



ISSN 2278 – 0211 (Online)

Factors Influencing Parental Dental Anxiety and Dental Caries Experience among 3-5-Year-Old Children Attending Three Public Paediatric Dental Clinics in Nairobi, Kenya

Nicholas Gichu

Consultant Paediatric Dentist, Department of Paediatric Dentistry & Orthodontics,
School of Dental Sciences, College of Health Sciences University of Nairobi, Kenya

Gladys N. Opinya

Professor, Department of Paediatric Dentistry & Orthodontics,
School of Dental Sciences, College of Health Sciences University of Nairobi, Kenya

Abstract:

Objective: To determine the relationship between parental anxieties associated with past dental experiences and children's caries experience in 3-5-year-olds.

Design: A descriptive cross-sectional study.

Setting: The study was conducted within the urban Nairobi city in Kenya at the School of Dental Sciences-University of Nairobi Dental Hospital, Kenyatta National Hospital (K.N.H) -Dental Clinic, and the Lady Northey Children's Clinic

Subjects: The study population was purposively sampled and involved 330 children aged 3-5 years and the accompanying parents/guardians. Parental anxiety was measured using the Modified Dental Anxiety Scale, and dental caries was measured using the dmft index.

Results: Prevalence of high anxiety was 3.9%; among those with high anxiety 12 (92.3%) were mothers, 1(7.7%) were fathers, however, none of the guardians had any high anxiety. High dental anxiety was found among those in the <30 year-age group 6 (5%). Also, parents in formal employment 5(7.2%) and with tertiary education 5 (10.2%) also had high dental anxiety. There was no relationship between parental concern and previous clinical experience ($p=0.40$). Similarly, no association between parental/guardian anxiety and history of previously visiting a dentist or not was obtained ($p=0.09$). However, parents/guardians were accurately able to rate their anxiety correctly ($p=0.00$).

Prevalence of dental caries was 93.6% while the caries experience as mean dmft was 8.14. The untreated component of decay was high with a decay component of 7.27, the mean missing component was 0.80, and the mean filled part of 0.06. The decrease in caries experience was found to increase with age, and this was statistically significant ($p=0.01$). The association between parental anxiety and the children's caries experience was not significant ($p=0.42$). The caregiver's past negative or positive experiences did not influence the severity and prevalence of the children in all the age groups.

Conclusion: There was a low prevalence of high anxiety 3.9% associated with past dental experiences. However, high anxiety was observed in mothers, the younger parents, those with higher education as well as those in the formal employment. There was a high dmft score of the children of 8.14 with the decay (d) component contributing a higher proportion of 7.27, and the decay was highest in the younger age group of three years. However, there was no relationship between dental caries experience and the parental dental anxiety. Nor was there any relationship between the past positive or negative experiences of the caregivers and children's dental caries experience.

Keywords: Child, Behaviour, Caregiver, past negative, positive dental experiences, Caries

1. Introduction

Anxiety may be defined as a state or feeling of uncertainty associated with the unknown or known previous negative expenses or influences [i]. Fear and anxiety are highly interchangeable terms. Fear has been defined as a physiological, behavioural and emotional response to a feared dental stimulus. Anxiety is a feeling of dread or worries focused on, yet temporarily before, exposure to the feared stimulus. The main difference between severe dental fear and dental phobia is related to the impact it has on healthy functioning [ii]. Anxiety experience is a universal human phenomenon. Studies have shown a worldwide prevalence of dental anxiety to varying between of 3-43% [iii]. An Australian study showed that the

prevalence of dental fear was 16.1%, with the same research reporting higher levels of dental anxiety among females than in males [iv]. In Saudi Arabia, levels of dental anxiety have been reported in 5% of all dental clinic attendees [v] while in Toronto, the prevalence in the population was 16.4% [vi] and in Turkey, 21% of adults had dental anxiety [vii]. It has also been that reported there is a variation in prevalence of between 6-15% [viii]. The reported age of onset of anxiety was as follows: childhood onset was 50.9% while 22.0% onset was observed in adolescence, and 27.1% in adulthood [vi].

Since dental anxiety is involved with a multifactorial aetiology, studies that examine the reasons for the development of dental anxiety face numerous problems. Subjects from varied socio-economic and cultural backgrounds are exposed to different dental experiences during childhood and early adolescence. Thus, it is almost impossible to define the primary cause in the development of dental anxiety [ix].

Other reasons of fear of a dentist are fear of the unknown, embarrassment about the current condition of teeth, fear of the dentist's drill, dental injection [x], and horrific stories from friends about traumatic experiences, the cost of treatment and risk of cross-infection, especially to HIV infection. [xi].

Anxiety has been attributed to occur as a result of frightening comments or information made by other children and adults. In fact, such information constitutes essential reasons found to keep some adults from visiting a dentist [xi]. To bolster this assertion, dental patients who are fearful have been seen to come from families who have had unpleasant experiences, especially where these fears are typically expressed. A Dental Phobia Study among the Saudis reported that patients with dental fear had a more significant family history of dental phobia [xii]. Research carried out, similarly revealed that a family history of dental anxiety was predictive of dental fear in children [xiii].

Maternal dental fear has been reported to be an essential aetiological factor in the development of dental fear in children [xiv]. By body language, a mother may unknowingly transmit her anxiety to the child [xv]. Mothers who tend to have a negative attitude may have had past negative experiences in life or a dental office. A negative attitude may be due to a lack of knowledge and information about the specific dental procedure as was found in a study in Nigeria that reported 63.7% of mothers had never attended a dental clinic [xvi]. Among the 6-year-olds, father's education positively modified the effect of a child's caries experience and child dental fear [xvii]. Individual who are dental phobic are also widely affected by dental anxiety

Dental anxiety may manifest in five different ways: physiological disturbance; behavioural changes. Also, as cognitive changes, alterations in health and of social roles. The nature of the impact of dental anxiety varies at different times. The effect is most significant immediately before and on the day of the dental appointment [xviii]. Physiological effects include signs and symptoms of the fright response and feelings of exhaustion after a dental office visit. The impact on cognitive change may be negative thoughts, beliefs, and fears. Behavioural effects may also include avoidance. It may also affect behaviours related to eating, oral hygiene, self-medication, crying, and aggression. The main impact of dental anxiety on general health was as a consequence of sleep disturbance [xviii].

Studies have shown that those experiencing high levels of dental anxiety were among those with the poorest oral health [xix]. This anxiety causes patients not to present for check-ups or worse present only when the condition has deteriorated, and pain is the only reason that they visit the dentist. Similarly, parents may take their children late to the clinic as a result of their fear [xx, xxi]. Anxiety has been related to avoidance of or flight from dental treatment, even when treatment is essential, thus affecting the oral health of the individual [xxii]. However, pediatric patients sometimes have no choice or say in the matter and are taken by their parents. Few studies are available in the literature on parental dental anxiety and caries prevalence in their children. However, it has been demonstrated that there is a high positive association between maternal dental anxiety and children's dental caries experience [xxiii] also, parents with dental anxiety have children who are caries active [xxiv]. Anxious children have been shown to more likely have anxious parents, these same children with anxious parents were sporadic, irregular attendees, who regularly presented with the symptomatic presentation of pain and had undergone dental extraction in the past [xx, xxi].

If this fear is not addressed, it tends to persist into adulthood thus leading to an increase in the frequency of missed or canceled appointments and patients making only emergency dental visits [xxv].

The reasonably high prevalence of dental fear in the population and the associated impact of dental fear, there are clear clinical implications for oral health professionals regarding both fear identification and treatment. Also, studies on parental anxiety and dental caries have not been carried out in Kenya. It is essential that dentists and allied staff anticipate and are trained to identify anxious parents and patients. After identification, a fearful patient may require extra or extraordinary measures to ensure successful completion of a course of care. Such means may involve providing additional control about the dental procedures, providing more information, taking breaks during the methods and use of distraction techniques.

2. Materials and Methods

2.1. Study Area

The study was a descriptive cross-sectional study. A purposive sampling was used, and three public dental clinics were selected. The study was conducted within the urban Nairobi city in Kenya at the School of Dental Sciences-University of Nairobi Dental Hospital, Kenyatta National Hospital (K.N.H) -Dental Clinic, and the Lady Northey Children's Clinic. The study population involved children aged 3-5 years and the accompanying parents/guardians. There has been reported a prevalence

of bad behaviour of 60% in children whose mothers had had previous unpleasant experiences [xxvi]. Using this prevalence of 60%, at a confidence interval of 95%, or 5% degree of accuracy and using the formulae below the calculated sample size for a sample of >10,000 was 319. The minimum sample size calculated was 319. However, 330 children and their accompanying parents/guardians were involved the added numbers were to cater for attrition if any. All children and parents/guardians who met the inclusion criteria during the duration period of two months for data collection were included in the study.

2.2. Instruments for Data Collection

The caregiver respondents who met the inclusion criteria had a self-administered semi-structured questionnaire for data collection on socio-demographic information, previous clinical experience. In the case where the questionnaire for assessing parental anxiety was not explicit, the first author explained, clarified or translated aspects of the questionnaire to the parents who did not understand particular issues of the questions. Parental anxiety was measured using the "Modified Dental Anxiety Scale." The modified dental anxiety scale divided the respondents into two categories of low and high anxiety. The questionnaire was administered to the parent before the child was treated by qualified dentists who were working in the three public dental clinics. The investigator did not participate in any form of treatment rendered to the child. The investigator observed the behaviour of the children using the Frankel Scale during different types of treatment. A Clinical examination form was used to record the child's caries experience using the dmft index. Clinical examination was carried out using sterile dental mirror and probe. Oral examination was carried out using the light from the dental chair, however, where this was unavailable natural light was used. Pre-coded clinical forms were used to collect data on behaviour and dental caries for both the caregivers and the children

2.3. Validity and Variability

Data validation for Intra and Inter-examiner variability and reliability was obtained by the calibration of the principal investigator. The calculate inter-examiner reliability and the Cohen's Kappa score of 0.95 was obtained for child behaviour. For dental caries, Cohen's Kappa score was 0.89 which was considered as accurate. The intra-examiner variability was obtained through the pre-testing of the study instruments, tools and corrections done. The first ten cases were examined, and after that, a repeat examination was done on every tenth subject and data from the repeated instances had the Cohen's Kappa score of 0.91 was obtained for dental caries which showed right consistency.

2.4. Data Analysis

The data were analysed using statistical package for social sciences [SPSS] 17.0 [SPSS Inc., Chicago, Illinois, USA]. Data was cleaned by checking frequencies and re-entering missing data. The information obtained from the data analysis was presented as descriptive statistics in the form of frequency tables and charts. Computations were done to calculate mean dmft, parental anxiety and child behaviour. Relationships found were tested using appropriate inferential statistics, Mann Whitney Rank, Kruskal Wallis one-way ANOVA, and Pearson Chi-square tests, all tests at a p-value ≤ 0.05 .

Ethical approval was obtained from the Ethics and Research Committee of the University of Nairobi and Kenyatta National Hospital, Kenya. Authority to carry out the study was derived from all the government administrative bodies. Informed consent was obtained from the parents/caregivers, and children's assent obtained. Confidentiality was maintained and information received was only used for the study and the benefit of the community.

Results: Out of the 330 parents/guardians interviewed, 317 (96.1%) had low anxiety while 13 (3.9%) had high anxiety (Fig. 1).

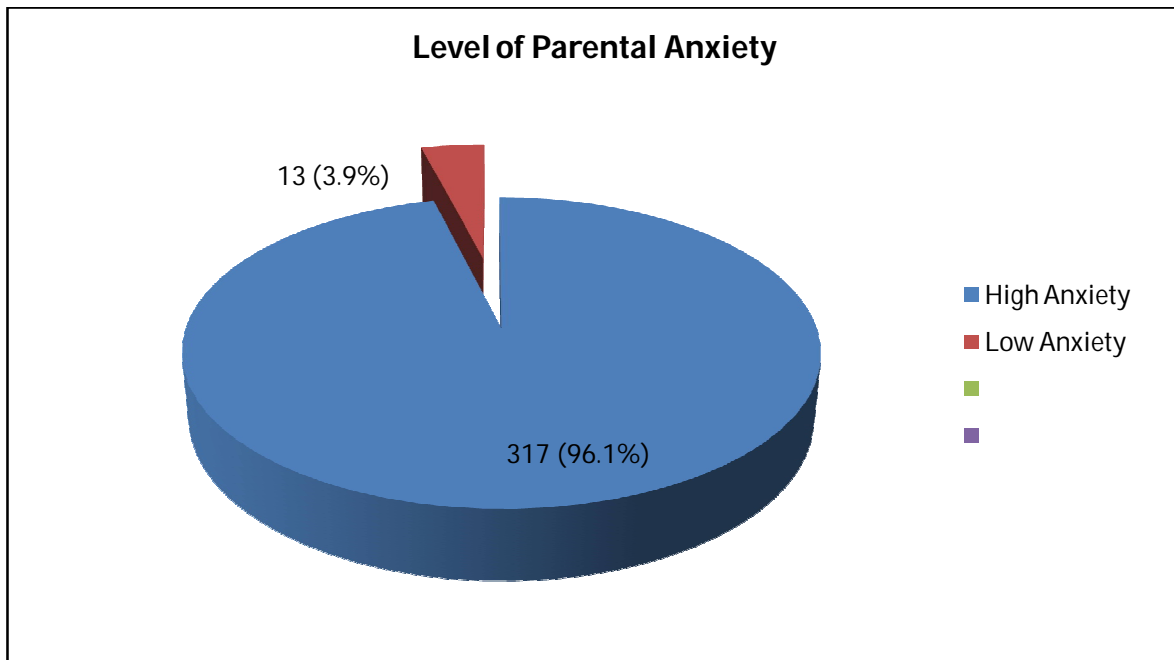


Figure 1: Level of parental anxiety

The highest number of parents/guardians with low anxiety included those who were ≥ 40 years among whom 32 (100%) had low anxiety and none with high anxiety. By comparison, those in the ≤ 30 year-age group 6 (5%), had higher levels of anxiety than those in the 30-40 year-age group 7(4%). (Fig. 2.) That mothers had more anxiety than fathers with 12 (4.8%) of mothers have had high anxiety as opposed to 1(1.8%) of fathers. None of the guardians had high anxiety. Anxiety varied with the educational level of parents/guardians. As educational level increased so did the proportion of those with high anxiety. Those with no education or primary education did not have high anxiety, while those with secondary level of education had 8 (4.8%) with high anxiety and those with tertiary education had 5 (10.2%) with high anxiety. About occupational status caregivers with formal occupation had more anxiety than those with non-formal or those unemployed. The caregivers who had high anxiety were one (0.9%) who was unemployed, 7(4.6%) who had non-formal employment and 5(7.2%) had formal employment, Figure.

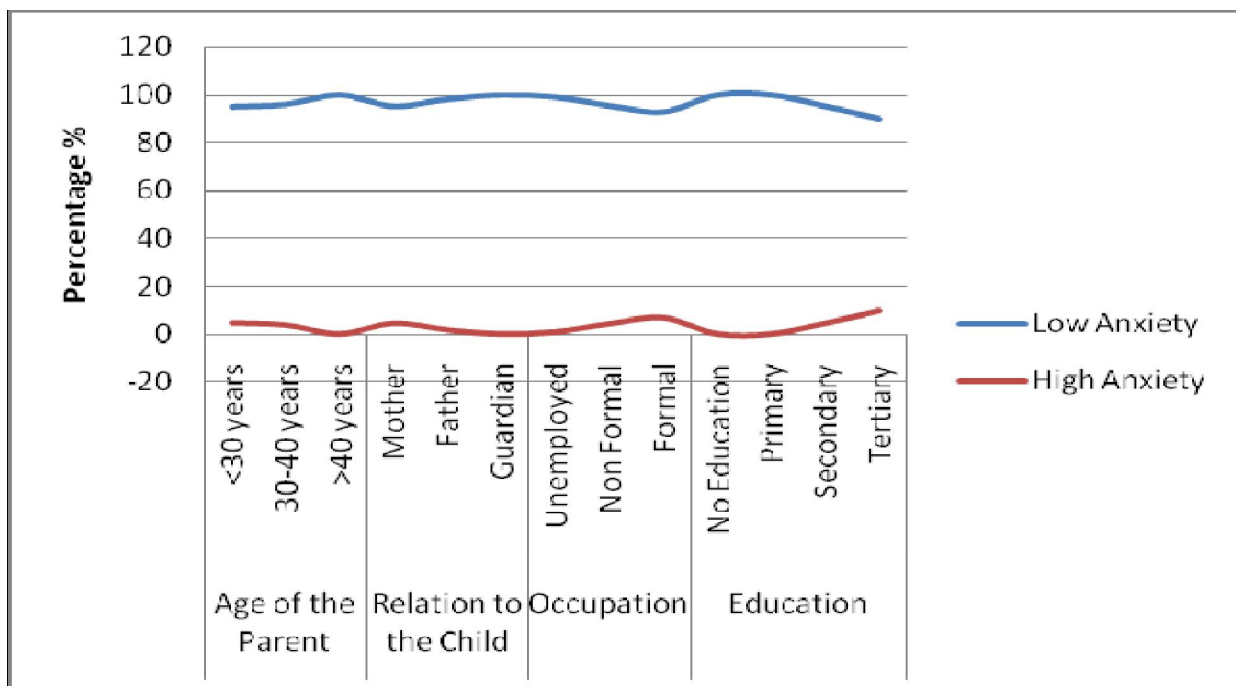


Figure 2: The Parental anxiety about the social demographic variables of the parent

Of the parents/guardians who had visited a dentist before, the majority of 224 (94.9%) had low anxiety while only 12 (5.1%) had high anxiety. Among those who had never visited a dentist before the majority of 93 (98.9%) with low anxiety and only 1 (1.1%) had high anxiety. The finding was not statistically significant ($\chi^2 = 2.87$, d.f 1 and $p=0.09$) as is depicted in Table 1. About previous dental visit experience, those who had had a negative dental experience had more parents 5(6.8%) with high anxiety as opposed to 7(4.3%) who had high anxiety and a positive dental experience. This was not statistically significant ($\chi^2 = 0.70$, d.f 1, $p=0.40$). (Table 1).

| Variable | Number of respondents | Low Anxiety (%) | High Anxiety (%) | Pearson Chi (χ^2) Test |
|-----------------------------|-----------------------|-----------------|------------------|-------------------------------|
| Previous visit to a dentist | Yes (n=236) | 94.9% | 5.1% | $\chi^2=2.87$ $p=0.09$ |
| | No (n=94) | 98.9% | 1.1% | |
| Past Dental Experience | Positive (n=163) | 95.7% | 4.3% | $\chi^2=0.70$ $p=0.40$ |
| | Negative (n=73) | 93.2% | 6.8% | |

Table 1: The pattern of parental/guardian anxiety according to previous clinical experience

The parents who rated themselves as having low anxiety 141(100%) had low anxiety on the investigation. On the other hand, those who rated themselves to have high anxiety only 28(84.8%) had low anxiety, and 5(15.2%) had high anxiety on the investigation. This was statistically significant since $\chi^2 = 17.33$, d.f 2 and $p=0.00$. (Table 2)

| Variable | Number of respondents | Low Anxiety (%) | High Anxiety (%) | Pearson Chi (χ^2) Test |
|---------------------------------|-----------------------|-----------------|------------------|-------------------------------|
| Self-Rating of parental anxiety | Low (n=141) | 100.0% | 0.0% | $\chi^2=17.33$ $p=0.00$ |
| | Medium (n=156) | 94.9% | 5.1% | |
| | High (n=33) | 84.8% | 15.2% | |

Table 2: Parental anxiety when self-rating of own anxiety

There was a total of 330 children, and an equal number of parents/guardians were involved in the study, and only 21 (6.4%) were caries free. Hence the overall caries prevalence was (94%). When the caries prevalence was considered by age group, the prevalence of caries among the 3-year-olds was (95.5%), while among 4-year-olds caries prevalence was (97.5%) and the 5-year-olds had a prevalence of (90.5%).

The mean decayed component was highest amongst the 3-year-olds at 8.55 and lowest among the 5-year-olds at 6.47. The five-year-olds had the most missing mean component of 0.80 as opposed to the 3-year-olds that had the least of 0.55. Whereas regarding the mean filled part the 3 and 4-year-olds had the highest mean of 0.09 and the five-year-olds the least mean of 0.03. The differences in the mean dmft by age group were statistically significant with a Kruskal Wallis, Chi-square =5.94, d.f 2; $p=0.01$ at 95% CL. (Table 3.)

| Variable | (N) | Decayed Mean | Missing Mean | Filled Mean | Dmft Mean | Kruskal Wallis Test |
|----------|-----|--------------|--------------|-------------|-----------|---------------------------|
| Age | | | | | | $\chi^2=5.94$ $p=0.01$ |
| 3 yrs | 44 | 8.55 | 0.55 | 0.09 | 9.16 | |
| 4 yrs | 118 | 7.94 | 0.81 | 0.09 | 8.84 | |
| 5 yrs | 168 | 6.47 | 0.86 | 0.03 | 7.38 | |
| Total | 330 | 7.27 | 0.80 | 0.06 | 8.14 | |

Table 3: Mean dmft according to age

The Boys had a lower prevalence of (93.1%) compared to girls who had a caries prevalence 94.2%. The mean dmft of the children examined was 8.14 ± 5.34 . There was a decrease of mean dmft with an increase in age among 3, 4 and 5-year-olds which was 9.16 ± 5.59 , 8.84 ± 5.59 and 7.38 ± 5.02 respectively. In this study, the boys had a higher dmft mean of 8.32 ± 5.56 than girls whose dmft mean was 7.94 ± 5.12 , Figure 2. The mean decayed component in boys was 7.48, and a lower mean of 7.04 was in girls. The missing mean component was similar to the boys and the girls at 0.80. However, the girls had a higher mean filled portion of 0.77 in comparison to that of boys which were 0.46 and this difference was not significant Mann Whitney U, $Z=13170$ df 1, $p=0.64$ ($p \leq 0.05$). (Fig.3)

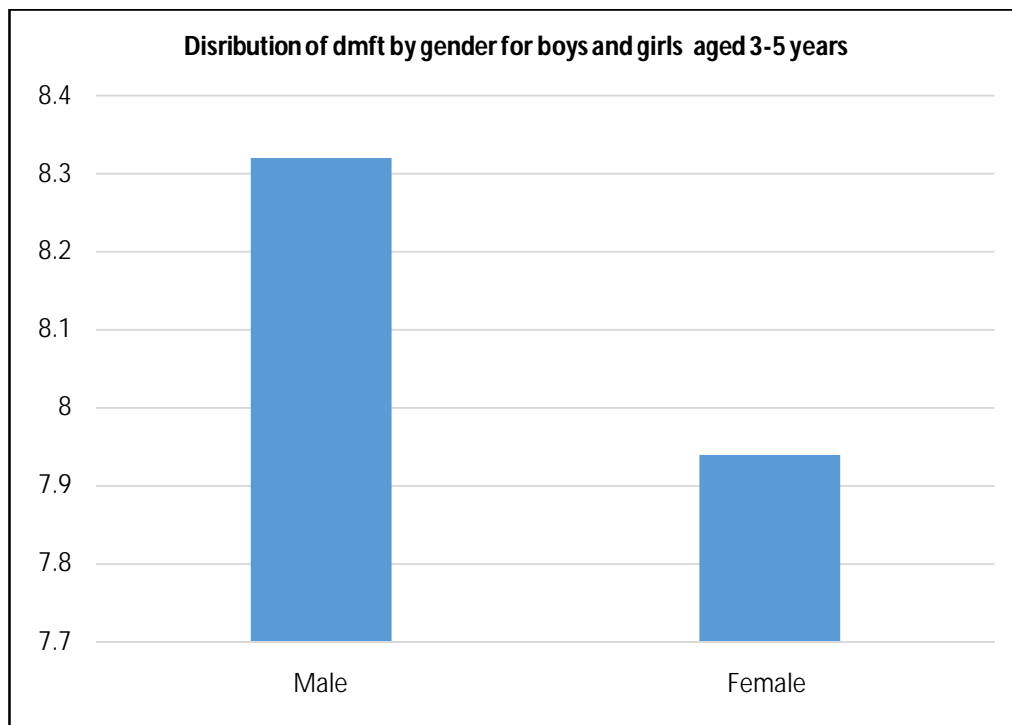


Figure 3: The mean dmft by gender of the children

There was an increase in child dmft when the parent/guardian anxiety became more severe. Parents/guardians with low anxiety their children had the lowest dmft of 8.10 ± 5.36 while those parents with high anxiety their children had highest dmft of 9.08 ± 5.30 . The mean decayed component was lower at 7.25 in children whose parents had low anxiety as opposed to those with high anxiety with a mean of 7.77. The mean missing portion was below 0.77 in children whose parents had high anxiety and 0.80 in parents with low anxiety. The mean filled component was also small at 0.04 in children whose parents had low anxiety as compared to 0.54 in parents with high anxiety. However, there was no statistically significant difference with a Mann Whitney U, $Z = 1788$, d.f 2, $p = 0.42$ ($p \leq 0.05$). (Table 4.)

| Variable | (N) | decayed mean | missing mean | filled mean | mean dmft | Mann Whitney U Test |
|------------------|-----|--------------|--------------|-------------|-----------|---------------------|
| Parental Anxiety | | | | | | |
| Low | 317 | 7.25 | 0.80 | 0.04 | 8.10 | U=1788 p=0.42 |
| High | 13 | 7.77 | 0.77 | 0.54 | 9.08 | |

Table 4: Caries Experience and parental anxiety

There were more parents with previous negative experiences, and their children had higher mean dmft 8.68 ± 5.42 as compared to those with a past positive experience whose children had a dmft mean of 7.83 (± 5.10 Figure 4). It was noted that parents who had past negative dental experiences had children with a higher mean decayed component of 7.86, a high mean missing part of 0.74 and also a high mean filled component of 0.08. However, children of parents with a positive previous dental experience had a slightly lower decayed portion of 7.02, missing 0.73 and filled with 0.07. The aggregate mean dmft was 7.83. The difference in the dmft of children for parents with either a positive or negative past dental experience was not significant with a Mann Whitney U, $Z = 5468$ d.f 1, $p = 0.29$. (Table 5).

| Variable | (N) | decayed mean | missing mean | filled mean | mean dmft | Mann Whitney U Test |
|------------------------|-----|--------------|--------------|-------------|-----------|---------------------|
| Past Dental Experience | | | | | | |
| Positive | 73 | 7.02 | 0.73 | 0.07 | 7.83 | U=5468 p=0.29 |
| Negative | 164 | 7.86 | 0.74 | 0.08 | 8.68 | |

Table 5: Parental previous dental visit experience about the caries experience of the children

3. Discussion

The total prevalence of high anxiety for the parents in this study population was 3.9%. Locker et al. 1999 [xxvii] reported a prevalence of 4.4% while Eli et al. 1992 [ix], published a prevalence of between 6-15% amongst adults. These results were similar to those of this study which reflect that anxiety is a Universal phenomenon but of low prevalence. However, the lower prevalence could also have been as a result of the fact that the parental population was assessed in the clinic which signifies that they ideally have less anxiety since they presented themselves and their children to the clinic without succumbing to their anxiety.

In this study the mean anxiety score of 9.58 for mothers while the fathers had an anxiety mean rating of 7.85. Folayan et al. 2002 [xxviii] in Nigeria reported a mean anxiety score of 9.40 for mothers and a mean score of 8.38 for fathers. The finding was similar to the present study and can be attributed to a similar cultural background between the two African populations. Mothers have been found to have more anxiety, and this has been seen to correspond with the fact that women are significantly more anxious than the males.

Within the mothers interviewed 12 (4.8%) had high anxiety, of the fathers, questioned only 1 (1.8%) had high anxiety and none of the guardians had any high anxiety. In Nigeria, Folayan et al. 2002 [xxviii] reported 7.5% of mothers and 1.2% of fathers having high anxiety. Doerr et al. 1999⁴⁵ in U.S.A [xxix] found a prevalence of 13.8% of females to have high anxiety and 5.6% for male patients. The disparity in distribution in this study from the Nigerian research can be explained by the fact that Folayan et al. 2002⁴⁴ had a smaller sample size of 53 mothers and 35 fathers. Hence, may not have been a representative sample size. Also, the tool of assessment was different since the Dental Anxiety Scale was used as compared to the Modified Dental Anxiety scale in this study. Higher prevalence of U.S.A can be attributed to a higher dental experience exposure in the U.S.A as opposed to our current setup.

The highest proportion of parents with high anxiety 7 (4.0%) was from the 30-40-year-old group which was different to a study by Doerr et al. 1999⁴⁵ in U.S.A [xxix] who found that those with high anxiety fell in the <30 year age group. Local and regional studies could not be found. However, international studies show that the younger groups have the highest dental anxiety. It is the experiences that we obtain at an early stage that becomes an internal representation that affects behaviour as was argued by Bowden in the Attachment Theory [ix]. Locally, the treatment-seeking behaviour is usually at an older age hence the younger population may not be all that exposed to the clinic as the older generation.

The anxiety of the parents/guardians varied among educational level in this study. As educational level increased so did the proportion of those with high anxiety. The relationship between the increase of education and anxiety was different from a U.S.A study [xxix] whereby fewer years of education reflected a higher anxiety prevalence. In our setup, the less educated do not know can be implied to have a lack of adequate dental knowledge and lack of dental practice exposure. The difference inadequate dental knowledge this study is in contrast to U.S.A where the uneducated do have some form of education and may not be necessarily ignorant. Therefore, in our setup more education reduces ignorance hence the anxiety increases, unlike in U.S.A where more knowledge alleviates anxiety as opposed to dental ignorance. Berggren et al. 1984 [xxx] argued that low education creates a social embarrassment to the patient since they are anxious about how to communicate to a highly educated dentist.

Concerning employment status levels anxiety, those who were employed had higher levels of anxiety than those unemployed, with those in the formal employment having had the most anxiety. A similar distribution was also observed with regards to education levels, and it has been found that education was directly related to employment. Studies internationally have not compared anxiety to employment, but have compared it to income earning. Doerr et al. 1999 [29] showed that there was a significant inverse relationship between income and dental anxiety. In our setup employment and education are closely related hence the same argument as that of education applies.

There was a lack of relationship between parental/guardian anxiety with whether they had visited a dentist previously or not. Similarly, there was no relationship between their anxiety and whether they had had a previous negative or positive experience. Similar findings were reported by Heaton et al. 2007 [xxxi] among a female population, whereby they demonstrated that previous experience or expectations did not influence anxiety. The lack of association between previous experience and dental anxiety may be attributed to the fact the dental anxiety is inherent and not dependent on past experiences.

A significant relationship was established between how parents rated their anxiety and to how they actual scored on the anxiety scale. A similar finding was reported by Heaton et al. 2007 [xxxi] where there was a significant association between self-reported and observed measures of dental anxiety, despite an overall low level of anxiety.

The overall prevalence of dental caries in the study population was 93.6% and mean dmft of 8.17. The prevalence of 93.6 is two times higher than the Kenya national prevalence of 46.3% [xxxii] while the dmft in this study was 8.14 in comparison to the national survey reported mean dmft of 1.87 for five-year-olds. Thus in the current research, the caries experience is 4.4 times higher. The difference between the present study and the oral health national survey may be attributed to differences in methods of sampling and the sample size. The present study used convenient sampling including all children whose parents were seeking dental treatment, and this created a bias of high caries prevalence being reported. The national survey they sampled children from urban peri-urban and rural communities. Also, there is a difference in the sample size for five-year-olds were 717 (32.2%) children out of 2279 children aged between 5-15 years who participated in the national survey [xxviii]

However, a recent by Ogada et al. [xxxiii] has reported slightly higher prevalences of 62.7% in a study group 276 children aged 36-59-month-old children with a mean dmft of 3.19 (SD 3.96) which is 2.6 times lower than what we have found in this study. His study was based on a rural setup which explains the difference in prevalence. In Uganda, a prevalence of 64% and a dmft of 1.7 while a prevalence of 94.4% was reported in Saudi Arabia [xxxiv, xxxv, xxxvi, xxxvii].

Prevalence of dental caries among girls at 94.2% was higher than in boys at 93.1% which is similar to findings reported locally and regionally. [xxxviii, xxxix] This could be explained by the fact that girls are more prone to cariogenic foods than boys as a result of their snacking patterns. Also, Kenya girls of African descent have an early eruption of the dentition compared to the boys by up to 10 months [xl]. The early erupting of the teeth may also be a contributory factor since the teeth are exposed for a longer time in the mouth to risk factors.

Notably important was the fact that a significant component of dmft was contributed by a considerable proportion of the decayed portion. There are several reasons which may account for this, ranging from poor public dental awareness, the high cost of dental treatment. A lack of accessible and adequate dental facilities for treatment, and negative attitude towards dental treatment.

Boys had a higher dmft than girls with a mean of 8.32 and 7.95 respectively. The high prevalence observed in the boys contradicts the national oral survey where the dmft for the girls was 1.7 times higher than the boys who had a dmft/DMFT of 0.82 [xxxiii]. The missing component was similar for both boys and girls. However, the girls had a higher mean filled part than the boys. The difference in caries experience between girls and boys may be as a result of socio-cultural factors, whereby girls and their parents may be more meticulous in their hygiene and thus better oral care. Girls also mature earlier than boys and usually attain a higher level of responsibility.

As the children grew older the caries experience differed among the age groups, with a general decrease in the dmft mean. The 5-year-olds had the lowest mean in the filled component and the highest mean missing part than the 3 and 4-year-olds. In the current study, this was statistically significant. The difference between the filled and missing portions was, however, different from previous studies where the trend is to have an increase in dmft as the age increases [xxxviii]. The rise in dmft could also be as a result of the disproportionate distribution of children among the age groups. There were more children in the 5-year old age group as compared to the minority in the 3-year-old age group. Thus, this distribution would give bias to the fewer 3-year-olds making them seem to have a higher dmft score.

In the current study parents that had low anxiety had children with the least dmft score. The decayed was higher in children whose parents had high anxiety and also had a higher filled component than those of parents with low anxiety. Lahti et al. found that a higher level of parental dental anxiety was found among caries-active children [xxiv]. The higher level of parental anxiety has been associated with active caries in their children, and this finding was not observed in this study. The reason it may not have been significant that in this study sample population had very few parents who were representative of high parental anxiety.

Similarly, parents who had had negative dental experiences had children with highest dmft scores, mean decayed component, mean missing part and mean filled the part. It is this same parent with previous negative experiences that significantly higher dental anxiety. This situation is similar to that of Lahti et al. since those with past negative anxiety were those with high parental anxiety [xxiv].

Parents with low anxiety would be more likely to bring their children for a regular dental checkup compared to the parent with high anxiety. The children who are brought in for dental checks will be more likely to develop positive behaviour towards dental procedures and also have preventive procedures done as well as have the early treatment done. Parents with high anxiety can transmit this to their children. In turn, they will have negative behaviour are challenging to treat, and thus the caries experience will be to a more significant extent. Such children when not carefully handled so that they can deal with their fears and develop low anxiety, they may end up as parents with high anxiety in future, and this becomes a vicious circle.

4. Conclusion

The percentage of parents/guardians affected by high dental anxiety was 3.9% it was also observed that they were able to predict their anxiety accurately.

There was a high dmft score of the children of 8.14 with the decay (d) component contributing a higher proportion of 7.27. The missing part was 0.80, and there was a low filled component of 0.06 which showed unmet treatment needs. Child caries significantly reduced with age of the children. However, there was no association between parental/guardian anxiety and dental caries experience of the child.

5. Limitations

The study was conducted in a hospital setting may have made the anxiety of the parents to be altered. No radiographs were taken, and visual examination has been documented to report 35% decay only. Hence this may have led to a report in low caries prevalence and experience when the caries experience was high.

The parents though anxious may not have exhibited anxious behaviour due to cultural expectations where caregivers are expected to be brave in the presence of a healthcare provider. By the parents/ guardians trying to be brave when they are anxious could have resulted in low false reporting of on caregiver levels of anxiety.

6. References

- i. Beck AT, Emery G, Greenberg RL. Anxiety disorders and phobias: A cognitive perspective. Basic Books. 2005.
- ii. APA Diagnostic and Statistical Manual of Mental Disorders: DSM-IV, 4th edn. Washington DC: American Psychiatric Association, 1994.
- iii. Folayan M. O, Ide hen E. E, Ojo O. O. The modulating effect of culture on the expression of dental anxiety in children: a literature review. *International Journal of Paediatric Dentistry*. 2000; 14: 241–245.
- iv. Armfield J.M, Spencer A.J, Stewart J.F. Dental Fear in Australia: Who's afraid of the dentist? *Australian Dental Journal*. 2006; 51: 78-85.
- v. Al-Khodair I, Al-Balawi S, Al-Khamis H, Marks I. Dental phobia among Saudis. *Anxiety*.1996; 2: 140-144
- vi. Locker D, Liddell A, Dempster L, Shapiro D. Age of Onset of Dental Anxiety. *J Dent Res*. 1999; 78: 790-796.
- vii. Firat D, Tunc E.P, SAR V. Dental Anxiety among Adults in Turkey. *J Contemp Dent Pract*. 2006; 3: 75-82.
- viii. Willershausen B, Azrak A, Wilms S. Fear of dental treatments and its possible effect on oral health. *European Journal of Medical Research*. 1999; 4: 72-77.
- ix. Eli, I; Uziel N, Blumensohn R, Baht R. Modulation of dental anxiety — the role of past experiences, psychopathologic traits and individual attachment patterns. *British Dental Journal*. 2004; 194: 689–694.
- x. Yamada M.K, Tanabe Y, Sano T, Noda T. Cooperation during dental treatment: The Children's Fear Survey Schedule in Japanese children. *International Journal of Paediatric Dentistry*. 2002; 12: 404-409.
- xi. Wakiaga J. M, Kaimenyi J, Kisumbi B. K. Reasons underlying failure to seek dental treatment among University of Nairobi Students *East African Medical Journal*.1996; 73: 320-326.
- xii. Al-Khodair I, Al-Balawi S, Al-Khamis H, Marks I. Dental phobia among Saudis. *Anxiety*.1996; 2: 140-144.
- xiii. Locker D, Liddell A, Dempster L, Shapiro D. Age of Onset of Dental Anxiety. *J Dent Res*. 1999; 78: 790-796.
- xiv. Klinberg G, Berggren U, Carlsson S.G, Noren J.G. Child dental fear, cause-related factors and clinical effects. *Eur J Oral Sci*. 1995; 103: 405-412.
- xv. Mathewson, R. J., Primosch, R. E. And Robertson, D. (1987): *Fundamentals of Paediatric Dentistry*. Quintessence Publishing Co Inc. pg. 137-152.
- xvi. Bankole O. O, Denloye O. O, Aderinokun G. A. The effect of mother's past dental Experience on the behaviour of some Nigerian children during dental treatment. *African Journal of Biomedical Research*. 2004; 7: 113 -118
- xvii. Effect Of Parental Anxiety On Child Behaviour In The ..., <http://www.jkcd.org.pk/Issues/2013-2/KCD-6.pdf> (accessed November 30, 2017). 2004; 62: 207-213
- xviii. Cohen S. M, Fiske J, Newton J.T. The impact of dental anxiety on daily living. *BDJ*. 2000; 189: 385-390.
- xix. Colman M, Raman B. The association between dental anxiety and oral health-related quality of life in Britain. *Community Dentistry and Oral Epidemiology*. 2004; 32: 67 -72
- xx. Milsom K.M, Tickle M, Humphris G.M, Blinkhorn A.S. Is childhood dental anxiety a result of irregular attendance? *British Dental Journal*. 2003; 194: 495-498.
- xxi. Milsom K.M, Tickle M, Humphris G.M, Blinkhorn A.S. The relationship between anxiety and dental treatment experience in 5-year-old children. *British Dental Journal*. 2003; 194: 503-506.
- xxii. Giron M.C.C. *Fundamentos psicológicos da prática odontológica*. Porto Alegre: D.C. Luzzatto. 1988; 17: 7-9.
- xxiii. Shabnam G. K, Ruchi A, Altaf H. S, Amjad W, Anshu S. Maternal Dental Anxiety and its Effect on Caries Experience among Children in Udaipur, India. *J Clin Diagn Res*. 2015 Jun; 9(6): 42–45.
- xxiv. Lahti S, Tutti H, Honkala E. The relationship of parental dental anxiety and child's caries status. *ASDC J Dent Child*. 1989; 56: 191-195.
- xxv. Smyth, J.S. A programme for the treatment of severe dental fear. Report of three cases. *Australian Dental Journal*. 1999; 44: 275-278.
- xxvi. Bankole O.O, Denloye O.O, Aderinokun G.A, Jeboda S.O. The relationship of children's predicted behaviour to their observed behaviour during dental procedures. *African Journal of Biomedical Research*. 2002; 5: 109-113.
- xxvii. Locker D, Liddell, A., Dempster, L, Shapiro, D. Age of Onset of Dental Anxiety. *J Dent Res*. 1999; 78: 790-796.
- xxviii. Folayan M, Adekoya-Soforowa C.A, Otuyemi O.D, Ufomata D. Parental anxiety as a possible predisposing factor to child dental anxiety in patients seen in a suburban dental hospital in Nigeria. *International Journal of Paediatric Dentistry*. 2002; 12: 255–259.
- xxix. Doerr P, Lang W.P, Nyquist L.V, Ronis D.L. Factors associated with dental anxiety. *JADA* 1999; 129: 1111-1119.
- xxx. Berggren U, Meynert G. Dental fear and avoidance: causes, symptoms, and consequences. *J Am Dent Assoc*. 1984; 109: 247-51.
- xxxi. Heaton L.J, Carlson C.R, and Smith T.A, Baer R.A. Predicting anxiety during dental treatment using patients self-reports: Less is more. *JADA*. 2007; 138: 188-195.
- xxxii. Ministry of health Kenya National Oral Health Survey Report: November 2015.
- xxxiii. Ogada A, Ngatia E, and Muasya M. Nutritional Status and Dental Caries Experience among 36-59-Months-Old in Kiambu Kenya. *IJIRD* 2017; 6: 1-5.
- xxxiv. Kiwanuka S.N, Astrom A.N and Trovic T.A. Dental caries experience and its relationship to social and behavioral factors among 3-5-year old children in Uganda. *Int J Paed Dent*. 2004; 14: 336-346

- xxxv. Kiwanuka S.N. Sugar snack consumption, caries experience and dental pain surveys of 3-5-and 10-14-year-old children in Uganda. A thesis 2006.
- xxxvi. Wyne A.H, Al-Ghorabi B.M, Al-Asiri Y.A, Khan N.B. Caries prevalence in Saudi primary school children of Riyadh and their teachers' oral health knowledge, attitude and practices. Saudi Med J. 2002; 23:77-81.
- xxxvii. Paul T.R. Dental health status and caries pattern of preschool children in Al-Kharj, Saudi Arabia. Saudi Med J. 2003; 24: 1347-51.
- xxxviii. Ngatia E.M, Imungi J.K, Muita J.W, Ng'ang'a P.M. Dietary patterns and dental caries in nursery school children in Nairobi, Kenya. E Afr Med J. 2001; 78: 673-677.
- xxxix. Masiga M, Holt R. The prevalence of dental caries and gingivitis and their relationship to social, economic class amongst nursery school children in Nairobi Kenya. Int J of Paed Dent. 1993; 3: 135-140.
- xl. Hassanali J, Odhiambo J.W. Ages of the eruption of permanent teeth in Kenyan African Asian children. The Annals of human biology. 1981; 8: 425-431.