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FACTORS INFLUENCING BEHAVIOUR PATTERNS IN 3-5-YEAR-OLD CHILDREN ATTENDING THREE PUBLIC PAEDIATRIC DENTAL CLINICS IN NAIROBI KENYA

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FACTORS INFLUENCING BEHAVIOUR PATTERNS IN 3-5-YEAR-OLD CHILDREN ATTENDING THREE PUBLIC PAEDIATRIC DENTAL CLINICS IN NAIROBI, KENYA

N.GICHU, G. N. OPINYA, E. NGATIA and L.W. GATHECE

ABSTRACT

Objective: To determine factors that influence behaviour patterns in 3-5year olds attending paediatric dental clinics.

Design: A descriptive cross-sectional study.

Setting: The School of Dental Sciences, University of Nairobi Dental Hospital, Kenyatta National Hospital, Dental Clinic, and the Lady Northey Children's Clinic

Subjects: Three hundred and thirty children aged 3-5 years who had been accompanied by their parents/guardians.

Results: Among the 330 children (174males and 156 females) examined those with 'Definitely negative' behaviour observed were 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 ($p=0.004$). Parents/guardians were accurately able to predict the behaviour of their children in the clinic ($p=0.00$).

Conclusion: Positive behaviour was significantly related to the age of the child and parents were able to accurately predict the behaviour of their children. Behaviour was also significantly related to previous clinical experiences of the child. Hence the dentists management of the child may result in negative or positive behaviour

INTRODUCTION

Dental treatment phobia is traditionally defined as an irrational and exaggerated fear of dentists and dental environment. 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 categorised, for example "fear of dentists" versus "fear of specific dental procedures" (1). The prevalence of fear has been found to vary in content, pattern and level of fear across different

cultures and across different populations (2). A worldwide prevalence of 3-43% for child dental fear has been reported (3) Firat et al. 2006 (4) 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 (3). Consistent findings show that greatest prevalence of high dental fear occurred for people who were female, in middle adulthood, from low socio-economic circumstances, who were dentate, visited the dentist less often and who had fewer remaining teeth (2). Younger people are also found to be more anxious than the older age group. Anxiety in parents, especially overly involved mothers, have been shown to be associated with anxiety being reflected in the children (4-6). 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 (4). This signifies that negative behaviour 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 (5).

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 pre-conceived misconceptions (5). Therefore, parental anxiety affects the behaviour of the child during dental treatment and ability of the child to cope (7). 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 (5,8). 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. 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 and dental behaviour 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.

MATERIALS AND METHODS

Study Area: The study was a descriptive cross sectional study. 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.

Study Population and sample size: The study population involved children aged 3-5 years and the accompanying parents/guardians. 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. The minimum sample size calculated was 319, however, 330 children and their accompanying parents/guardians were involved the extra numbers were to cater for attrition if any. All children and parents/guardians who met the inclusion criteria during the duration period of two months for data collection, were included in the study.

Instruments for Data Collection: The care giver respondents who met the inclusion criteria had a self-administered semi-structured questionnaire for data collection on socio-demographic information, previous clinical experience. The information was for assessing 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 divided the respondents into two categories of low and high anxiety. The questionnaire was administered to the parent before the child was treated by a 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 Frankle 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. Pre-coded clinical forms were used to collect data on behaviour and dental caries for both the caregivers and the children.

Intra and Inter-examiner variability and reliability for data: Data validation was obtained by the calibration of the principal investigator who was calibrated by the supervisor to calculate inter-examiner reliability and the Cohen's Kappa score of 0.95 was obtained for child behaviour while for dental caries a Cohen's Kappa score was 0.89 which was considered good consistency.

Variability: The intra-examiner variability was obtained through the pre-testing of the study instruments, tools and corrections done. The first ten cases were examined and thereafter a repeat

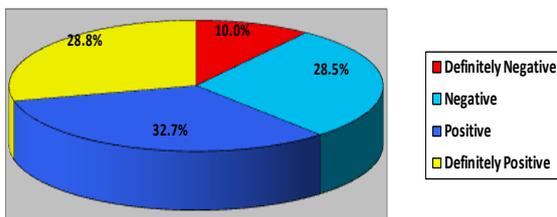
examination was done on every tenth subject and data from the repeated cases had the Cohen’s Kappa score of 0.91 was obtained for dental caries which showed good consistency.

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

RESULTS

Among most of the children observed, 108 (32.7%) had ‘positive’ behaviour, followed by 95 (28.8%) who had ‘definitely positive’ behaviour, 94 (28.5%) had ‘negative’ behaviour and only 33 (10%) had ‘definitely negative’ behaviour as is depicted in Figure 1.

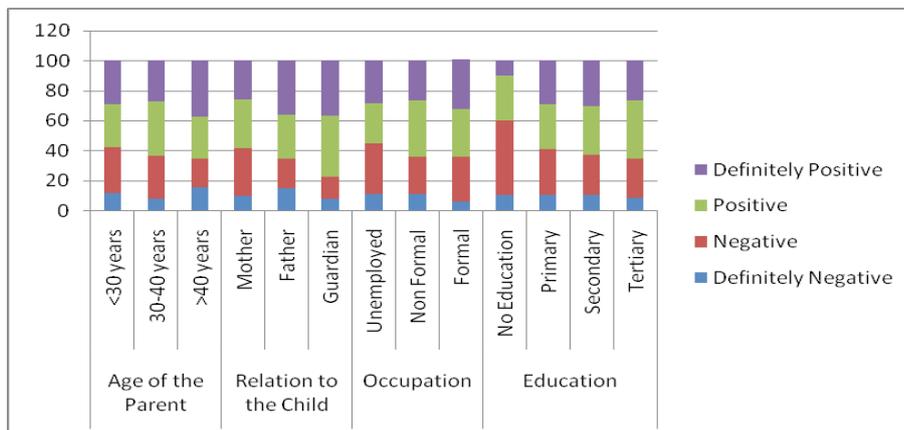
Figure 1
Pattern of child behaviour



The >40year-old parental age groups was found to have the highest percent 15 (15.6%) for ‘definitely negative’ behaviour. While 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 $p = 0.19$), (Figure 2).

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 (Figure 2).

Figure 2
Pattern of child behaviour in relation to socio-demographic variables 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 1.). However, this was not statistically significant ($\chi^2=4.54$, d.f 3 and $p=0.21$).

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 (Figure 3).

Children who had had a previous positive experience behaved poorer than those who had had a previous negative experience as is depicted in Table 2. Most of the children with a previous positive experience had negative behaviour 32(32.3%). In comparison, of those with a previous negative

Table 1
Child behaviour related to previous clinical experience of the parent

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

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 (Fig. III.). 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

experience, most had positive behaviour 22(57.9%). This distribution was statistically significant ($\chi^2 = 13.42$, d.f 3 and $p=0.004$, ($P \leq 0.05$)). 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 $p=0.00$, $P \leq 0.05$).

Figure 3
Child behaviour in relation to age and gender of the child

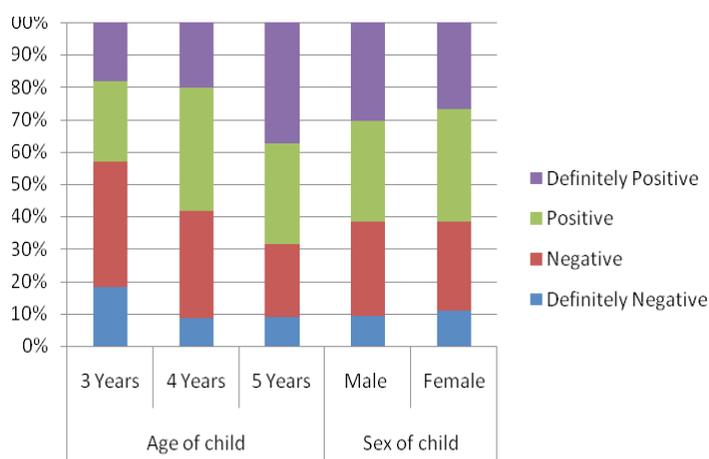


Table 2
Child behaviour related to previous dental visit experience of the child

Variable		Frankl 1 %	Frankl 2 %	Frankl 3 %	Frankl 4 %	Pearson Chi (χ^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%	

Parents with a previous positive experience had most of their children 56(34.1%) with a positive behaviour. (Table 3). 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 3
Child behaviour related to clinical experience of the parent/guardian

Variable	Respondents	Frankl 1 (%)	Frankl 2 (%)	Frankl 3 (%)	Frankl 4 (%)	Pearson (χ^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%	

The distribution of child behaviour varied with parental anxiety. (Table IV.) 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 ($\chi^2=3.04$, d.f 1 and p=0.08 $P \leq 0.05$).

Table 4
Distribution of Child behaviour and parental anxiety

Variable		Positive Behaviour n(%)	Negative Behaviour n(%)	Statistical Test Pearson Chi χ^2 p-value ≤ 0.05
Parental anxiety	Low	119 (93.7%)	8 (6.3%)	$\chi^2=3.04$ p=0.08
	High	198 (38.5%)	5 (62.5%)	

DISCUSSION

In this study 61.5% had positive behaviour as compared to 38.5% that had negative behaviour. Not many studies have been done on child behaviour during dental treatment especially for this age group, however, a study done in Western Washington State (9) 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 (9) had children with a mean age of 8 years. It is expected that older children are better behaved. In addition, the study (9) 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 (10), Lee *et al.* 2008 (11) who found a similar relationship to this study whereby behaviour was negatively associated with children's age. In Taiwan, Lee *et al.* 2008 (11) 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.* (12) who found that age had no relationship to child behaviour during tooth extraction. However, Johnson's study (12) 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 (10) and Lee *et al.* 2008 (11) 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 (12) who found that sex was not a contributing factor to child behaviour. 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 (11) and Johnson *et al.* 1968 (12) 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.

A significant relationship between behaviour that the parents predicted and behaviour rating of the child was established. In Nigeria, Bankole *et al.* 2002 (13) showed that mothers were able to predict the behaviour of their children. This was also similar to the study by Johnson *et al.* (12) implying that parents can accurately predict the behaviour of their children in the dental practice in our set up.

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 (13) 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.

REFERENCES

1. APA Diagnostic and Statistical Manual of Mental Disorders: DSM-IV, 4th edn. Washington DC: *American Psychiatric Association*, 1994.
2. Armfield, J. M, Spencer, A. J and Stewart, J. F. Dental Fear in Australia: Who's afraid of the dentist? *Australian Dental Journal*. 2006; 51: 78-85.
3. Folayan, M. O., Idehen, E. E. and Ojo, O. O. The modulating effect of culture on the expression of dental anxiety in children: a literature review. *International Journal of Paediatric Dentistry*. 2000; 14: 241-245.
4. Locker, D., Liddell, A., Dempster, L. and Shapiro, D. Age of Onset of Dental Anxiety. *J. Dent. Res.* 1999; 78: 790-796.

5. Klinberg, G., Berggren, U., Carlsson, S. G. and Noren, J. G. Child dental fear, cause-related factors and clinical effects. *Eur. J. Oral Sci.* 1995; **103**: 405-412.
6. Al-Khodair, I., Al-Balawi, S., Al-Khamis, H. and Marks, I. Dental phobia among Saudis. *Anxiety*. 1996; **2**: 140-144.
7. Versloot, J., Veerkamp, J., Hoogstraten, J. and Martens, L. Children's coping with pain during dental care. *Community Dent Oral Epidemiol.* 2004; **32**: 456-461.
8. Arnrup, K., Berggren, U., Broberg, A. G, Lundin, S. A. and Hakeberg, M.: Attitude to dental care among parents of uncooperative vs. cooperative child dental patients. *Eur. J. Oral Sci.* 2002; **110**: 75-82.
9. Baier, K., Milgrom, P., Russell, S., Mancl, L., Yoshida, T. Children's fear and behavior in private pediatric dentistry practices. *Pediatric dentistry*. 2004; **26**: 316-321.
10. Klorman, R., Michael, R., Hilpert, P. A. and Sveen, O. B. A Further Assessment of Predictors of the Child's Behavior in Dental Treatment. *J. Dent. Res.* 1979; **58**: 2338-2343.
11. Lee, C., Chang, Y. and Huang, S. The clinically related predictors of dental fear in Taiwanese children. *International Journal of Paediatric Dentistry*. 2008; **18**: 415-422.
12. Johnson, R. and Baldwin, D. C. Relationship of Maternal Anxiety to the Behaviour of Young Children Undergoing Dental Extraction. *J. Dent. Res.* 1968; **17**: 801-805.
13. Bankole, O. O, Denloye, O. O., Aderinokun, G. A and Jeboda, S. O. The relationship of children's predicted behaviour to their observed behaviour during dental procedures. *African Journal of Biomedical Research*. 2002; **5**: 109-113.