson, 2006 & 2008; Doerr, Lang, Nyquist, Ronis, 2008). The relationships between dental anxiety and other demographic variables such as income level and education (socioeconomic status) have not been fully elucidated. While some studies have demonstrated that higher levels of dental anxiety are associated with low income and education, other has failed to find such relationships. Taken in combination with other variables, it would be expected that being female, having a low income, and having a low perception of one's oral health status would be linked with higher levels of dental anxiety, and this combination has been confirmed in a study by Doerr et al 2000 (Hagglin et.al 2008; Doerr, Lang, Nyquist, & Ronis, 2008).

Fear of pain has been linked strongly to the development of dental anxiety and to avoidance of dental treatment (Kleinknecht , Klepac, Alexander , 2003; Woolgrove , Cumberbatch , 2007). Dental anxiety has been associated strongly with poor oral health status. Higher dental anxiety scores have been documented amongst patients who have not visited a dentist for the last 5 years and were more likely to skip or cancel appointments or to hesitate in making dental appointments (Schuller & Willumsen 2003). Even if anxious dental patients attend regular dental visits, they are likely to avoid necessary follow up appointments to complete the required dental treatment. This avoidance of dental treatment results in higher caries prevalence, leading to a greater need for oral rehabilitation (Berggren & Carlsson, 2003).

For example, Locker and Liddell found that dentally anxious patients had significantly more missing teeth and fewer filled teeth compared to non-anxious patients (Locker, & Liddell, 2001). A spiral situation can occur, where poor oral health and a patient's inability to accept dental treatment, leads to feelings of inferiority and shame, which in combination may lead to greater anxiety and further avoidance of dental care. The long-term consequences for the dentition may explain why dental anxiety leads to increased use of general medical services for prescription of antibiotics and analgesics (Locker, 2003; Milgrom & Getz, 1999). Other problems that dentists may encounter with anxious patients include reduced satisfaction with treatment planned or provided. Several studies have revealed a relationship between dental anxiety and satisfaction with the appearance of one's mouth. Highly anxious patients are more likely to be dissatisfied with the appearance of their teeth. They may also have a heightened expectation that the treatment will be unpleasant (Woolgrove & Cumberbatch, 2007). As would be expected, a patient's attitude toward dentists has been shown to have an inverse linear relationship with dental anxiety, that is, more anxious patients were less positive about their dentist (Doerr et.al 2008). Moreover, as patients' perceptions of dentists' competence decreased, their dental anxiety was found to increase (Cohen, S. M., Fiske, J., & Newton, 2000).

Nearly two thirds of dentists believe that treating an anxious patient presents a challenge to them in everyday practice. Identifying these patients and putting appropriate measures in place is therefore essential. Patients displaying behaviors such as frequent cancellation, delaying or rescheduling appointments may be doing so because of dental fear and anxiety.

The management of anxious patients will vary depending on factors such as the patients' age, anticipated degree of cooperation, and their medical and/or dental history. Dentist behaviors targeted to anxiety reduction, such as having a calm manner, being friendly, giving moral support, being reassuring about pain, preventing pain, and working efficiently, have been shown to reduce anxiety (Corah, O'Shea, Bissell, Thines & Mendola, 2002).

From history, most of the work linking perceived control and health evolved from Rotter's (1965) social learning theory. 'Locus' the Latin word for 'place' was dichotomized by Rotter into internal and external Locus of control. Internal locus of control refers to degree to which an individual perceives that events which occur to them are causally related to their own behavior. When perception of a causal relationship is strong, the individual is described as high in internal control. When events are perceived as determined by outside forces over which the individual has little or no control, then it is called as external locus of control which consists of components like chance or luck locus of control and powerful others locus of control (Waite, Todd-Pokropek & Barnby, 2001).

An individual locus of control beliefs could predict his/her corresponding health behavior and health values as those who believe they have control over their own health will, place a high value on their health and are more likely to pursue health promoting behavior. Hence, there are studies showing relationship between Locus of control with chronic diseases like diabetes, asthma and cardiovascular diseases. However, limited studies have been conducted in relation to multidimensional health locus of control and oral health related behaviors (Lewis, Morisky & Flynn, 2008)

For example, a study was conducted among 14 males and 46 females to investigate the relationship between multidimensional health locus of control (MHLC) and the response of a group of office workers to a plaque control program. There was a significant correlation between the external MHLC dimension of powerful others and improvement in some of clinical criteria; a similar result was found for the internal dimension of the MHLC. There was a minimum correlation between the external dimension of MHLC termed chance and the clinical results. It was concluded that subjects who perceive their susceptibility to disease being influenced by powerful external factors or who believe that susceptibility can be controlled by their own actions, respond more positively to a plaque control regime than those subjects who consider that susceptibility to disease is an event of chance (Blanaid, Richard, Batchelor, & Elizabeth, 2002).

And another study was conducted among patients aged 20-60 years with untreated periodontitis who had been referred for periodontal treatment in a university clinic. Questionnaires assessing multidimensional health locus of control and oral health impact profile were posted to subjects who attended for initial periodontal consultation and were returned by 127 patients who attended. Repeat questionnaires were sent to all subjects 6 months later when they had received some oral hygiene instruction, scaling, root planning, and 55 were returned. Comparison of data for those subjects who completed both questionnaires showed no difference in locus of control but showed a trend ($p=0.065$) towards reduced oral health impact profile. (i.e., improved oral health related quality of life) (Bajwa, Watts, Newton, 2007).

Third, Stenstorm et al. (2009) also conducted a study among 217 Swedish university students using a video program .Before the video program was presented, assessment were made of multidimensional health locus of control (MHLC), dental health locus of control (DHLC) and dental health values (DHVs). Plaque and gingival indices (PL1 and GL1) were obtained in a clinical examination before and 10 weeks after (PL2 andGL2) presentation of video program. The results showed that females exhibited statistically significant better PL1 and GL1 values and stronger DHVs than males. Also, better GL1 values were found to be statistically significant and related to stronger DHVs for females, than males. For males, stronger internal DHLC was related to more plaque at the final examination (PL2). The psychological scales which showed some relationship to the measure of dental health were DHLC and DHVs. Gender was the strongest related variable to dental health (Stenstorm et.al 2009).

Lastly, Acharya and Sangam (2010), conducted a research among 325 dental students at Manipal College of Dental Sciences in India to assess dental anxiety and discover its relationship with the perceived health locus of control among students using the multidimensional health locus of control (MHLC) scale (internal, chance and powerful others) and modified dental anxiety scale (MDAS) scale. The result showed that 'internal' was the most powerful of the three aspects of MHLC among all three anxiety groups. A statistically significant inverse correlation was also found between the 'internal' dimension of MHLC and dental anxiety, and thus, perceived MHLC was found to play an important role in predicting the dental anxiety among dental students with healthy non-bleeding gingiva ($p<0.05$) (Acharya,& Sangam, 2010).

Hypotheses of the Study

The hypotheses of the study is that female participants will score significantly higher on the measures of dental anxiety than their male counterparts among dental patients; dental patients' with external locus of control will score significantly higher on the measures of dental anxiety than dental patients' with internal locus of control among dental patients; and that age, religion, dental problem duration, marital status and education will predict significant joint and independent influence of dental anxiety among the dental patients.

.

134

Methodology

In the research design, this study utilized a cross-sectional research design; data was gathered once-off by means of self-report questionnaires, and quantitative methods were used to enable the research to systematically explore large amounts of information gathered with the questionnaires based on the participation of 338 dental patients receiving treatments at the dental clinic at the University College Hospital in Ibadan, Nigeria. The setting (UCH) was selected because of the popularity, proximity and accessibility to dental patients and potential participants in the area, and it is considered to have the highest number of dental patients in Ibadan.

Sampling Technique

Accidental sampling technique was adopted for the study; this is because participants were approached at the dental clinics and as many that gave their consent were given a battery of questionnaires to complete. The frequency distribution results showed that out of the four hundred (400) participants adopted in this study, three hundred and thirty eight (338) participants completed their questionnaires. The frequency distribution of participants by gender was 199 (58.9%) female and 139 (41.1%) male; the age distribution ranged between 20-25yrs and 41yrs and above; religion distribution showed that 203 (61.1%) were Christian, and the remaining 135 (39.9%) were of the Islamic faith.

And in regards to dental problem duration, the distribution of participants indicated that participants that had dental problem between 0-5years were 221 (65.4%); 6-10years were 93 (27.5%); 11yrs and above were 24 (7.1%); 116(34.3%) were married; 212 (62.7%) were single and 10 (3.0%) reported to be divorcee. Distribution by section indicated that 221 (65.4%) were in oral surgery; 88 (26.0%) were in restorative; 27 (8.0%) were in prevention section. And the educational qualification distribution of participants showed that 59 (17.5%) were holders of secondary school certificates, 70 (20.7%) were holders of OND/NCE, 18 (5.3%) were holders of HND certificates, University first degree occupied 89 (26.3%) and participants who claimed having higher degrees were 96 representing (28.4%) of the 338 sample size.

Measuring Instruments

This study utilized questionnaire as means for data collection which comprised of two sections, socio-demographic which section tapped demographic data of the respondents such as age, gender, religion and ethnicity; and a Multidimensional Health Locus of Control Test (MHLC), a 18- item questionnaire measuring beliefs about the causes and cures of illness developed by Walston, Walston, Kaplan & Maides (1976) with reliability estimates for the scales indicating internal consistency with Cronbach's alpha of between a = .67 to a = .77 for all six scales (three dimensions and two forms), with the combining the two forms creating a 12- item scale resulted in alphas, which ranged from a = .83 to a = .86. Thus, the reliability coefficient obtained for this scale in this study is .72, which is very high and acceptable.

Data Collection Procedure and Results

The questionnaires were distributed personally to the randomly selected participants by approaching them individually at the dental clinic. After agreeing to participate in the study, the nature and purpose of the study was duly explained to the participants before they were asked to respond to the questionnaire, and the fully completed questionnaires were collated, sorted and coded for data analysis. And specifically the study provided answers to three research hypotheses with statistical tests used to include t-test for independent samples and multiple regression analysis for predictions.

Hypothesis One

Female participants will score significantly higher on the measures of dental anxiety than their male counterparts among dental patients. The hypothesis was tested with t-test for the independent samples, and the result is presented in table1

Table 1: Summary of t-test for the independent samples showing the influence of sex on dental anxiety

	Sex	N	Mean	S.D	**Df**	**t**	P
dental anxiety	Female	199	17.22	4.611	336	-.761	>.01
	Male	139	17.61	4.685			

Table 1 results indicate that female participants did not score significantly higher on dental anxiety than their male's counterpart among dental patients at University College Hospital in Ibadan. However, female participants' recorded a mean of (17.22) and male participants recorded a mean score of (17.61). This result implies that there is no significant different in the sex of participants on the measures of dental anxiety among the study sample, therefore, the result did not confirm the stated hypothesis, and it was rejected in this study.

Hypothesis Two

Dental patients' with external locus of control will score significantly higher on the measures of dental anxiety than dental patients' with internal locus of control among dental patients in UCH, Ibadan. The hypothesis was tested with t-test for the independent samples and result is presented in table 2.

Table 2: Summary of t-test for the independent samples showing the influence of internal and external locus of control on dental anxiety

	Locus of control	N	Mean	S.D	**Df**	**t**	P
dental anxiety	Internal	125	13.67	3.613	336	16.538	<.01
	External	213	19.97	3.199			

Table 2 results indicate that dental patients with external locus of control scored significantly higher on dental anxiety than dental patients with internal locus of control among dental patients in UCH, Ibadan t(336) = 16.538; P<.01). However, dental patients with external locus of control recorded a mean of (13.67) and dental patients with internal locus of control recorded a mean score of (19.97). This result implies that there is significant difference between external locus of control and internal locus of control among dental patients in UCH, Ibadan. Therefore, the result confirmed the stated hypothesis and it is accepted in this study.

Hypothesis Three

Age, religion, dental problem duration, marital status and education will predict significant joint and independent influence of dental; anxiety among dental patients in UCH, Ibadan. This hypothesis was tested using multiple regressions and the results are presented on table 3

Table 3: Summary of Multiple Regressions showing the Influence of age, religion, dental problem duration, marital status and educational qualification on dental anxiety

Variable	R	R^2	F	P	β	t	Sig
Age					.148	2.801	<.05
Religion					-.072	-1.431	>.05
Dental prob. duration	.345	.119	8.985	<.01	.032	.605	>.05
Marital status					-.156	-2.916	<.05
Highest Qualification					.215	3.958	<.01

Dependent variable: dental anxiety

137

The results in table 3 showed that age, religion, dental problem duration, marital status and educational qualification jointly predicted entrepreneurial success among dental patients in UCH, Ibadan, (R = .345; R^2 =.119; F (5,332) = 8.985; P<.01). This implies that age, religion, dental problem duration, marital status and educational qualification jointly accounted for about 11.9% variance in dental anxiety while the remaining 88.1% could be attributed to other variables not considered in this study. However, the analysis of the independent predictions indicated that age, marital status and educational qualification predicted significant independent influence on dental anxiety (β = .148; t =2.801; P<.05); (β = -.156; t = -2.916; P<.05); (β = .215; t = 3.958; P<.01) among dental patients in UCH, Ibadan. Therefore, the stated hypothesis is supported by the result obtained and it is accepted in this study

Discussion

The first hypothesis stated that female participants will score significantly higher on the measures of dental anxiety than their male counterparts among dental patients in UCH, Ibadan; the hypothesis was tested with t-test for the independent samples and result indicated that female participants did not score significantly higher on dental anxiety than their males among dental patients in UCH, Ibadan. This result implies that there is no significant difference in the sex of participants on the measures of dental anxiety among the study sample.

The result contradicted the study by Stenstorm et al. (2009) in Sweden where their results revealed that females' participants exhibited statistically significant better PL1 and GL1 values and stronger DHVs than males. Also, better GL1 values were found to be statistically significant and related to stronger DHVs for females than in males; but for males, stronger internal DHLC was related to more plaque at the final examination (PL2). The psychological scales which showed some relationship to the measure of dental health were DHLC and DHVs. Gender in this study was the strongest related variable to dental health (Stenstorm, Einarson, Jacobsson, Lindmark, Wenander, Hugoson, 2009). In relation to gender, the large majority of studies have found higher prevalence rates for dental anxiety in females than males (Neverlien, 1990; Hagglin, Berggren, Hakeberg, Hallstrom, Bengtsson, 1968 & 1996; Doerr, Lang, Nyquist, Ronis, 1998), with only few noting no significant relationship.

Hypothesis two stated that dental patients' with external locus of control will score significantly higher on the measures of dental anxiety than dental patients' with internal locus of control among dental patients in UCH, Ibadan. The hypothesis was tested with t-test for the independent samples and result indicate that dental patients with external locus of control scored significantly higher on dental anxiety than dental patients with internal locus of control among dental patients in UCH, Ibadan. This result implies that there is significant different between external locus of control and internal locus of control among dental patients in UCH, Ibadan.

In a study by Blanaid, Richard, Batchelor and Elizabeth, (2002) it was found that a significant correlation exist between the external health locus of control dimension of powerful others and improvement in some of clinical criteria. It was concluded that participants who perceive their susceptibility to disease being influenced by powerful external factors or who believe that susceptibility can be controlled by their own actions, respond more positively to a plaque control regime than participants who consider that susceptibility to disease is an event of chance. Another study conducted among 99 male veterans aged 41-66years in an outpatient clinic. In this study dental control beliefs scale (DCBS) was used to study the relationship between plaque index and dental beliefs. The DCBS was administered to participants; at the same time the standard oral hygiene was determined by the use of the plaque index scoring system. Four clusters of DCBS were labeled as internal locus of control (15 items), external locus of control (15 items), self-efficacy (8 items), and oral health beliefs (6 items). Nine of the 10 items who significantly correlated with plaque index were members of the external locus of control component. Thus, beliefs rating to increased external locus of control were related to higher plaque index (Wolfe, Stewart, Hartz, 1991).

The third hypothesis which states that age, religion, dental problem duration, marital status and educational qualification will predict significant joint and independent influence of dental anxiety among dental patients in UCH, Ibadan was tested using multiple regressions and the results showed that age, religion, dental problem duration, marital status and educational qualification jointly predicted dental anxiety among dental patients in UCH, Ibadan. The analysis of the independent predictions indicated that age, marital status and educational qualification predicted significant independent influence on dental anxiety among dental patients in UCH, Ibadan. Even though there has not been much literature review that support this particular hypothesis in the present study, it was reported in the literatures that in a study by Stouthard and Hoogstraten that more than 50 percent of the populations in industrialized countries were apprehensive while attending the dentist, whereas 15 percent regularly avoid dental care because of their anxiety which may be as a result of age,or any other demographic variables (Stouthard & Hoogstraten, 1999).

Conclusion

The result of this research reveals that there is no significant different in the sex of participants on the measures of dental anxiety among the study sample. A significant different exists between external locus of control and internal locus of control among dental patients and further results of multiple regression analysis results showed that age, religion, dental problem duration, marital status and educational qualification jointly predicted dental anxiety while independent predictions indicated that age, marital status and educational qualification predicted significant independent influence on dental anxiety among dental patients in UCH, Ibadan.

Recommendations

The results of this study, keeping other things constant, have proved that dental anxiety of dental patients in UCH, Ibadan is influenced by locus of control, and demographic variables which include marital status, age group and educational level. Suffice to say that clinical and health psychologists may be of great help as a proper healthy dental awareness could go a long way in reducing the anxiety that arises as a result of poor dental approach, such that it may be possible to develop a program to address such problems if the extent and patterns of dental anxiety prevention practices are identified on time. Schools (primary, secondary and tertiary institutions) is another suitable point of group awareness on how to go about healthy dental upkeep because many people suffering from dental problems in Nigeria are either afraid of visiting the hospital due to fear of pain (dental anxiety) or does not know the right medical practitioners capable of handling their dental problems.

References

Acharya, S. and Sangam, J. (2010) Factors affecting dental anxiety and beliefs in an Indian population. *Journal Oral Rehabilitation 35, 259-267*.

Agras, F., Sylvester K.H., Oliveau et al., (2008). The importance of dental beliefs for the outcome of dental-fear treatment. *Europian Journal Oral Sci 111, 99-105*.

Bajwa K. and Watts. P (2007) Translation and validation of an Arabic version of the UK oral health related quality of life measure (OHQoL-UK) in Syria, Egypt and Saudi Arabia. *Community Dent Health 20, 241- 245*.

Berggren, U. and Carlsson S.G. (2003).Psychometric measures of dental fear. *Community Dent Oral Epidemiol 12, 319-324*.

Blanaid, R (2002) Explanatory models for clinically determined and symptom-reported caries indicators in an adult population. Acta Odontol Scand 57, 132-138.

Bowyer. V., Sutcliffe, P., Ireland, R., Lindenmeyer, Gadsby, A.R., Graveney, M., Sturt, J., & Dale, J (2011). Oral health awareness in adult patients with diabetes: a questionnaire study *British Dental Journal 211, E12*

Corah, N. L., Gale, E. N., & Illing, S. J. (2002) Development of a dental anxiety scale. *J Dent Res 48, 596*.

Corah, N.L., O'shea, P., Bisell, Thines & Mendola, (2002). Development of a dental anxiety scale. *J Dent Res 48, 596*.

Doebling S, & Rowe MM (2000) Negative perceptions of dental stimuli and their effects on dental fear. *Journal of Dent Hyg 74, 110-116*.

Doerr C., Lang., P, Nyquist, H & Ronis (2008) Pilot survey of oral health related quality of life: a cross-sectional study of adults in Benin City, Edo State, Nigeria. *BMC Oral Health 5, 7. 254*

Gatchel, T.K (2004). The Biopsychosocial Approach to Chronic Pain: Scientific Advances and Future. American Psychology. 59; 792-805

Hägglin C, Berggren U, Hakeberg M, Ahlqwist M (2008) Dental anxiety among middle-aged and elderly women in Sweden. *A study of oral state, utilization of dental services and concomitant factors. Gerodontology 13, 25-34*.

Hägglin C, Hakeberg M, Ahlqwist M, Sullivan M, Berggren U (2008) Factors associated with dental anxiety and attendance in middle-aged and elderly women. *Community Dent Oral Epidemiology 28, 451- 460.*

Holtzman J, Berg R, Mann J, Berkey DB (1997) The relationship of age and gender to fear and anxiety response to dental care. *Spec Care Dentist 17, 82-87*

Ingersoll. D, Bowman. T.Y, Robertson & Walker . J, (2003). Development of a dental anxiety scale. *Journal of Dental Restoration, 48*(4), 596.

Kleinknecht, R., Klepac, R. K., & Alexander, R. D. (2003). Origins and characteristic of fear of dentistry. *The Journal of the American Dental Association, 86*, 842-848.

Locker D (2003) Psychosocial consequences of dental fear and anxiety. *Community Dent Oral Epidemiol 23, 144-151.*

Locker D, Poulton R, Thomson WM (2001) Psychological disorders and dental anxiety in a young adult population. Community Dent Oral Epidemiol 29, 456-463.

Locker, D., Shapiro, G & Liddell G (2006). Temperament and character personality dimensions in patients with dental anxiety. European Journal of Oral Science. 111, 93-98.

Milgrom, P., Coldwell, S. E., Getz, T., Weinstein, P., & Ramsey, D. S. (1999). Four dimensions of fear of dental injections. *The Journal of the American Dental Association, 128*, 756-762.

Rachaman . W (2004) Oral health-related quality of life in patients with dental anxiety. *Community Dent Oral Epidemiology 35, 357-363*

Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology, 43*, 56-67.
.
Schuller, A.A., Willumsen, T., Holst, D. (2003). Are their differences in oral health and oral health behavior between individuals with high and low dental fear? *Community Dent Oral Epidemiol 31, 116-121.*

Stenstorm, Einarson, Jacobsson, Lindmark, Wenander, Hugoson, (2009). The association between dental anxiety and oral health related quality of life in Britain. *Community Dental Oral Epidemiology 32, 67-72.*

Stouthard, S and Hoogstraten, N. (2009); In Berggren U, Meynert G (1984). Dental fear and avoidance: causes, symptoms, and consequences. J Am Dent Assoc 109, 247-251.

Sylvester, T & Oliveau, N.V. (2005). Accesing primary dental care in three London boroughs. Community Dent Health 14, 108-112.

Thomson, W.M., Locke,r D., & Poulton, R. (2000). Incidence of dental anxiety in young adults in relation to dental treatment experience. *Community Dent Oral Epidemiol 28, 289-294.*

Waite, N., Todd, C., & Pokropek, R. (2003). Measuring the impact of oral health on quality of life in Britain using *Journal of Consulting and Clinical Psychology. 44(4); 580-588* OHQoL-UK(W). *Journal of Public Health Dent 63, 73-77.*

Walston, B.S., Walston, K.A., Kaplan, G.D., & Maides, S.A. (1976). Development and validation of the Health Locus of Control scale.

Wood,W.D & Letak, J.K (1983). A mental-health locus of control scale; *Personality and Individual Differences; (4) 5, Page 58.*

Wolfe G.D and Hartz T.I (2001) Measuring oral health and quality of life. University of North Carolina Dental Ecology, Chapel Hill.