

**INFLUENCE OF PARENTAL ANXIETY ON CHILDREN'S  
BEHAVIOUR DURING DENTAL TREATMENT IN RELATION TO  
THE CARIES EXPERIENCE AMONG 3-5-YEARS-OLDS IN THREE  
PUBLIC DENTAL CLINICS IN NAIROBI**

**NICHOLAS GICHU [BDS, NBI]    V60/7594/06**

**DEPARTMENT OF PAEDIATRIC DENTISTRY & ORTHODONTICS, SCHOOL  
OF DENTAL SCIENCES, COLLEGE OF HEALTH SCIENCES, UNIVERSITY  
OF NAIROBI.**

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UNIVERSITY OF NAIROBI.**

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**DECLARATION**

I declare that this thesis is my original work and has not been presented for the award of a degree in any other university.

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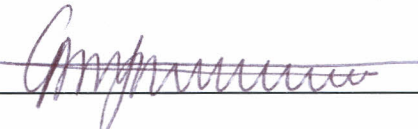
NICHOLAS GICHU [BDS, NBI]

## APPROVAL

This thesis has been submitted with our approval as University Of Nairobi supervisors.

## SUPERVISORS

**GLADYS N OPINYA**, BDS [NBI], CAGS, MSC.D [BOSTON USA]; PHD [NBI.]  
PROFESSOR OF PAEDIATRIC DENTISTRY; DEPARTMENT OF PAEDIATRIC  
DENTISTRY & ORTHODONTICS. SCHOOL OF DENTAL SCIENCES.  
COLLEGE OF HEALTH SCIENCES, UNIVERSITY OF NAIROBI

Signed:  Date: 21-10-2009

**EDITH NGATIA**, BDS [NBI], MSC [NBI]  
LECTURER, HUMAN NUTRITION, DEPARTMENT OF PAEDIATRIC  
DENTISTRY & ORTHODONTICS. SCHOOL OF DENTAL SCIENCES.  
COLLEGE OF HEALTH SCIENCES, UNIVERSITY OF NAIROBI

Signed:  Date: 21/10/2009

**LOICE GATHECE**, BDS [NBI], MPH [NBI]  
SENIOR LECTURER, COMMUNITY HEALTH, DEPARTMENT OF  
PERIODONTOLOGY, COMMUNITY & PREVENTIVE DENTISTRY. SCHOOL  
OF DENTAL SCIENCES. COLLEGE OF HEALTH SCIENCES, UNIVERSITY OF  
NAIROBI

Signed:  Date: 21/10/09.

## **DEDICATION**

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## DEFINITIONS OF TERMS

Dental Caries – Infectious microbiological disease that results in the demineralization of the inorganic component and destruction of the inorganic component of teeth.

Caries experience – Measured by determining the score of children with decayed, missing or filled teeth.

Frankl Scale - A scale that rates children's reaction behaviour to dental treatment.

Modified Dental Anxiety Scale – A scale that measures dental anxiety.

Parental Anxiety- A feeling of dread or worry by the parent prior to exposure to a feared dental stimulus.

Poor Behaviour- Negative behaviour by the child during treatment that is disruptive, either prolonging treatment or preventing treatment to be rendered.

## ACRONYMS

$\chi^2$  – Chi Square

d.f- degrees of freedom

dmft- decayed, missing, filled, teeth

KNH- Kenyatta National Hospital

MDS- Master of Dental Surgery

OPD- Out Patient Clinic

SD- Standard Deviation

SPSS- Statistical Package for Social Sciences

UON- University of Nairobi

WHO- World Health Organization

## ABSTRACT

**Background:** Dental anxiety is a fear traditionally defined as an irrational and exaggerated fear of dentists and dental procedures. It is a worldwide phenomenon with a prevalence ranging from 3-43%. Females have been known to have higher anxiety than males and the younger age groups also have higher anxiety than the older age groups. Anxious parents might incorporate this anxiety onto their children and this can manifest as poor behaviour of the child during dental treatment. Also, anxious parents might present their children late to the clinic as a result of their own fear and this can predispose the children to a high caries experience.

**Objective:** To determine the influence of parental anxiety on child behaviour during treatment in relation to the child caries experience among the 3-5-year-olds.

**Study Design:** This was a descriptive cross-sectional study.

**Study Area:** Using purposive sampling, three public dental clinics in Nairobi were selected, namely, Kenyatta National Hospital, the University of Nairobi, School of Dental Sciences, and the Lady Northey City Council Clinic.

**Methods and Materials:** All patients who met the inclusion criteria during the duration of the study were included, and this involved a total of 330 children aged between 3-5-years of age and their accompanying parents/guardians. A semi-structured questionnaire was used to obtain information on the parent/guardian on previous clinical experiences for themselves and the children. The Modified Dental Anxiety Scale was used to determine parental anxiety and child behaviour

was measured using the Frankl Scale and recorded in a clinical examination form. Children were examined for dental caries experience using the WHO Criteria 1997 (dmft) and the caries experience recorded in a clinical examination form.

**Data analysis and presentation:** The data collected was coded, and analyzed using the statistical package for social sciences [SPSS] 12.0[SPSS Inc, Chicago, Illinois, USA.] Results were presented using charts, graphs and tables. Chi-square ( $\chi^2$ ) test was used to determine the relationship between variables for the categorical data. Mann Whitney U Rank test was used to determine relationship between non-categorical variables. A P-value of less than 0.05 was considered significant. Descriptive analysis was done using frequencies for various variables.

**Results:** Overall prevalence of high anxiety was 3.9%. Among those with high anxiety 12 (92.3%) were mothers, 1 (7.7%) were fathers and none of the guardians had any high anxiety. There was no relationship between parental anxiety and previous clinical experience ( $p=0.40$ ). Similarly, there was no relationship between parental/guardian anxiety and history of previously visiting a dentist or not was obtained ( $p=0.09$ ). Parents/guardians were accurately able to rate their own anxiety correctly ( $p=0.00$ ).

'Definitely negative' behaviour was observed among 33 (10%) of the children, while 94 (28.5%) had 'negative' behaviour, 108 (32.7%) had 'positive' behaviour and 95 (28.8%) had 'definitely positive' behaviour. There was no relationship between child behaviour and previous clinical experience of the parent/guardian ( $p=0.21$ ). The older children were significantly better behaved than the younger children ( $p=0.04$ ). There was a significant relationship between child behaviour

exhibited and previous clinical experience of the child ( $p=0.004$ ). However, there was no relationship between behaviour exhibited by the children and previous history of visiting a dentist ( $p=0.21$ ). Parents/guardians were accurately able to predict the behaviour of their children in the clinic ( $p=0.00$ ).

Prevalence of dental caries was 93.6% and a mean dmft of 8.14. There was a high proportion of unmet treatment needs with a mean decayed component of 7.27, mean missing component of 0.80 and a mean filled component of 0.06. There was a significant increase in caries experience with increase in age ( $p=0.01$ ). There was no association between parental/guardian anxiety and child behaviour ( $p=0.08$ ). Similarly there was no association between parental anxiety and caries experience of the child ( $p=0.42$ ). Also, there was no association between child behaviour and child dental caries experience ( $p=0.21$ ).

**CONCLUSIONS:** The overall prevalence of high dental anxiety was low but parents/guardians were accurately able to predict their own anxiety. Majority of the children had positive behaviour and their behaviour was significantly related to the age. Parents are able to accurately predict the behaviour of their children, and the same behaviour was also significantly related to previous clinical experience of the child. There was a high dmft score for the children of 8.14 with a high unmet treatment with the decay (d) component contributing the biggest portion with a very low filled component of 0.06. There was no association between parental/guardian anxiety and child behaviour or dental caries experience of the child.



**RECOMMENDATIONS:** In spite of low parental anxiety there was still a large proportion of children with negative child behaviour signifying that other factors were influencing negative child behaviour. Hence the need to conduct further research to elicit factors negfative child behaviour in children. In addition a study would be essential to survey the parental anxiety in the Kenyan population as opposed to the hospital setup.

The proportion of unmet needs as was represented by the 'd' component was high, thus the need for implementation of strategies targeting promotion, prevention and early treatment of dental caries in children. It is also necessary to conduct further research to elicit factors influencing high unmet treatment needs in children with caries experience.

## CHAPTER ONE

### INTRODUCTION

Dental treatment phobia is a fear traditionally defined as an irrational and exaggerated fear of dentists and dental procedures. It has also been referred to as odontophobia, dentophobia, dentist phobia or dental anxiety. Some controversy exists with regard to whether the fear is "irrational", as dental phobia is most commonly caused by previous bad experiences. Furthermore, there appears to be several subtypes of dental phobia, which to date have not been adequately described and categorized, for example "fear of dentists" versus "fear of specific dental procedures", needle phobia, and dental phobia resulting from previous, perhaps unrelated abuse.<sup>1</sup>

Fear and anxiety are highly interchangeable terms. Fear is generally regarded as a physiological, behavioural and emotional response to a feared dental stimulus. Whilst anxiety is a feeling of dread or worry focused on, yet temporarily prior to, exposure to the feared stimulus. The main difference between severe dental fear and dental phobia is related to the impact it has on normal functioning. In order to be classified as a phobia, the avoidance, anxious anticipation or distress in the feared situation have to interfere significantly with the person's normal routine, occupational (or academic) functioning, or social activities or relationships, or there has to be a marked distress about having the phobia.<sup>1</sup>

The prevalence of fear has been found to vary in content, pattern and level of fear across different cultures and across different populations.<sup>2</sup> A worldwide prevalence of 3-43% for child dental fear has been reported.<sup>3</sup> Firat et al. 2006<sup>4</sup>

found a prevalence of 21% Turkish adults, whilst Folayan et al. in Nigeria reported prevalence of 7.5% and 1.5% in mothers and fathers respectively.<sup>3</sup> Consistent findings show that greatest prevalence of high dental fear occurred for people who were female, in middle adulthood, from low socioeconomic circumstances, who were dentate, visited the dentist less often and who had fewer remaining teeth.<sup>2</sup> Younger people are also found to be more anxious than the older age group.

Reasons for the development of dental anxiety are still undefined. However, three main aspects have been suggested: (i) direct conditioning, which originates in early, aversive encounters in the dental office (ii) vicarious learning, through role models, such as family, peers and society and (iii) psychodynamic and personality aspects, i.e. specific traits that when present, increase the patient's proneness for apprehension in the dental setting.<sup>5</sup>

Since dental anxiety is complex 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 main cause in the development of dental anxiety.<sup>5</sup>

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,<sup>6</sup> horrific stories from friends about traumatic experiences, the cost of treatment and risk of cross infection especially to HIV infection.<sup>7</sup>

A study by Colman et al. in 2004 showed that those experiencing high levels of dental anxiety were among those with the poorest oral health.<sup>8</sup> 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 present their children late to the clinic as a result of their own fear.<sup>9,10</sup>

These paediatric patients have been noted to be requiring extractions because of delayed presentation and in the case of follow-up treatment the patients are found to be sporadic attendants.<sup>9,10</sup> In Sweden it has been shown that from parents with severe dental fear, 45% of their children had behaviour problems, high DMFT scores and a high frequency of missed or cancelled appointments.<sup>11</sup> Lahti et al. 1999<sup>12</sup> also found that a higher level of parental dental anxiety was found among caries-active children.

Anxiety in parents, especially overly involved mothers, have been shown to be associated with anxiety being reflected in the children.<sup>13,14,15</sup> The common cause of poor behaviour in the dental clinic is usually dental anxiety. Incorporation of attitudes and behaviour patterns from parents and siblings is common. Misbehaviour may stem from the family unit via behaviour contagion.<sup>13</sup> This signifies that negative behavior in the clinic can be passed on from one family member to another. As a result fearful patients will arise from families that have previous unfavorable experiences and from families that outwardly express their attitude.<sup>14</sup>

Mothers, especially, have been shown to have the most influence on a child's behaviour and psychological development. Depending on the mother's previous dental experience, her attitude and anxiety levels have been shown to have a direct influence on the child's attitude and anxiety levels. A mother who bears anxiety as a result of her own previous dental experience will transmit to her offspring which will produce a dental phobia towards dental treatment with a child having his/her own preconceived misconceptions.<sup>14</sup> Therefore; parental anxiety affects the behaviour of the child during dental treatment and ability of the child to cope.<sup>16</sup>

## LITERATURE REVIEW

The experience of anxiety is a universal human phenomenon. Studies have shown a worldwide prevalence of dental anxiety to vary between of 3-43%.<sup>3</sup> An Australian study showed that the prevalence of dental fear was 16.1%, with the same study reporting higher levels of dental anxiety among females than in males.<sup>2</sup> In Saudi Arabia levels of dental anxiety have been reported in 5% of all dental clinic attenders<sup>15</sup> whilst in Toronto the prevalence in the population was 16.4%.<sup>13</sup> Eli et al. 2002 also reported a variation in prevalence of 6-15%.<sup>17</sup> The reported age of onset of anxiety was as follows: 50.9% reported onset in childhood, 22.0% in adolescence, and 27.1% in adulthood.<sup>13</sup>

Anxiety has aetiological factors that are both numerous and complex. Noise and vibration of the drill, the sight of the injection needle and sitting in the dental chair have been reported as particularly fear provoking.<sup>18</sup> Most often than none, fear of pain appears to be the most important predictor of dental anxiety.<sup>19</sup>

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 important reasons found to keep some adults from visiting a dentist.<sup>7,20</sup> To buttress this assertion, dental patients who are fearful have been found 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 greater family history of dental phobia.<sup>15</sup> Research carried out, similarly revealed that a family history of dental anxiety was predictive of dental fear in children.<sup>13</sup>

Even though all the members of the family are important in influencing the behaviour of the child, the mother appears to be the most influential family member. Observations by researchers have revealed that children with high dental anxiety had mothers who had previous negative dental experiences and were scared of dental treatment.<sup>14,21</sup> A mother will transmit her anxiety to her offspring.<sup>22</sup> Therefore, maternal dental fear is an important aetiological factor in the development of dental fear in children.<sup>14</sup> Mothers can tend to have a negative attitude as a result of high levels of ignorance and unawareness. Such as has been reported in Nigeria where 63.7% of mothers had never attended a dental clinic.<sup>23</sup> Among the 6-year-olds, father's education positively modified the effect of a child's caries experience and child dental fear.<sup>24</sup>

Dental anxiety has wide ranging effects on the lives of individuals who are dentally phobic. The impact of dental anxiety is manifest in five ways: physiological disturbance; behavioural changes; cognitive changes; changes in health; and disruption of social roles. The nature of the impact of dental anxiety varies at different times. The impact is greatest immediately before and on the day of the dental appointment.<sup>25</sup>

Dental anxiety has been associated with the impact oral health has on life quality. The impact that dental anxiety can have on people's lives is wide-ranging and dynamic. Physiological impacts include signs and symptoms of the fright response and feelings of exhaustion after a dental appointment. Cognitive impacts include an array of negative thoughts, beliefs and fears. Behavioural impacts include not only avoidance, but other 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.<sup>25</sup>

Anxiety has been related to avoidance of or flight from dental treatment, even when treatment is extremely necessary, thus affecting the oral health of the individual. However, paediatric patients sometimes have no choice or say in the matter and are taken by their parents. These patients will manifest their fear by crying and screaming, refusing to open their mouths, kicking and throwing up to avoid receiving treatment.<sup>26</sup> This compromises on the quality and quantity of treatment by the dentist. Patients who experience stress can present aggressive behaviour to relieve anxiety. This manifestation of stress, and behaviour and emotional problems in children requiring physical restraint can cause intense anxiety manifestations leading to difficulty for paediatric dental treatment.

In the North West of England a study involving 5-year-olds revealed that anxious children were more likely have anxious parents. These same children with anxious parents were sporadic irregular attenders, who presented regularly with symptomatic presentation of pain and had undergone dental extraction in the past.<sup>9,10</sup> Lahti et al.<sup>12</sup> demonstrated that parents with dental anxiety had children who were caries active. Children with high anxiety in addition have also been reported to have a higher caries risk. A study among 12-14-year-olds found a significant correlation between the level of the fear and anxiety and the number of the untreated or extracted tooth. Children with a high dental anxiety were 62% more likely to have had at least 1 missing tooth due to caries.<sup>27</sup> Individuals with high dental fear had a statistically significantly higher number of decayed surfaces (DS), decayed teeth, (DT) and missing teeth (MT) but a statistically



significantly lower number of filled surfaces (FS), filled teeth (FT), functional surfaces (FSS), and functional teeth (FST).<sup>28</sup> Meanwhile another study reports that 6 and 12-year-olds who had experienced caries were more likely to report dental fear than were caries-free children.<sup>24</sup>

Common cause of poor behaviour in the dental clinic is usually dental anxiety. Negative behaviour has been observed in children who had interacted with someone with an unpleasant dental experience.<sup>29</sup> In Nigeria, it was revealed that the mothers' past dental experiences was found to influence the children's behaviour at the initial steps of treatment. On entering the operator, 92.5% of the children whose mothers had pleasant memories of their dental experiences reacted positively in comparison to 60% who had mothers with previous traumatic experiences.<sup>30</sup> Behaviour in the latter stages of treatment has a tendency towards good behaviour in mothers who had previous pleasurable experiences. Rodrigues et al. in 1996 India found that maternal anxiety was a significant factor in negative child behaviour.<sup>31</sup> In addition, a significant relationship between the levels of maternal anxiety and the behaviour of children during the first dental visit among 3-12 year olds.<sup>32</sup>

A Nigerian study revealed a high association between the level of pre-existing dental anxiety in the children and their behaviour during various phases of treatment. During the initial stages of treatment, prophylaxis, administration of local anaesthesia and tooth extraction, children with a high level of anxiety were less cooperative. In addition, a general tendency towards cooperative behaviour was observed among patients whose mothers had low anxiety levels. This study shows the importance of correct assessment of the pre-operative dental anxiety

status in children as well as the level of anxiety in their mothers. The level of dental anxiety in children and their mothers appears to be predictive of their behaviour in the oral care setting. In circumstances where the level of pre-operative and maternal anxiety are high, efforts should first be geared towards instituting appropriate behaviour management skills like behaviour shaping and modelling to bring about a higher level of cooperation before embarking on treatment.<sup>23</sup>

Many workers have found that, to a certain extent, mothers are able to predict correctly the behaviour of their children in the dental clinic.<sup>11,29,33</sup> The findings in these studies have also shown that there is a direct association between the predicted behaviour of the child and actual manifested behaviour during dental appointments.<sup>33</sup> It was observed that more negative behaviour was displayed in children whose mothers predicted would behave poorly. This association was noticed at the preliminary stages of treatment, during prophylaxis, administration of local anaesthesia and extraction. The same tendency was observed during restorative procedures. Literature has revealed that in certain circumstances doctors have been able to envisage anxiety in some patients and to some extent predict the probable outcome of their behaviour.<sup>34</sup> In a similar manner, mothers have been demonstrated to be capable of correctly predicting their children's behaviour to a large extent.<sup>29</sup>

Parental anxiety can lead to poor child behaviour and a poor ability of the child to cope during dental treatment.<sup>16,30,31</sup> This poor behaviour compromises on treatment by the dentist. Abrasive misbehaviour maybe misconstrued by both dentist and parent as a sign of unruliness which may not be the case. These

fears not only disrupt the performance of clinical procedures, they also tend to undermine the relationship between dentist and the child patient.<sup>35</sup> Ultimately the dental health of the child is affected and they can have a higher caries activity. It is very important to establish a healthy Dentist-Patient relationship initially so as to establish a positive attitude in terms of behaviour management for the child.<sup>36</sup> If this fear is not addressed it tends to persist into adulthood thus leading to an increase in frequency of missed or cancelled appointments and patients making only emergency dental visits.<sup>37</sup>

Given both 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 in terms of both fear identification and treatment. In addition, studies on parental anxiety and child behaviour have not been carried out in Kenya. It is important that dentists and allied staff anticipate and are trained to identify anxious parents and patients. Following identification a fearful patient may require extra or special measures to ensure successful completion of a course of care. Such measures may involve providing extra control in relation to the dental procedures, providing more information, taking breaks during the procedures and use of distraction techniques.

## **RESEARCH PROBLEM**

### **Statement of the Problem**

Despite advances in both pain control and patient management, dental anxiety remains a serious issue for patients and dental clinicians. Associations have been found between dental fear and less frequent dental visiting, poorer oral health and greater functional impairment. It has been suggested that dental anxiety and fear may be a central aspect of a vicious cycle of dental disadvantage. Parental compliance is also a problem especially if the parent is highly anxious, thus creating a vicious cycle that can be of detriment to the child's dental health.

Whereby numerous causes of the anxiety can be attributed to: previous traumatic experience, fear of instruments, fear of cross infection, and fear of the unknown. A number of variables have been shown to affect the attitude of children in the dental clinic. Different studies have shown that some of the variables affecting acceptance of dental treatment in children include age, gender and socioeconomic status. Others include past dental experience, the experience of the child at the previous dental visits, maternal anxiety and influence of people in the environment.

Increased maternal anxiety results in increased poor child behaviour in the dental clinic and children with poor oral hygiene. Children with increased behaviour problems are the most difficult to treat. Unfortunately this may lead to symptomatic management by the dentist disregarding an ideal treatment plan. These children have also been shown to have a high dmft score, a high frequency of missed or cancelled appointments, and to have late symptomatic presentation.

The productivity of dentists is mainly reflected on how successfully they manage their patients, which ultimately will involve managing the parent as well. The key to effective and efficient dental treatment in paediatric patients is the ability to get them to cooperate and for the parent to be proactive in terms of compliance and promotion of dental visits. It is important for dentists to practise the ability to assess parental dental anxiety in order to identify those paediatric patients of special need with regard to behaviour problems and a higher risk to caries experience. Behaviour management needs to be performed to both child and parent and even in adult patients attending dental clinics. The cycle of anxiety needs to be addressed even from an adult point of view for the problem will stem down to their children. Through spread of basic dental education and behaviour management techniques for all patients, anxiety levels can be reduced which will reduce the negative impact that it has on dental health.

### **Justification**

In Kenya, there is a dearth of information on the subject of dental fear and anxiety. Few studies have been conducted locally to determine the effects of parental anxiety on the child's behaviour during dental treatment. Studies done elsewhere have shown that they are related and contribute towards a negative behaviour during treatment, avoidance of appointments, poor oral health and prolonged treatment duration. The present study attempts to build on this knowledge base especially with regard to our local set up in Kenya. In addition, these previous studies have been inconclusive in showing the relationship between parental anxiety, and the caries experience of the children. It is vital to

investigate this field of dental anxiety since it affects a majority of our paediatric patients.

This study will provide baseline data regarding the effects of parental anxiety on dental treatment and dental caries. Results attained would be useful to dental practitioners in implementing strategies. These strategies can be targeted towards managing parents and the children. Dentists can learn to modify their communication skills with both the parent and the child. Identifying children at risk of high dental anxiety is paramount to establishing positive behaviour that will lead to dental treatment being carried out to the optimum satisfaction for both parent and child.

The purpose of the study is to examine and determine the relationship between parental anxieties and its effects on child behaviour during dental treatment and effects on the carious experience of the paediatric dental patients.

## OBJECTIVES

### **Broad Objective:**

To determine influence of parental anxiety on child behaviour during treatment and child caries experience among 3-5-year-olds.

### **Specific Objectives:**

1. To determine the level of parental anxiety.
2. To determine the behaviour pattern among 3-5-years-olds.
3. To determine the caries experience among 3-5-year-olds.
4. To investigate the relationship between parental anxiety and the behaviour patterns among 3-5-year-old children.
5. To investigate the relationship between parental anxiety and the caries experience among 3-5-year-old children.
6. To investigate the relationship between child behaviour and the caries experience.

## HYPOTHESES

### **NULL HYPOTHESES.**

1. There is no association between parental anxiety and a child's behaviour during dental treatment.
2. There is no association between parental anxiety and a child's caries experience.
3. There is no association between child behaviour pattern and caries experience.

## VARIABLES

<b>Variables</b>	<b>Measurement</b>
<b>Socio-Demographic Variables</b>	
Age of child	Number of years
Age of parent/guardian	Number of years
Gender of the child	Whether male or female
Gender of parent/guardian	Whether male or female
Occupation	Type of work done
Education level of parent	Level of education attained
<b>Independent Variables</b>	
Parental Anxiety	Modified Anxiety Scale Score
Child Behaviour	Frankl Score
<b>Dependent Variables</b>	
Caries Experience	d,m,f,t



## CHAPTER 2

### MATERIALS AND METHODS

#### **Study Design**

The study was a descriptive cross sectional study.

#### **Study Area**

Using purposive sampling, 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.

#### **1. School of Dental Sciences.**

The School of Dental Sciences is situated off Argwings Kodhek road. The School of Dental Sciences was initially established as a Department (the Department of Dental Surgery) within the Faculty of Medicine in 1974. The Department was later upgraded into a Faculty in 1995 and in that phase of development, four departments were established. It offers undergraduate training leading to the Bachelor of Dental Surgery degree and postgraduate training leading to the Master of Dental Surgery (MDS) degrees in: Oral and Maxillofacial Surgery, Periodontology, Prosthetic Dentistry and Paediatric Dentistry. Patients are attended to by both undergraduate and postgraduate students under supervision. Together with three other clinical departments namely, Oral and Maxillofacial Surgery, Periodontology, Community and Preventive Dentistry, Prosthetics and Conservative Dentistry, they act as a referral centre for patients from all parts of Kenya.

#### **2. Kenyatta National Hospital.**

Kenyatta National Hospital (KNH) is the largest referral hospital in Kenya and is situated along the Ngong road in Nairobi. The Dental Department is situated in

the old wing of the hospital. It has sections namely, Diagnosis, Oral Maxillofacial Surgery, Periodontology, Orthodontics, Paediatric Dentistry, Prosthetics and Conservative Dentistry. It is a training centre for internship; and also a referral centre for patients with complex orofacial and dental conditions and ailments.

### **3. Lady Northey City Council Dental Clinic.**

Lady Northey City Council Dental Clinic is situated along State House Avenue. It is run by the Nairobi City Council. It is an out-patient clinic, and caters for children aged below 15 years in the peri-urban and urban Nairobi. The clinic was initially set up so that it can offer preventive and curative dental services to students attending city council primary schools. The clinic is now offering dental services to all children in Nairobi.

#### **Study Population**

The study population involved children aged 3-5 years and the accompanying parents/guardians.

#### **Sample Design and Procedure**

Bankole et al. 2002 reported a prevalence of bad behaviour to be 60% in children whose mothers had had previous unpleasant experiences. Using the prevalence of 60%, a confidence interval of 95%, 5% degree of accuracy and using the formulae below the calculated sample size for a sample of >10,000 was 319.

$n$  = sample size (population > 10,000)

$Z$  = Standard error of mean

$P$  = Prevalence

$d$  = degree of accuracy

Confidence level was 95% hence  $d=0.05$  or 5% and corresponding Z value was 1.96. Prevalence of 60%.

Using the formula:

$$\eta = \frac{Z^2 P(1-P)}{d^2}; \quad \eta = \frac{1.96^2 \times 0.6 \times 0.4}{0.05^2} \quad \eta = 369$$

$n_f$  = the desired sample size ( $\eta < 10,000$ )

$\eta$  = the desired sample size ( $\eta > 10,000$ )

N = the estimated population size ( $< 10,000$ )

$\eta = 369$

N = 2364 (population of patients seen at the 3 hospitals)

$$n_f = \frac{\eta}{(1 + \eta/N)} \quad n_f = \frac{369}{1 + 369/2364} \quad n_f = 319$$

The minimum sample size calculated was 319, however, 330 children and their accompanying parents/guardians were involved.

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.

### **Inclusion Criteria**

1. Children between 3-5 years of age who assented.
2. Parents/Guardians accompanying the children who gave consent.

## **Exclusion Criteria**

1. Those children whose parents did not give consent.
2. Children who did not fall under the age bracket of 3-5 years.
3. Children who did not assent.

## **Data Collection and Instruments.**

A self administered semi structured questionnaire (APPENDIX 1) was used to collect data on socio-demographic information, previous clinical experience and to assess parental anxiety. Where required the investigator explained, clarified or translated aspects of the questionnaire to the parents who did not understand certain aspects of the questions. Parental anxiety was measured using the Modified Dental Anxiety Scale. Modified dental anxiety scale divides patients 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 Frankl Scale during different types of treatment. A specially designed check-list was used to record data obtained the behaviour. It rated children's reaction to dental treatment on a scale. The scale consisted of four categories of behaviour, ranging from 'definitely negative' to 'definitely positive.'

After the behaviour was observed then the investigator examined the children to assess their caries experience. A Clinical examination form was used to record the child's caries experience using the dmft index. Clinical examination was

carried out using 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.

### **Validity**

The principal investigator was calibrated by the supervisor to calculate inter-examiner reliability. In this validation a Cohen's Kappa score of 0.95 was obtained for Child Behaviour Score and 0.89 for Dental Caries which showed good consistency or minimal variability.

### **Reliability**

Pre-testing of the study instruments and tools was done and corrections done. Repeat examination procedures were done on every tenth subject to calculate intra-examiner reliability. A Cohen's Kappa score of 0.91 was obtained for Dental Caries which showed good consistency and minimal variability.

### **Data Analysis and Presentation.**

The clinical forms were pre-coded. Data collected was entered into a computer and analyzed using statistical package for social sciences [SPSS] 12.0[SPSS Inc, Chicago, Illinois, USA]. Data cleaning was done by checking frequencies and re-entering missing data. The information obtained from the study was organised and presented as descriptive statistics in the form of frequency tables and pie charts. Computations were done to calculate mean dmft, parental anxiety and child behaviour. Relationships found were tested using appropriate inferential statistics. A P value of  $< 0.05$  was considered significant.

The following statistical tests were done:

1. Mann Whitney Rank.
2. Kruskal Wallis one way ANOVA.
3. Pearson Chi-square Tests.

### **Control of Biases and errors**

Only the respondents who met the inclusion criteria were enrolled into the study. All data collection tools were pre-tested. All instruments used were calibrated.

### **Ethical Consideration**

The proposal was submitted to the Kenyatta National Hospital and University of Nairobi ethics, research and standards committee for approval. Permission to carry out the investigation was also sought from K.N.H, University of Nairobi Dental School, Ministry of Science and Technology and the Nairobi City Council. The purposes of the study and expected benefits were clearly explained to the parents/guardians and informed consent obtained from them. Information obtained was kept confidential. Participation was voluntary, and participants were at liberty to terminate participation without victimization. Each subject meeting the inclusion criteria had an equal chance of being included in the study. The entire examination was carried out maintaining strict hygienic standards, and those requiring treatment were referred accordingly. Results obtained will be for the benefit of the community.

### **Limitations to the study**

1. Detection of caries was by visual examination and probing only and radiographs were not taken therefore there could have been an under reporting of actual caries experience.
2. In certain cases natural light was used as opposed to light from the dental chair and this might have influenced the results obtained in caries recorded.
3. Children who did not assent due to their behavior could have actually given a better reflection of the situation than those who gave assent.

## CHAPTER 3

### RESULTS

#### 3.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

##### 3.1.1. Children.

This study involved three hundred and thirty children who were clinically examined for dental caries and observed on their behaviour in the clinic. Of these, 174 (52.7%) were males and 156 (47.3%) were females. Their ages ranged between 3-5 years with a mean age of 4.38 years ( $\pm 0.71$  SD). The mean age for the males was 4.37 years ( $\pm 0.72$  SD) while the females had a mean age of 4.38 years ( $\pm 0.70$  SD) Figure 1. Shows the distribution of children according to age and gender. There was no statistically significant difference between the ages for the males and the female children. (Pearson Chi  $\chi^2 = 0.07$ , df 3,  $p = 0.97$ .)

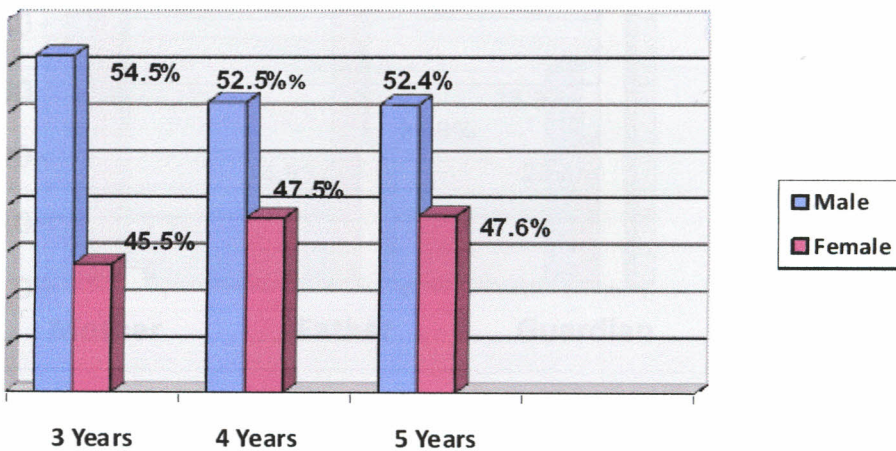


Fig. 1. Distribution of the children by age and gender.



### 3.1.2. Caregivers

A total of 330 parents/guardians were interviewed among whom 121 (36.7%) were below 30 years of age, 177 (53.6%) were between ages 30-40 years and 32 (9.7%) were over 40 years of age. The mean age of the parents was 32.12 years ( $\pm 6.67$  SD). Amongst those interviewed 248 (75.1%) were mothers, 55 (16.7%) were fathers and 27 (8.2%) were guardians. Fig. 2 shows the age of the parents/guardians according to the relationship to the children. Most of the mothers and fathers were between the age group of 30-40 years while the guardians were mainly from the >40 years age group.

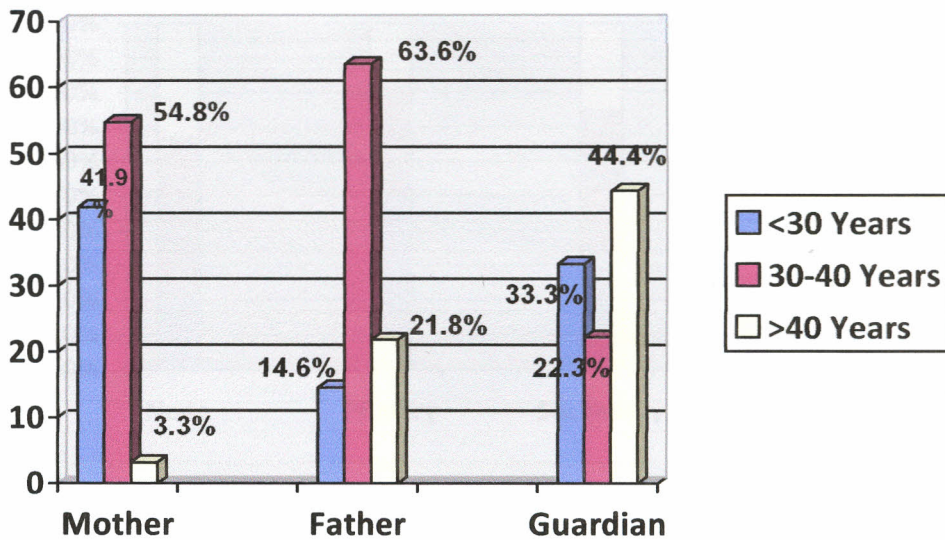


Fig. 2. Pattern of the ages of the parents/guardians according to the relationship with the children.

With respect to the level of education, half of the parents/guardians 165 (50.0%) had attained secondary education, 106 (32.1%) primary education Level, 49 (14.9%) tertiary education while 10 (3.0%) had no formal education.

Fig. 3 shows that there was a direct relationship between employment and education. Most of those with primary education were unemployed 50(47.2%). Among those with no education and secondary education majority had non-formal employment 6 (60%) and 88(53.3%) respectively. In contrast, those with tertiary education majority had formal employment 30(51.0%). (Figure 3)

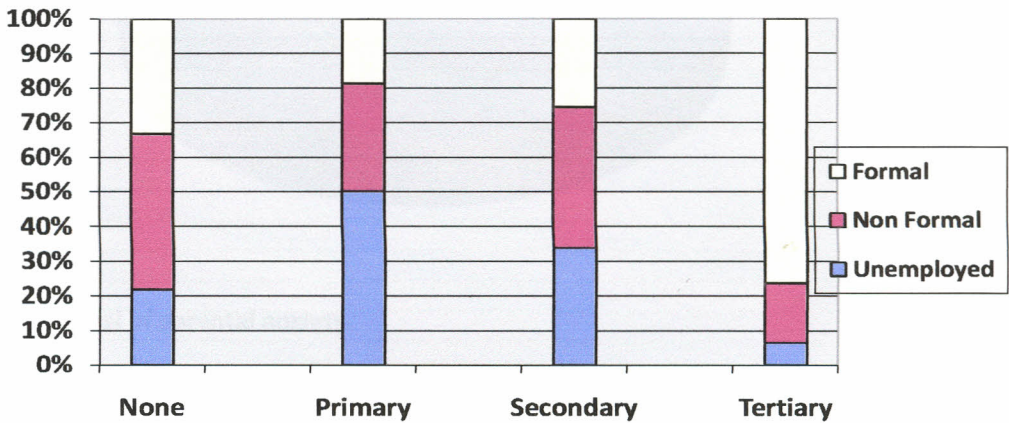


Fig. 3. Distribution of the parents/guardians according to the level of education.

## 3.2 PARENT/GUARDIAN ANXIETY

### 3.2.1. Level of anxiety.

Out of the 330 parents/guardians interviewed, 317 (96.1%) had low anxiety while 13 (3.9%) had high anxiety (Fig. 4).

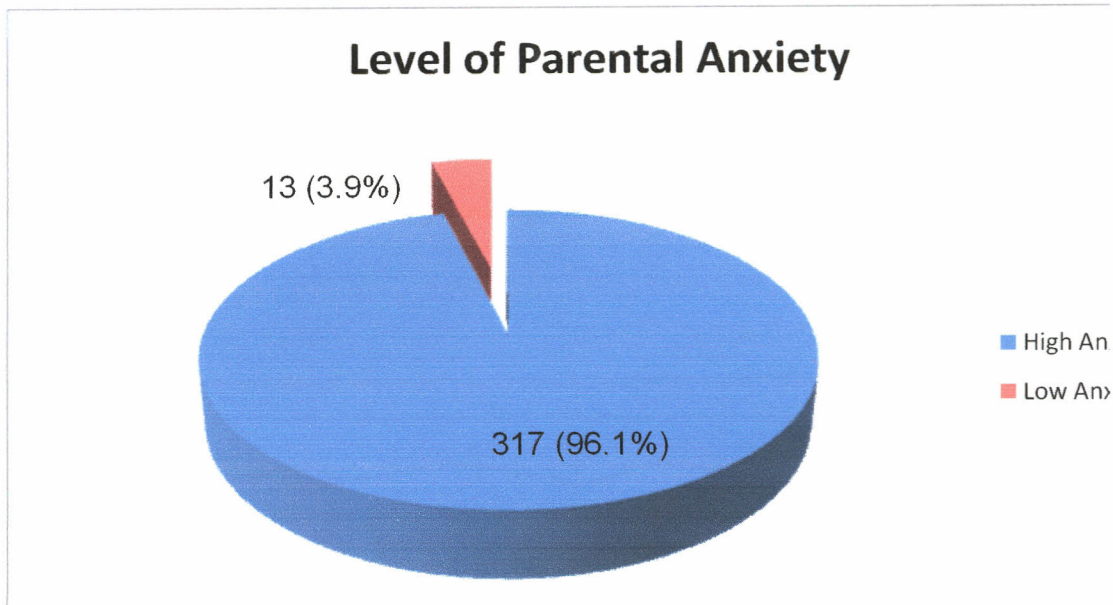


Fig. 4. Level of parental anxiety.

### 3.2.2 Anxiety and Socio-demographic variables.

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. 5 indicates, generally, that mothers had more anxiety than fathers with 12 (4.8%) of mothers having had high anxiety as opposed to 1(1.8%) of fathers. None of the guardians had high anxiety. Anxiety varied with 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. (Fig. 5.)

With reference to occupational status those with formal occupation had more anxiety than those with non-formal or those unemployed. Parents who were unemployed only 1(0.9%), those with non-formal employment 7(4.6%) and those with formal employment 5(7.2%) had high anxiety. (Fig. 5.)

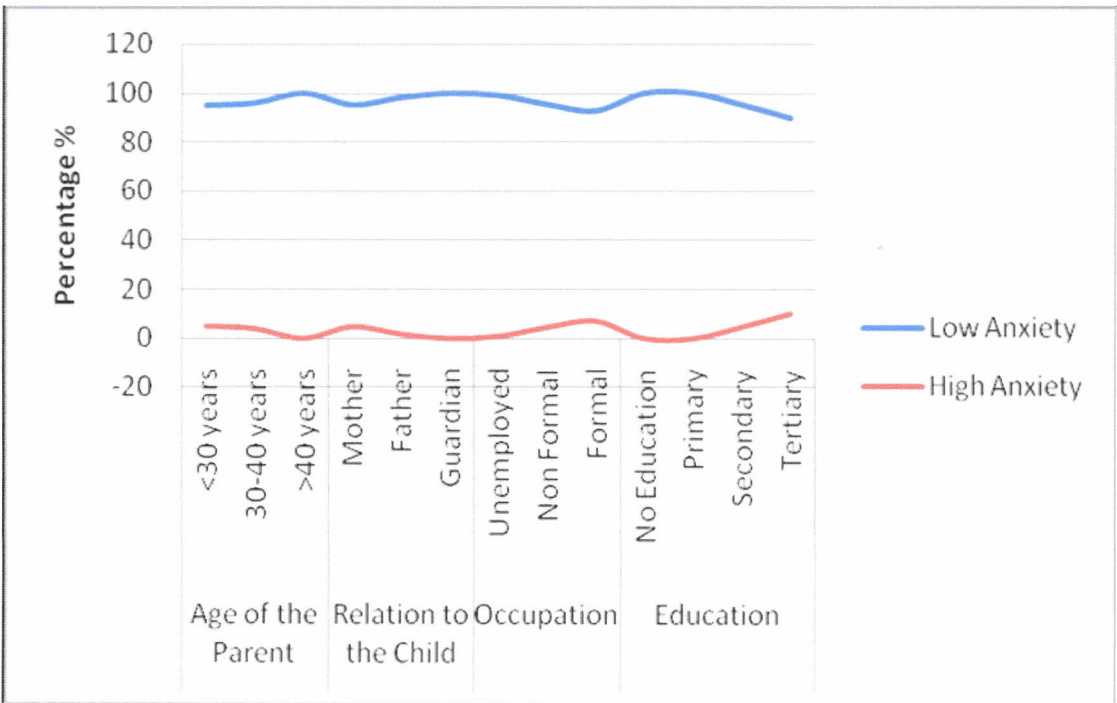


Fig. 5. Parental anxiety by social demographic variables of the parent.

### 3.2.3. Anxiety and Previous clinical experience of the parent/guardian.

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. This was not statistically significant ( $\chi^2 = 2.87$ , d.f 1 and  $p=0.09$ ) as is depicted on Table 1.

In relation to 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.)

**Table 1. Pattern of parental/guardian anxiety according to previous clinical experience.**

Variable		Low Anxiety (%)	High Anxiety (%)	Pearson Chi ( $\chi^2$ ) 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%	

Of the parents who rated themselves as having low anxiety 141(100%) had low anxiety on 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 investigation. This was statistically significant since  $\chi^2 = 17.33$ , d.f 2 and  $p=0.00$ . (Table 2)

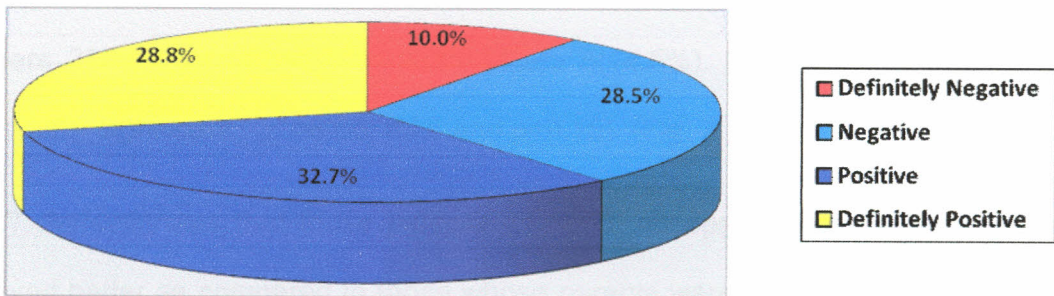
**Table 2. Parental anxiety by self rating of own anxiety.**

Variable		Low Anxiety (%)	Extreme Anxiety (%)	Pearson Chi ( $\chi^2$ ) 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%	

### 3.3. CHILD BEHAVIOUR

#### 3.3.1 Behaviour pattern among 3-5-years-olds.

Among most of the children observed, 108 (32.7%) had 'positive' behaviour, followed by 95 (28.8%) who had 'definitely positive' behavior, 94 (28.5%) had 'negative' behaviour and only 33 (10%) had 'definitely negative' behaviour as is depicted in Fig. 6.



**Fig. 6. Pattern of child behaviour.**

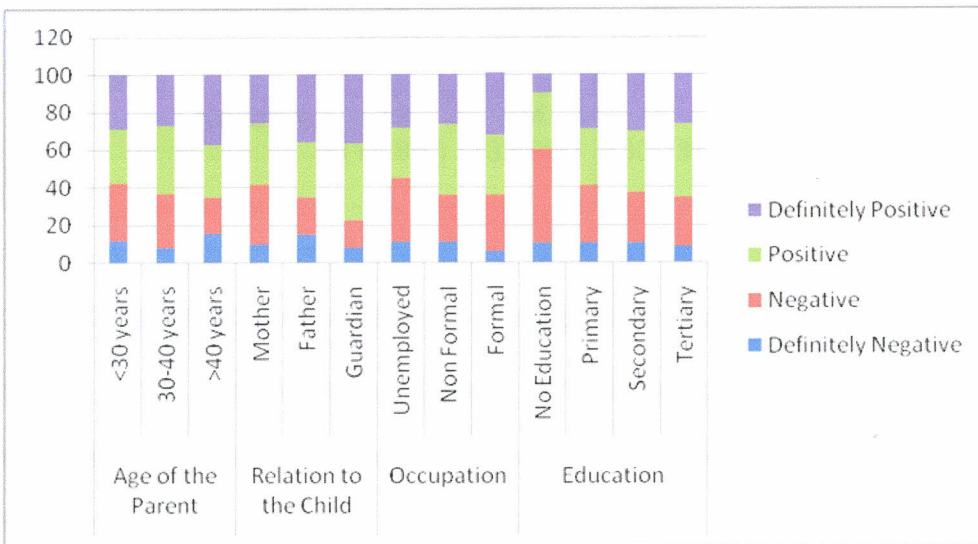
### 3.3.2. Child behaviour and socio demographic variables of the parent/guardian.

Fig. 7 shows that child behaviour varied with parental age. Among the parental age groups those with 'definitely negative' behaviour the highest proportion 5 (15.6%) was among parents in the >40-year-age group whilst the lowest proportion 14(7.9%) was in the 30-40-year-age group. The most well behaved children with 'definitely positive behaviour' 12(37.5%) were in the >40-year-age group while the least proportion 48(27.1%) was in the 30-40-year-age group. However, this distribution was not statistically significant ( $\chi^2 = 5.74$ , d.f 6 and  $p=0.45$ ).

Children accompanied by their guardians were the most well behaved, 10(37.0%) with 'definitely positive' behaviour as compared to 20(36.4%) accompanied by their fathers and 65(26.2%) accompanied by their mothers. Similarly the lowest proportion with the 'definitely negative' behaviour was also from the children accompanied by their guardians 2(7.4%), followed by those presented by their mothers 23(9.3%) and those by their fathers 8(14.5%). However, this was not statistically significant ( $\chi^2 = 8.66$ , d.f 6 and  $p=0.19$ ). (Fig. 7.)

Fig. 7 demonstrates that those parents in formal occupation had children who behaved better as compared to those whose parents were unemployed who had children least well behaved. Those with formal occupation had the lowest proportion with 'definitely negative' behaviour 4(5.8%) and also had the highest proportion with 'definitely positive' behaviour 23(33.3%). However, this distribution was not statistically significant ( $\chi^2 = 5.97$ , d.f 6 and  $p=0.43$ ).

The distribution of child behaviour varied with educational status of the accompanying parent/guardian with an improvement in behaviour from parents who had no education to those with tertiary education. The lowest proportion of children with 'definitely negative' behaviour 4(8.2%) were from parents with tertiary education. However, the highest proportion of children with 'definitely positive' behaviour 50(30.3%) were from parents with secondary education. (Fig. 6.)



**Fig. 7. Pattern of child behaviour according to socio-demographic variables of the parent/guardian.**

### 3.3.3. Child Behaviour and previous clinical experience of the parent/guardian.

Children whose parents/guardians had a previous positive experience had better behaved children as compared to those with a previously negative experience. Of the parents/guardians with a positive experience 17(10.4%) had 'definitely negative' behaviour and 46(28.1%) had 'definitely positive' behaviour. Whilst



those parents/guardians who had had a negative experience had 13(17.8%) with 'definitely negative' behaviour and 14(19.2%) with 'definitely positive' behaviour. (Table 3.) However, this was not statistically significant ( $\chi^2=4.54$ , d.f 3 and  $p=0.21$ ).

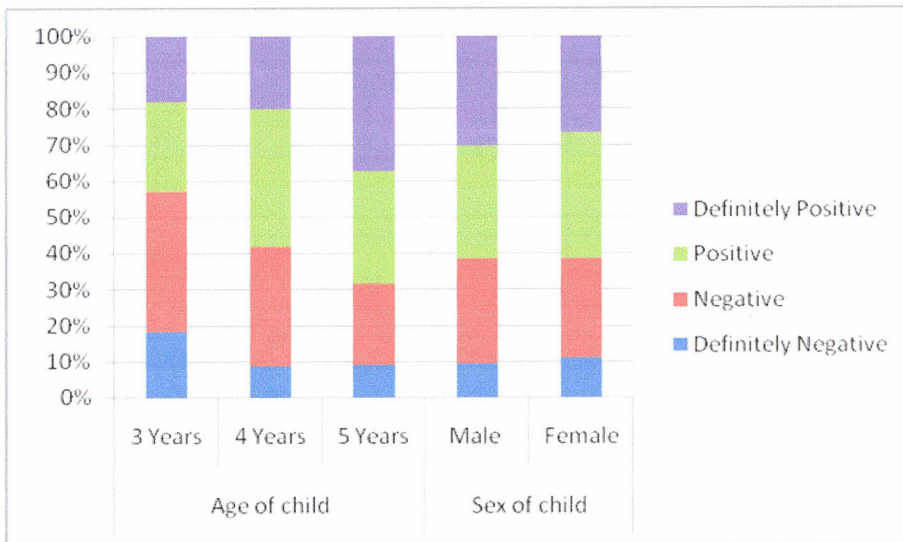
**Table 3. Child behaviour related to previous clinical experience of the parent.**

Variable		Frankl 1 n (%)	Frankl 2 n (%)	Frankl 3 n (%)	Frankl 4 n (%)	Pearson Chi ( $\chi^2$ ) Test
Past Experience	Positive	17 (10.4%)	45 (27.4%)	56 (34.1%)	46 (28.1%)	$\chi^2=4.54$ $p=0.21$
	Negative	13 (17.8%)	24 (32.9%)	22 (30.1%)	14 (19.2%)	

### 3.3.4. Child Behaviour and socio-demographic variables of the child.

Fig. 8. shows the relationship between child behaviour and the demographics of the children. Child behaviour improved with age with the older children having had better behaviour than the younger ones. The 3-year-olds had the highest proportion with 'definitely negative' behaviour 8(18.2%) and the lowest proportion with 'definitely positive' behaviour 8(18.2%) when compared to the 4-year-olds and the 5-year-olds. This distribution was statistically significant( $\chi^2 =18.99$ , d.f 6 and  $p=0.04$ ).

With reference to gender males had better behaviour than females. Males had a higher proportion of 'definitely positive' children 53(30.5%) as opposed to females 42 (26.9%). Similarly females had a higher percentage of 'definitely negative' children 17(10.9%) as opposed to the males 16(9.2%) ( $\chi^2 = 1.01$  d.f 3 and  $p=0.80$ ). This distribution was not significant.



**Fig. 8. Child behaviour in relation to age and gender of the child.**

### 3.3.5. Child behaviour and previous dental visit experience of the child.

Children who had had a previous positive experience behaved poorer than those who had had a previous negative experience as is depicted in Table 4. Most of the children with a previous positive experience had negative behaviour 32(32.3%). In comparison, of those with a previous negative experience, most had positive behaviour 22(57.9%). This distribution was statistically significant ( $\chi^2 = 13.42$ , d.f 3 and  $p=0.004$ ).

Children whose parents expected them to behave positively had better behaviour when compared to those whose parents expected a negative behaviour. Among the children expected to have a positive behaviour, majority of them 77(40.3%) had 'definitely positive' behaviour. Whereas, among those expected to have negative behaviour, most 60(43.2%) had 'negative' behaviour. This was statistically significant ( $\chi^2 = 57.83$ , d.f 3 and  $p=0.00$ ).

**Table 4. Child behaviour related to previous dental visit experience of the child.**

Variable		Frankl 1 (%)	Frankl 2 (%)	Frankl 3 (%)	Frankl 4 (%)	Pearson Chi ( $\chi^2$ ) Test
Past Behaviour	Negative (n=99)	6.1%	30.3%	32.3%	31.3%	$\chi^2=13.4$ p=0.004
	Positive (n=38)	13.2%	57.8%	13.2%	15.8%	
Expected Behaviour	Negative (n=139)	16.0%	43.2%	28.9%	11.9%	$\chi^2=57.83$ p=0.00
	Positive (n=191)	4.2%	17.8%	37.7%	40.3%	

### 3.3.6. Child Behaviour and previous dental visit experience of the parent.

Parents with a previous positive experience had most of their children 56(34.1%) with a positive behaviour. (Table 5.) This was different to those who had had a negative experience where most children 24(32.9%) had a negative behaviour. This is not significant ( $\chi^2=4.54$ , d.f 3 and p=0.21).

**Table 5. Child behaviour related to clinical experience of the parent/guardian.**

Variable		Frankl 1 (%)	Frankl 2 (%)	Frankl 3 (%)	Frankl 4 (%)	Pearson Chi ( $\chi^2$ ) Test
Past Dental Experience	Positive (n=164)	10.4%	27.4%	34.1%	28.1%	$\chi^2=4.54$ p=0.21
	Negative (n=73)	17.8%	32.9%	30.1%	19.2%	

### 3.4 ASSOCIATION OF PARENTAL ANXIETY WITH THE BEHAVIOUR PATTERNS AMONG 3- 5-YEAR OLDS.

The distribution of child behaviour varied with parental anxiety. Parents/guardians with low anxiety had more children who were well behaved and parents with high anxiety had more children who were poorly behaved. However, this was not statistically significant ( $X^2=3.04$ , d.f 1 and  $p=0.08$ ). Therefore, the null hypothesis  $H_0$  that there is no association between parental anxiety and Child behaviour during dental treatment is accepted.

**Table 6. Distribution of Child behaviour and parental anxiety.**

Variable		Positive Behaviour n(%)	Negative Behaviour n(%)	Statistical Test Pearson Chi $X^2$
Parental anxiety	Low	119 (93.7%)	8 (6.3%)	$X^2=3.04$ $p=0.08$
	High	198 (38.5%)	5 (62.5%)	

### 3.5. DENTAL CARIES

#### 3.5.1. Caries experience in the children

Of the 330 children examined only 21 (6.4%) were caries free, hence overall prevalence was 93.6%. Prevalence of caries among the 3-year-olds was 95.5%, while among 4-year-olds it was 97.5% and the 5-year-olds it was 90.5%. Boys had a lower prevalence of 93.1% as compared to girls whose prevalence was 94.2%.

The mean dmft of the children examined was 8.14 ( $\pm 5.34$  SD). There was a decrease of mean dmft with an increase in age among 3, 4 and 5-year-olds which was 9.16 ( $\pm 5.59$  SD), 8.84 ( $\pm 5.59$  SD) and 7.38 ( $\pm 5.02$  SD) respectively as is shown in Table 7. 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 5 year-olds had the the highest missing mean component of 0.80 as opposed to the 3-year-olds that had the least of 0.55. Whereas in terms of the mean filled component the 3 and 4-year-olds had the highest mean of 0.09 and the 5 year-olds the least mean of 0.03. This was statistically significant ( $\chi^2=5.94$ , d.f 2 and  $p=0.01$ ).

**Table 7: Mean dmft of according to children’s age.**

Variable	(N)	decayed mean	missing mean	filled Mean	dmft mean	Kruskal Wallis Test
Age						
3 yrs	44	8.55	0.55	0.09	9.16	$\chi^2=5.94$ $p=0.01$
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	

As in indicated in Table 8 boys had a higher dmft mean of 8.32 ( $\pm 5.56$  SD) than girls whose dmft mean was 7.94 ( $\pm 5.12$  SD). 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 in the boys and in the girls at 0.80. However, the girls had a higher mean filled component of 0.77 in comparison to that of boys which was 0.46. This was not significant ( $U=13170$  and  $p=0.64$ ).

**Table 8. The mean dmft related to gender of the children.**

Variable	(N)	Decayed mean	missing mean	filled mean	dmft mean	Mann Whitney U Test
Gender						
Male	174	7.48	0.80	0.46	8.32	U=13170 p=0.64
Female	156	7.04	0.80	0.77	7.94	
Total	330	7.27	0.80	0.61	8.14	

### **3.5.2. Caries Experience of children and socio-demographic variables of the parent.**

Children of parents in the age group 30-40years had the highest dmft 8.18 ( $\pm$  5.49 SD), followed by those of parents/guardians <30 years 8.14 ( $\pm$  4.99 SD) and lastly parents >40 years had the least dmft 7.91 ( $\pm$  6.04 SD). This however, was not statistically significant ( $\chi^2=0.37$ , d.f 2 and  $p=0.83$ ).

Those children accompanied by their mothers had the highest dmft 8.24 ( $\pm$ 5.37 SD), followed by those accompanied by fathers 8.13 ( $\pm$  5.83 SD) and those accompanied by guardians 7.26 ( $\pm$  4.12 SD) as shown in Table 9. This was not statistically significant ( $\chi^2=0.23$  d.f 2 and  $p=0.89$ ).

The dmft of children varied with the level of education of their parents. Children of parents/guardians with tertiary education had the least dmft 7.16 ( $\pm$ 4.88 SD), followed by those with no education 7.70 ( $\pm$ 4.22 SD), primary education 8.25 ( $\pm$ 4.22 SD), and those with secondary education had the highest dmft of 8.38 ( $\pm$ 5.86 SD) as shown in Table 9. This was not statistically significant ( $\chi^2=1.70$  d.f 3 and  $p=0.64$ ).

Parents/guardians with non-formal occupations had children with the highest dmft 8.42 ( $\pm$  5.51 SD), followed by those with formal employment 8.14 ( $\pm$  5.46 SD) and those unemployed with a dmft of 7.80 ( $\pm$ 5.06 SD). This was not statistically significant ( $X^2=0.68$  d.f 2 and  $p=0.71$ ).

**Table 9. Caries experience of the children related to socio-demographic variables of the parents/guardians.**

Variable	(N)	mean dmft	Kruskal Wallis Test
Age group <30 years 30-40 years >41 years	121 177 32	8.14 8.18 7.91	$\chi^2=0.37$ p=0.83
Relationship of Caregiver Mother Father Guardian	248 55 27	8.24 8.13 7.26	$\chi^2=0.23$ p=0.89
Occupation Unemployed Non Formal Formal	108 153 69	7.80 8.42 8.14	$\chi^2=0.68$ p=0.71
Educatn level None Primary Secondary Tertiary	10 106 165 49	7.70 8.25 8.38 7.16	$\chi^2=1.70$ p=0.64

### **3.5.3. Caries experience and previous parental dental visit experience.**

Parents with a previous negative experience had children with higher dmft mean 8.68 ( $\pm 5.42$  SD) as compared to those with a previous positive experience whose children had a dmft mean of 7.83 ( $\pm 5.10$  SD). (Table 10.) Notably patrents who had a previous negative experience had children with a higher mean decayed component of 7.86, a higher mean missing component of 0.74 and also a higher



mean filled component of 0.08. However, this was not significant (U=5468 and p=0.29).

**Table 10. Caries experience of child related previous past parental dental visit experience.**

	(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	

### **3.6. ASSOCIATION OF PARENTAL ANXIETY AND CHILD'S CARIES EXPERIENCE.**

There was an increase in child dmft as the parent/guardian anxiety became more severe. Parents/guardians with low anxiety had the lowest dmft of 8.10 ( $\pm 5.36$  SD) and those with high anxiety had highest dmft of 9.08 ( $\pm 5.30$  SD) as is shown in Table 11. The mean decayed component was lower at 7.25 in children's whose parents had low anxiety as opposed to those with high anxiety with a mean of 7.77. The mean missing component was lower at 0.77 in children whose parents had high anxiety and 0.80 in parents with low anxiety. The mean filled component was also lower at 0.04 in children whose parents had low anxiety as compared to 0.54 in parents with high anxiety. There was no statistical significant difference (U =1788, d.f 2 and p=0.42). Therefore, the null hypothesis H<sub>1</sub> that there is no association between parental anxiety and a child's caries experience is accepted.

**Table 11. Caries Experience and parental anxiety.**

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	

### 3.7. RELATIONSHIP BETWEEN CHILD BEHAVIOUR AND CARIES EXPERIENCE.

Children who exhibited poor behaviour had a higher mean dmft than those that had good behaviour. The children with definitely negative behaviour had the highest mean dmft 9.73 ( $\pm$  6.00 SD) while those with definitely positive behaviour had the lowest mean dmft 7.43 ( $\pm$  4.92 SD). (Table 12.) Children with 'definitely negative' behaviour had the highest means in the decayed, missing and filled component at 8.76, 0.79 and 0.18 respectively. This was not statistically significant ( $\chi^2=4.52$  d.f 3 and  $p=0.21$ ). Therefore the null hypothesis  $H_2$  that there is no association between child behaviour pattern and caries experience is accepted.

**Table 12. Distribution of caries experience in relation to the children's behaviour.**

Variable	(N)	decayed mean	missing mean	Filled mean	dmft mean	Kruskal Wallis Test
Child Behaviour						
Def. Neg	33	8.76	0.79	0.18	9.73	$\chi^2=4.52$ $p=0.21$
Negative	94	7.47	1.14	0.01	8.62	
Positive	108	7.35	0.54	0.00	7.86	
Def. Positive	95	6.47	0.76	0.14	7.43	
Total	330	7.27	0.80	0.06	8.14	

## CHAPTER 4

### DISCUSSION

#### 4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION.

The mean age of the children in this study was 4.38 years, with the distribution skewed towards the 5 year olds who were 50.9% of the children population. A similar distribution has been reported by Ngatia et al. 2001<sup>38</sup> in Nairobi and Njoroge et al. 2007<sup>39</sup> in Kiambu. A higher proportion of older children presented in the clinics and this could be as a result of teeth being present for a longer duration in the oral cavity hence more prone to be suffering from dental disease.

The boys to girls ratio for the children was 1:1 which is similar to previous Kenyan studies done by Ngatia et al. 2001<sup>38</sup> and Njoroge et al. 2007.<sup>39</sup> This could be a reflection of the Kenyan population where the ratio of male to female is approximately 1:1 as is reflected in the 2006 Kenya Bureau of Statistics report.<sup>40</sup>

Majority of the mothers (54.8%) and fathers (63.6%) had their ages fall between the age group of 30-40-year age group which was similar to a study by Ngatia et al.<sup>38</sup> However, a study done by Mumghamba et al. 2006<sup>41</sup> in Dar-es-salaam differs from the current study where majority of mothers were from 20-29-year age group. This could be explained by the fact that parents in this study got children at an older age due to different social and cultural background between Kenya and Tanzania. Tanzanian is predominantly Muslim as opposed to the Kenyan set-up which is predominantly Christian, and there is a tendency of Muslims getting married at an early age.

The education level of the parents in the study group was relatively high with about 51.2% of mothers and 49.1 of fathers having attained secondary education. The parents had a higher education than that reported by the Kenya Demographic and Health Survey.<sup>42</sup> This could be attributed to the urban set-up where a larger population would be expected to be more educated as compared to population in the survey with both urban and rural people.

In the current study, 32.7% of the parents were not in any form of employment whilst in another study by Njoroge et al. 2007<sup>39</sup> 34% of parents had no form of employment. This is a reflection of the current economic situation where the employment levels are low. Amongst those employed majority were fathers which is representative of our cultural setup where they play the role of bread winners.

## **4.2. PARENTAL ANXIETY**

### **4.2.1. Level of Parental Anxiety**

The total prevalence of high anxiety for the parents in this study population was 3.9%. Locker et al. 1999<sup>43</sup> reported a prevalence of 4.4% while Eli et al. 1992<sup>17</sup>, reported 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 actually presented themselves and their children to the clinic without succumbing to their anxiety.

In the current study the mean anxiety score of 9.58 for mothers while the fathers had a mean anxiety mean score of 7.85. Folayan et al. 2002<sup>44</sup> in Nigeria reported

a mean anxiety score of 9.40 for mothers and a mean score of 8.38 for fathers. This 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 found 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 interviewed only 1(1.8%) had high anxiety and none of the guardians had any high anxiety. In Nigeria, Folayan et al. 2002<sup>44</sup> reported 7.5% of mothers and 1.2% of fathers having high anxiety. Doerr et al. 1999<sup>45</sup> in U.S.A 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 study can be explained by the fact that Folayan et al. 2002<sup>44</sup> had a smaller sample size of 53 mothers and 35 fathers, and thus his sample was not as representative and 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 in U.S.A can be attributed to a higher dental experience exposure in the U.S.A as opposed to our current setup.

#### **4.2.2. Parental Anxiety and socio-demographic variables.**

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. 1999<sup>45</sup> in U.S.A 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 become an inner representation that affect behaviour as was argued by Bowden in the Attachment Theory.<sup>5</sup> 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.

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. This was different from a U.S.A study<sup>45</sup> whereby fewer years of education reflected a higher anxiety prevalence. In our setup the less educated have no education can be implied to have a lack of adequate dental education and lack of dental practice exposure. This 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<sup>46</sup> argued that low education creates a social embarrassment to the patient since they are anxious about how to communicate to a highly educated dentist.

With reference to 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 observed 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<sup>45</sup> 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.

#### **4.2.3 Parental anxiety and previous clinical experience.**

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<sup>47</sup> among a female population, whereby they demonstrated that previous experience or expectations had no influence on anxiety. This can be attributed to the fact the dental anxiety is inherent and not dependent on previous experiences.

A significant relationship was established between how parents rated their own anxiety and to how they actual scored on the anxiety scale. A similar finding was reported by Heaton et al. 2007<sup>47</sup> where there was a significant relationship between self-reported and observed measures of dental anxiety, despite an overall low level of anxiety.

### **4.3 CHILD BEHAVIOUR**

#### **4.3.1 Level of Child behaviour among 3-5-year-olds.**

In the study population 61.5% had positive behavior as compared to 127 (38.5%) that had negative behavior. Not many studies have been done on child behavior during dental treatment especially for this age group, however, a study done in Western Washington State<sup>48</sup> reported a prevalence of 21% for negative behavior among 21 children. The differences in results as compared to this study would be

explained by the differences in age group whereby Baier et al. 2004<sup>48</sup> had children with a mean age of 8 years. It is expected that older children are better behaved. In addition the study<sup>48</sup> had a small sample size of 21 children, which may not have been as representative as that of the present study. That study was also done in a private clinic, where the environment was different from that of a public setup and would bias the results.

Child behaviour improved with age with the older children being better behaved which was in agreement with studies by Klorman et al. 1979<sup>49</sup> and Lee et al. 2008<sup>50</sup> Klorman et al. 1979<sup>49</sup> found a similar relationship to this study whereby behaviour was negatively associated with children's age. In Taiwan, Lee et al. 2008<sup>50</sup> found that children <3.99yrs of age had significant higher levels of uncooperativeness as opposed to children 4-4.99 years of age. This was different from a study by Johnson et al.<sup>51</sup> who found that age had no relationship to child behaviour during tooth extraction. However, Johnson's study<sup>51</sup> could have a variation from this study as a result of a smaller sample size of 80 children and a larger age group of 3-7, as compared to the larger sample size of 330 in this study and smaller age group of 3-5yr olds. The present study is in agreement with Klorman et al. 1979<sup>49</sup> and Lee et al. 2008<sup>50</sup> possibly because children at 3 years of age have very little understanding of their surroundings and would be expected to behave poorer in a frightening situation than older children who would be more mature psychologically.

With reference to gender, males had better behaviour than females. This could be as a result of the fact that majority of the children were accompanied by their mothers. With reference to the oedipus complex boys would be better behaved in



the presence of their mothers at this age as opposed to the girls. However, this difference was not significant and this was similar to Johnson et al. 1968<sup>51</sup> who found that sex was not a contributing factor to child behaviour.

#### **4.3.2. Child behaviour and previous clinical experience.**

Previous child behaviour had a significant inverse relationship on exhibited child behaviour. Those that behaved poorly previously behaved positively in the rating and vice versa. This is in contrast to studies done by Lee et al. 2008<sup>50</sup> and Johnson et al. 1968<sup>51</sup> who also found that children expressing cooperation had significantly lower uncooperative behaviour than children who were uncooperative in the first dental visit. This could imply that children with a history of poor behaviour are managed better than those with a previous positive behaviour. As a result children who had positive behaviour are not managed as well as those of negative behaviour and hence their behaviour can change negatively.

#### **4.3.3. Child behaviour and parental prediction.**

A significant relationship between behaviour that the parents predicted and behaviour rating of the child was established. In Nigeria, Bankole et al. 2002<sup>30</sup> showed that mothers were able to predict the behaviour of their children. This was also similar to the study by Johnson et al. 1968<sup>51</sup> implying that parents can accurately predict the behaviour of their children in the dental practice in our set up.

#### **4.3.4 Child Behaviour and the Socio-Demographics of the parent/guardian.**

There was no association between parental age and child behaviour in the current study and there are no previous studies which been found to compare the association of parental age and child behaviour in the dental clinic. This can be explained by the fact that the psycho-social development of the child is dependent on the parent, especially the mother, however the age of the mother is not a factor.

With regards to the parent/guardian present at the clinic, it appeared that the children were better behaved with their father or a guardian present as opposed to their mothers. This was not statistically significant. Unfortunately studies on child behaviour could not be found with this variable in consideration.

There was a positive relationship between child behaviour and the education and occupation of the parent/guardian. However, this was not statistically significant. It can be postulated that a higher educational status of the parent would represent an improvement in psycho-social upbringing of the child, therefore, obtaining better behaved children.

With reference to parental/guardian experience, those with a positive experience before had more children with positive behaviour as opposed to those with a negative experience that had more children with a negative behaviour. Bankole et al. 2002<sup>30</sup> reported a significant influence of mother's previous experience and child behaviour. The current study did not find a significant difference but a reason can be that the study included both guardians and father's accompanying the children.

## 4.4 DENTAL CARIES

### 4.4.1. Dental Caries experience among 3-5-year-olds.

Overall prevalence of dental caries in the study population was 93.6%. In two Kenyan studies the prevalence has been reported as 63.5% and 45% by Ngatia et al. 2001<sup>38</sup> and Masiga et al.1993<sup>52</sup> respectively. In Uganda, Kiwanuka<sup>53,54</sup> has reported a prevalence of 64% and Wyne et al. 2002<sup>55</sup> a prevalence of 94.4 in Saudi Arabia. The higher prevalence in the current study may reflect differences in the study settings in the Kenyan<sup>38,52</sup> and Ugandan. <sup>53,54</sup> The current study was clinical based where by most patients had presented as a result of symptoms associated with dental caries hence the prevalence would be higher than the Kenyan and Ugandan studies which were surveys.

Prevalence of dental caries among among girls at 94.2% was higher than in boys at 93.1% which is similar to findings reported by Ngatia et al. 2001<sup>38</sup>, Masiga et al.1993<sup>52</sup> and Kiwanuka et al.<sup>53,54</sup> This could be explained by the fact that girls are more prone to cariogenic foods than boys as a result of their snacking patterns. Girls are more likely to spend more time in the kitchen and are likely to snack more on cariogenic foods. In addition, in our setup teeth in girls erupt earlier than in males, upto about 10months.<sup>56</sup> This can also be a contributory factor since the teeth are exposed for a longer time in the mouth to risk factors.

The mean dmft in this current study was 8.14. which was much higher than Ngatia et al.2001<sup>38</sup> and Masiga et al.1993<sup>52</sup> who reported lower means of 2.4 and 1.7 among urban 3-5 yr olds respectively. In Saudia Arabia dmft means of 7.1 upto 8.4 in Abu Dhabi by Al-Hosani et al.1998<sup>57</sup> and Paul et al. 2003<sup>58</sup> have been reported which was similar to the current study. The studies by Ngatia et al.

2001<sup>38</sup>, Masiga et al. 1993<sup>52</sup> have lower means because their studies were not based in a clinical setup where patients present symptomatically.

Notably important was the fact that a huge component of dmft was contributed by a large proportion of the decayed component. The mean of the decayed component was  $7.27 \pm 4.98$  SD, missing component  $0.80 \pm 0.17$  and that of filled component was  $0.06 \pm 0.50$  SD. Ngatia et al. 2001<sup>38</sup> had reported similar findings in Nairobi and Kiwanuka et al.<sup>53,54</sup> in Uganda. This translates to a high rate of untreated dental needs observed in this study population where the decayed component supercedes the filled component. A myriad of reasons can account for this, ranging from poor public dental awareness, high cost of dental treatment, lack of accessible and adequate dental facilities in the dental practice, ignorance and negative attitude towards dental treatment.

Boys had a higher dmft than girls with a mean of 8.32 and 7.95 respectively which was similar to what Ngatia et al. 2001<sup>38</sup> observed. The missing component was similar for both boys and girls. However, the girls had a higher mean filled component than the boys. The difference in caries experience between girls and boys may be as a result of socio-cultural factors, whereby girls and/or their parents may be more meticulous in their personal hygiene and thus better oral care. Girls also mature earlier than boys and usually attain a higher level of responsibility.

Caries experience differed among the age groups, with a general decrease in dmft mean as the children got older. The 5-year-olds had the lowest mean in the

filled component and the highest mean missing component than the 3 and 4-year-olds. In the current study this was statistically significant. This was, however, different from previous studies where the trend is to have an increase in dmft as the age increases.<sup>38</sup> This 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.

#### **4.4.2. Child Caries experience against socio-demographic variables of the parents/guardians.**

Caries experience in children was lowest in the oldest parental/guardian age group of >40 years of age, followed by the <30 years and highest was among the 30-40 years old. Matilla et al. 2000<sup>59</sup> reported that the older the parent the least the experience which was similar to this study.

In relation to the parental/guardian education there was an increase in children's caries experience with an increase in educational level. This distribution was also similar to a study reported by Matilla et al. 2000<sup>58</sup> and could be explained that the lowly educated were most likely in a low socio-economic status and might not be able to afford cariogenic foods. Hence these children were least exposed to cariogenic foods. However, there was an opposite effect between parents with secondary education and tertiary education where the children had dmft means of 8.38 and 7.16. In this case as argued by Kiwanuka et al.<sup>53,54</sup> and Hashim et al. 2006<sup>60</sup>, those whose parents were highly educated will have children with the lowest caries experience as was in this study where they had the lowest at 7.16.

A possible explanation is that those highly educated can control the frequency of sugar consumption of their children hence the lower caries experience.

With reference to parental/guardian occupation, those whose parents/guardians were unemployed had children with the least caries experience as opposed to those who were employed. Similar relationship of employment and income has been reported by Matilla et al. 2000<sup>59</sup> This can be explained that unemployed will most likely belong to a lower socio-economic class and hence will not be able to afford cariogenic foods. Also, between those who were employed, parents with non-formal jobs had a higher carious experience as those who had formal jobs. This could be explained by the fact that parents with non-formal jobs were practically less present at home and hence monitoring of child's diet and frequency was less than that of parents with formal employment.

#### **4.5. RELATIONSHIP OF PARENTAL ANXIETY WITH THE BEHAVIOUR PATTERNS AMONG 3- 5-YEAR-OLDS.**

When parental/guardian anxiety was compared to behaviour patterns of the children, it was shown that parents with high anxiety yielded children with negative behaviour. This was not statistically significant in the current study. Conflicting findings in previous studies differ on whether the relationship is significant or not. Klorman et al.<sup>49</sup> found that mothers' anxiety was not an influencing factor in child behaviour, whereas, Johnson et al. 1968<sup>51</sup> and Rodrigues et al. 1996<sup>31</sup> in India found that maternal anxiety was a significant factor in negative child behaviour. Rodrigues et al. 1997<sup>32</sup> in addition observed a

significant relationship between the levels of maternal anxiety and the behaviour of children during the first dental visit among 3-12-year-olds. This study, however, did not look at mothers alone but also included fathers and guardians and this could be a source of difference. Also, this study used the Modified Dental Anxiety as opposed to the Taylor Manifest Anxiety scale as used in Johnson's study or Picture Test used in Klorman's study. In addition, other factors could be predispose to poor behaviour in our set up such as long waiting periods during dental treatment or children getting anxious after other children have received their treatment.

#### **4.6. RELATIONSHIP OF PARENTAL ANXIETY WITH CHILDREN'S DENTAL CARIES EXPERIENCE.**

In the current study parents that had low anxiety had children with the lowest 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. However, this was not statistically significant, and the null hypothesis  $H_1$  that there is no association between parental anxiety and a child's caries experience is accepted. Very few studies have been done linking the two but in 1989, Lahti et al.<sup>12</sup> had found that a higher level of parental dental anxiety was found among caries-active children. This was similar to this study and a reason it was not significant in this study could be attributed to the fact that the sample population had very few parents who were representative of high parental anxiety.

Similarly, parents who had had experiences naegative dental experiences had children with highest dmft scores, mean decayed component, mean missing

component and mean filled component. It is this same parents with previous negative experiences that significantly higher dental anxiety. This situation is similar to that of Lahti et al. 1989<sup>12</sup> since those with previous negative anxiety were those with high parental anxiety.

#### **4.7. RELATIONSHIP BETWEEN CHILD BEHAVIOUR AND DENTAL CARIES EXPERIENCE.**

Children with negative behaviour exhibited a higher caries experience than children with positive behaviour. Those with negative behaviour had higher means of decayed, missing and filled components than children with positive behaviour. This was not statistically significant. Therefore there is no relationship between child behaviour and dental caries experience. No study has been done whereby a relationship between child behaviour and dental caries was obtained to compare and contrast with this current study. Children with negative behaviour are difficult to treat and thus the caries experience will be at a larger extent. Bedi et al.<sup>27</sup> and Milsom et. al<sup>10</sup> showed that anxious children have higher dmft scores as well as higher means in the decayed, missing and filled components. Anxious children will have negative behaviour and therefore the same representation in caries experience.



## **CONCLUSIONS**

The overall prevalence of high dental anxiety was low at 3.9% but parents/guardians could accurately able to predict their own anxiety. Irrespective of the low levels of high anxiety there was still a large number of children with negative behaviour. There was no significant relationship between the parental anxiety and the behaviour exhibited by the child.

Majority of the children had positive behaviour with the prevalence of definitely negative behaviour was 10% and that of negative behaviour was 28.5%. Child behaviour improved significantly with age. Parents were able to correctly predict the behaviour of their children, and the same behaviour was also significantly related to previous clinical experience of the child. Child behaviour had no relationship with the dental caries experience of the children

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 component was 0.80 and there was a low filled component of 0.06 which reflected a lot of unmet treatment needs. Child caries significantly reduced with age of the children. There was no association between parental/guardian anxiety and dental caries experience of the child.

## **RECOMMENDATIONS**

1. Irrespective of low anxiety there were still a large proportion of children with negative child behaviour signifying that other factors contributed to negative child behaviour. Hence the need to conduct further research to elicit factors that contribute to negative child behaviour in children.
2. A future study can be done to survey parental anxiety in the general population as opposed to a hospital-based study so as to obtain a general overview on anxiety. Anxious parents may not present themselves and/or their children to the dental clinic and therefore a larger proportion would be obtained in the population.
3. A study can also be carried out differentiating between the influence of maternal and paternal anxiety and that of guardians accompanying the children. In addition single parents can also be studied to see if they have a similar influence on child behaviour.
4. The proportion of unmet needs was high, thus the need for implementation of strategies targeting promotion, prevention and early treatment of dental caries in children. It is also necessary to conduct further research to elicit factors influencing high unmet treatment needs in children with dental caries.

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**APPENDICES**

**APPENDIX 1: DATA COLLECTION TOOL**

1. Patient Number .....

2. Age of child.....

3. Sex of Child      M       F

4. Position of the child in the family

5. Relationship to Child      Mother       Father       Other

6. Age of Parent/Guardian

7. Parent's occupation

Unemployed

Petty Trader

Unskilled Worker/Labor

Skilled Worker

Farmer

Civil Servant

Professional

Businessman

Not Known

8. Educational Status of the parent

No Formal Education

Primary level

Secondary Level

College/Polytechnic

University

9. Have you ever visited a dentist?

Yes  No

10. If yes what was your dental experience like?

I enjoyed it  I did not like it   
It didn't bother me  you had a bad time

11. How would you rate your own anxiety?

High  Moderately High   
Moderately Low  Low

12. How do you think your child will react to this treatment?

Very Poorly  Well   
Poorly  Excellently

13. How do you rate your child's anxiety at the moment?

High  Moderately High   
Moderately Low  Low

14. Is this your child's first dental visit?

Yes  No

15. How did your child react to past dental procedures?

Very Poorly  Poorly   
Well  Excellently

DATA COLLECTION FORM

**1. Modified Dental Scale:**

Each item scored as follows:

- Not anxious=1
- Slightly anxious=2
- Fairly anxious=3
- Very anxious=4
- Extremely anxious=5

Total score is a sum of all five items, range 5 to 25: Cut off is 19 or above which indicates a highly dentally anxious patient, possibly dentally phobic

1. If you went to your Dentist for TREATMENT TOMORROW, how would you feel?

- Not Anxious*
- Slightly Anxious*
- Fairly Anxious*
- Very Anxious*
- Extremely Anxious*

2. If you were sitting in the WAITING ROOM (waiting for treatment), how would you feel?

- Not Anxious*
- Slightly Anxious*
- Fairly Anxious*
- Very Anxious*
- Extremely Anxious*

3. If you were about to have a TOOTH DRILLED, how would you feel?

- Not Anxious*
- Slightly Anxious*
- Fairly Anxious*
- Very Anxious*
- Extremely Anxious*

4. If you were about to have your TEETH SCALED AND POLISHED, how would you feel?

- Not Anxious*
- Slightly Anxious*
- Fairly Anxious*
- Very Anxious*
- Extremely Anxious*

5. If you were about to have a LOCAL ANAESTHETIC INJECTION in your gum, above an upper back tooth, how would you feel?

- Not Anxious*
- Slightly Anxious*
- Fairly Anxious*
- Very Anxious*
- Extremely Anxious*

**2. Frankl Scale**

Rating 1. Definitely Negative. Refusal of treatment. Crying Forcefully. Fearful or any overt evidence of extreme negativism.

Rating 2. Negative. Reluctant to treatment. Some evidence of negative attitude but not pronounced.

Rating 3. Positive. Acceptance of treatment. At times cautious, willingness to comply with the Dentist at times with reservation but patiently follows cooperatively.

Rating 4. Definitely Positive. Good rapport with the Dentist. Interested in the procedure. Laughing and enjoying the situation.

Entering the Clinic	
Sitting on the Chair	
Examination	
Radiography	
Prophylaxis	
Fissure Sealants	
Impression Taking	
Administration of L.A	
Restorative Procedures	
Extraction	
Suturing Procedures	
Tooth Splinting	
Others... Specify	

### 3. dmft Distribution Table

55	54	53	52	51	61	62	63	64	65
85	84	83	82	81	71	72	73	74	75

<b>teeth</b>	<b>Crown</b>	<b>Status</b>
A	0	Sound
B	1	Decayed
C	2	Filled, with decay
D	3	Filled, no decay
E	4	Missing, as a result of caries
	5	Missing, any other reason

## **APPENDIX 2 : INDICES**

### **2.1. Dental Caries index (dmft, Klein, Palmer & Knutson)**

Criteria for identification of dental caries shall be done according to the WHO guidelines as follows: -

#### **Primary Teeth**

d=decayed and filled with decay

m=missing due to caries

f=filled

- No tooth shall be counted more than once
- Decayed, missing and filled teeth should be recorded separately.
- When counting the number of decayed teeth, also include those which have restorations with concurrent decay
- Care shall be taken to list as missing, only these teeth which have been lost due to decay. Those teeth, which are so badly decayed that they are indicated for extraction shall also be included. The following shall not be included as missing teeth:
  - a. Unerupted teeth
  - b. Teeth missing because of accidents
  - c. Teeth that have been extracted for orthodontic reasons
  - d. Teeth which have naturally exfoliated

The maximum score for any tooth is 1. A tooth may shall have several restorations, shall still counted as the same tooth.

Temporary restorations shall be considered as 'D'.

Only carious cavities shall be considered as 'D', the initial lesions (chalky spots, stained fissures, etc) are not considered as 'D'. For a tooth to be considered carious, the explorer shall penetrate into the carious tooth substance and not just in a deep groove.

### **2.2 Frankl Scale**

Rating 1. Definitely Negative. Refusal of treatment. Crying Forcefully. Fearful or any overt evidence of extreme negativism.

Rating 2. Negative. Reluctant to treatment. Some evidence of negative attitude but not pronounced.

Rating 3. Positive. Acceptance of treatment. At times cautious, willingness to comply with the Dentist at times with reservation but patiently follows cooperatively.

Rating 4. Definitely Positive. Good rapport with the Dentist. Interested in the procedure. Laughing and enjoying the situation.

### **2.3 The Modified Dental Scale.**

Each item scored as follows:

Not anxious=1

Slightly anxious=2

Fairly anxious=3

Very anxious=4

Extremely anxious=5

Total score is a sum of all five items, range 5 to 25: Cut off is 19 or above which indicates a highly dentally anxious patient, possibly dentally phobic

---

**1. If you went to your Dentist for TREATMENT TOMORROW, how would you feel?**

*Not Anxious*

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*Fairly Anxious*

*Very Anxious*

*Extremely Anxious*

**2. If you were sitting in the WAITING ROOM (waiting for treatment), how would you feel?**

*Not Anxious*

*Slightly Anxious*

*Fairly Anxious*

*Very Anxious*

*Extremely Anxious*

**3. If you were about to have a TOOTH DRILLED, how would you feel?**

*Not Anxious*

*Slightly Anxious*

*Fairly Anxious*

*Very Anxious*

*Extremely Anxious*



**4. If you were about to have your TEETH SCALED AND POLISHED, how would you feel?**

*Not Anxious*

*Slightly Anxious*

*Fairly Anxious*

*Very Anxious*

*Extremely Anxious*

**5. If you were about to have a LOCAL ANAESTHETIC INJECTION in your gum, above an upper back tooth, how would you feel?**

*Not Anxious*

*Slightly Anxious*

*Fairly Anxious*

*Very Anxious*

*Extremely Anxious*

### APPENDIX 3: CONSENT FORM

Dear Parent/Guardian,

I am a postgraduate student at the University of Nairobi, School of Dental Sciences, and pursuing studies leading to specialization in children's dentistry. I wish to request for your permission, for you and your child to participate in a study that will form part of my degree work. This participation is purely voluntary and you may withdraw from the study at any stage.

The study will involve requesting you to answer a few questions in a questionnaire. It will involve observing your child's behaviour during treatment. Lastly it will include looking inside your child's mouth to assess if there are cavities. This will be recorded and analyzed for research purposes only. The examination will be carried out using sterile (clean) instruments, No invasive procedures will be performed on you or your child during the study. However appropriate advice shall be given for any urgent treatment required. The results of the study shall be used to find the relationship between parental anxiety and your child's behaviour and caries experience. You are free to ask any Questions about my study if you require any clarification.

I would, therefore, appreciate your consent by signing here below.

I, **Dr Nicholas Gichu**, confirm that I have explained the relevant parts of the study to the participant.

Signed: \_\_\_\_\_ Date \_\_\_\_\_

I, **the participant**, confirm that I have understood the relevant parts of the study and do hereby give consent to participate.

Signed: \_\_\_\_\_ Date \_\_\_\_\_

## APPENDIX 4: ETHICAL APPROVAL



Ref: KNH-ERC/ 01/ 4625

### KENYATTA NATIONAL HOSPITAL

Hospital Rd. along, Ngong Rd.  
P.O. Box 20723, Nairobi.  
Tel: 726300-9  
Fax: 725272  
Telegrams: MEDSUP\*, Nairobi.  
Email: [KNHplan@Ken.Healthnet.org](mailto:KNHplan@Ken.Healthnet.org)  
1<sup>st</sup> August 2007

Dr. Nicholas Gichu  
Dept. of Paediatric Dentistry & Orthodontics,  
School of Dental Sciences  
University of Nairobi

Dear Dr. Gichu

REVISED RESEARCH PROPOSAL: "INFLUENCE OF PARENTAL ANXIETY ON CHILDREN'S  
BEHAVIOUR DURING DENTAL TREATMENT IN RELATION TO THE CARIES EXPERIENCE AMONG 3-5  
YEARS OLDS IN URBAN NAIROBI"  
(P143/6/2007)

This is to inform you that the Kenyatta National Hospital Ethics and Research Committee has reviewed and approved your revised research proposal for the period 1<sup>st</sup> August 2007 – 31<sup>st</sup> July 2008.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimen must also be obtained from KNH-ERC for each batch.

On behalf of the Committee, I wish you fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of database that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely

  
**PROF A N GUANTAI**  
**SECRETARY, KNH-ERC**

c.c. Prof. K.M.Bhatt, Chairperson, KNH-ERC  
The Deputy Director CS, KNH  
The Dean, School of Dental Sciences, UON  
Supervisors: Prof. Gladys N. Opinya, Dr. Edith Ngatia, Dr. Loice Gathece



REPUBLIC OF KENYA  
**MINISTRY OF SCIENCE & TECHNOLOGY**

Telegrams: "SCIENCE TEC", Nairobi  
Telephone: 02-318581  
E-Mail: ps@scienceandtechnology.go.ke

JOGOO HOUSE "B"  
HARAMBEE AVENUE,  
P.O. Box 9583-00200  
NAIROBI

When Replying please quote  
**Ref. MOST 13/001/ 37C 685/2**

12<sup>th</sup> October 2007

Nicholas Gichu  
University of Nairobi  
P.O. Box 30197  
NAIROBI

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on, *'Influence of Parental Anxiety on Children's Behaviour during Dental Treatment in Relation to the Caries Experience among 3-5 Years olds in Urban Nairobi'*

I am pleased to inform you that you have been authorized to carry out research in Nairobi for a period ending 31<sup>st</sup> December, 2009.

You are advised to report to the District Commissioner and the Provincial Commissioner, the Provincial Director of Education and the Provincial Medical Officer of Health Nairobi before embarking on your research project.

On completion of your research, you are expected to submit two copies of your research report to this office.

  
**M. O. ONDIEKI**  
FOR: PERMANENT SECRETARY

Copy to:

The Provincial Commissioner  
NAIROBI

The Provincial Director of Education  
NAIROBI

The Provincial Medical Officer of Health  
NAIROBI