

ORIGINAL ARTICLE

Determinants of First Dental Visit in a Group of Sudanese Children: A Dental-Hospital Based Study

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ABSTRACT

Objectives: To assess the characteristics of the first dental visit in terms of age, chief complaint(s), treatment needed and anxiety level in a group of Sudanese children attending Pediatric Dental Clinics at Khartoum Teaching Dental Hospital (KTDH) & University of Khartoum (U of K). **Methods:** The study is a descriptive, cross-sectional, dental-hospital based study which was conducted in order to assess the determinants of the first dental visit in terms of age, chief complaint(s), treatment needed and anxiety level in a group of Sudanese children. A representative sample of 215 Children who attended the Pediatric Dental Clinics at Khartoum Teaching Dental Hospital & University of Khartoum was targeted. Data were collected prospectively between February to May 2010. A written questionnaire was completed by direct interview of the parents/or caregivers, followed by clinical examination for the chief complaint(s), during which the child's behavior was rated using the Frankl Behavior Rating Scale (FBRS). Radiographs; periapical views and DPTs, were taken whenever needed to confirm diagnosis of the chief complaint and to determine the treatment needed accordingly. The various chief complaints were categorized as follows, Orientation and prevention, Dental caries, Deposits / bad breath, Trauma, Pain/ sensitivity, Malocclusion, Missing/extra tooth, Soft tissue lesions, Swelling, Discoloration and Others. When dental caries was the chief complaint, it was further combined with other parameters (pain and/or swelling) to clarify its extent as follows; 'dental caries (without pain or swelling)', 'dental caries with pain', 'dental caries with swelling' and 'dental caries with pain and swelling'. **Results:** the median age for the first visit was found to be 7.08 years. Most common chief complaint for the visit was dental caries (74.42 %), of which dental caries and pain constituted the majority (44.65 %). Most of the children expressed Frankl level 3 (positive) during the clinical examination (57.21%). Extraction was found to be the treatment needed for almost half of the children at their first dental visit (46.98%). **Conclusions:** Sudanese children are brought very late to the pediatric dental clinics for the first time complaining mainly of caries and pain which necessitates invasive dental procedures (mostly extraction). The behavior rating during examination was found to be mostly Frankl 3.

Keywords: Age, first dental visit, Frankl behavior rating scale, treatment needed, chief complaint, dental caries, behavior rating .

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INTRODUCTION

Infant oral health is the foundation upon which preventive education and dental care must be built to enhance the opportunity for life time free of preventable oral diseases.¹ Over the past several years, much discussion has centered on the age at which a child without identified dental problems should first visit a dentist.^{2,3} Several dental professional organizations have offered a strong rationale for making that first visit by age 1 year.² A visit by age one may provide the opportunity to evaluate craniofacial and dental development, assess risk for common dental conditions, and counsel parents and caregivers on primary prevention interventions before disease progresses, poor habits become well established, or irreversible harm occurs.^{3,4} Preventive goals include improvement of the child's oral hygiene, correction of improper dietary and eating habits, improved knowledge of the role of non-nutritive sucking for the development of malocclusions, improved knowledge of the risks for traumatic injuries, including where, when and how to seek emergency care.⁵

The basic of practicing pediatric dentistry is the ability to deal with young children and to guide them through their dental experiences, and here comes the crucial role of the first dental visit as a foundation on which the anxiety level on subsequent dental visits is built. The dentist treating a child patient almost always assesses one aspect of behavior - cooperativeness. Cooperative behavior is the key to render treatment possible.

In pediatric dentistry, one of the most important skills for the dentist is to evaluate children's behavior.⁶ There are many behavior-rating scales available to assess and evaluate the behavior of a child on each dental visit. The child's behavior on every dental visit depends on many variables such as the age of the child, the behavior of and the psychological status of his/her mother or the accompanying parent (i.e. maternal/parental anxiety), if the child has a negative past medical experience (i.e. medical history), the child past dental experience (dental history), the awareness of the child of his/her dental problem, the type of the planned dental procedure, the behavior management approach and procedural techniques followed by the treating dentist.^{7,8}

For the evaluation of child behavior, the praxiological observation (Praxeology is the science of human action) and recording behavior have been used. Frankl et al. classified child behavior into four groups according to the child's attitude and cooperation or lack of cooperation during dental treatment.⁹ It consists of four ratings from definitely negative to definitely positive as follows; score 1 (refusal/distress), score 2 (uncooperative/reluctant), score 3 (cooperative/reserved), score 4 (interested/enjoyed).

Study questions

The age at which Sudanese children are brought to pediatric dental clinics for the first time is more than the international recommendation.

METHODS

The study was a descriptive, cross-sectional, dental hospital-based study which was conducted in the Pediatric Dental Clinics at Khartoum Dental Teaching Hospital (KTDH) and Faculty of Dentistry, University of Khartoum (U of K). These are the two major public pediatric dental clinics in Khartoum city.

A sample size of 215 children was targeted. This sample was calculated for level of significance of 0.05 and power equal 0.90 using equation provided for sample size with one proportion in Basic and Clinical biostatistics.¹⁰

The study was conducted in the period from end of February to mid of May 2010, and included all Sudanese children who attended the two clinics for their first dental visit and who were accompanied by their parents (or caregivers).

Written approvals of the University of Khartoum research committee and Khartoum Dental Teaching Hospital authorities were obtained. Verbal approval of children's parents (or caregivers) was also obtained before starting the interview after explaining the aim of the research and the dental examination that would be carried out.

A written questionnaire was completed by direct interview of the parents/or caregivers. The questionnaire included the following items:

- Demographic data of the child i.e. name, age, date of birth, gender, and address.
- The age of the child was determined by the last birthday.
- Educational levels and occupations of both parents.
- The reason(s) for the children's attendance were obtained from either older children or responsible caregiver in younger ones or both. The question asked was: 'What specifically made you come to our dental clinic today?'
- Chief complaint(s) was divided into the following categories: Orientation and prevention, dental caries, deposits /bad breath, trauma, Pain / sensitivity, malocclusion, missing / extra tooth, soft tissue lesions, swelling, discoloration and Other reasons.

When dental caries was the chief complaint, it was further combined with other parameters (pain and/or swelling) to clarify its extent as follows; 'dental caries alone '(without pain or swelling), 'dental caries with pain', 'dental caries with swelling' and 'dental caries with pain and swelling'. Clinical oral examination was performed for the chief complaint(s).

Radiographs; periapical views and DPTs, were taken whenever needed to confirm diagnosis of the chief complaint and to determine the treatment needed accordingly. The treatment needed was broadly classified into:

- a) Preventive measures; including dental education, oral hygiene instructions, dietary counseling, fluoride application and fissure sealants.
- b) Conservative treatment; including all types of restorations without the need for endodontic treatment.
- c) Pulp therapy; including endodontic therapy for primary, immature and mature permanent teeth.
- d) Extraction; whenever the tooth is considered unrestorable and contradicts the implementation of endodontic treatment.
- e) Others; include any other treatment not mentioned above and referrals to other departments.

When dental caries was the chief complaint, the treatment needed was assessed after careful history of the present complaint and clinical examination with or without radiographic recording (periapical views and DPTs). After completion of data collection, all

interviewed mothers/caregivers received dental information and dietary counselling as appropriate. In addition, all examined children received dental preventive measures, as well as the required treatment and/or appropriate referral for any comprehensive dental treatment.

FBRS was used to evaluate children's cooperativeness during examination of their chief complaint. All examinations and ratings were done by the same investigator.

The criteria of this scale are as follows:

Rating1: Refusal of treatment, crying forcefully, fearful, or any other evidence of negativism.

Rating2: Reluctant to accept treatment, uncooperativeness, some evidence of negative attitude but not pronounced.

Rating3: Acceptance of treatment, at time cautious, willingness to comply with the dentist, at time with reservation but patient follows the dentist's directions cooperatively.

Rating4: Good rapport with the dentist, interested in dental procedures, laughing and enjoying the situation.

Data analysis:

Two levels of data analysis were performed, descriptive and inferential. In the descriptive level, the data were summarized using standard statistical numerical and graphical summary tools. Then the inferential statistical techniques were used to test the relevant hypothesis and to construct confidence interval for the parameters under study. Amongst inferential techniques used, and since the age was not normally distributed, the Sign Rank test (nonparametric technique) was used to check if the age at the first dental visit complies with the international recommendations (1year of age). The variable age was grouped into four major groups to facilitate its correlation with other variables under the study. The age groups were as follows:

- Group I (0-3 years).
- Group II (> 3-6 years).
- Group III (>6-9 years).
- Group IV (>9-16 years).

For the analysis of the chief complaint(s) and the anxiety level, descriptive methods using proportions

and graphs were used. Stata (version 13) was used to facilitate the data analysis.

RESULTS

The median age of Sudanese children attending pediatric dental clinics of KTDH and Faculty of dentistry U of K for their first time was 7.08 years. The children’s age was divided into 4 groups; group 1 constitute children aged from 0-3 years, group 2 more than 3-6 years, group 3 more than 6-9 years and group 4 more than 9 years. More than 90% of the children were more than 3years of age. The least percentage of children (8.37%) belonged to the youngest age group (1-3 years) (Table 1).

Table 1: Age groups of the children at their first dental visit

Age group (years)	Freq.	%
1 to 3	18	8.37
More than 3 to 6	74	34.42
More than 6 to 9	76	35.35
More than 9	47	21.86
Total	215	100

The main reason for the subjects’ attendance of the pediatric dental clinics for the first time was dental caries (74.42 %), of which dental caries and pain constituted the majority (44.65 %) (Table 2).

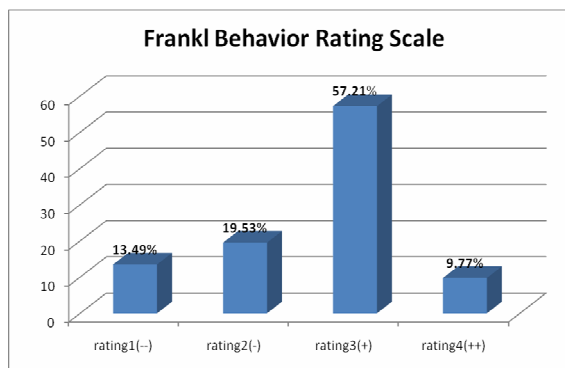
Classification of children anxiety level during the examination of their chief complaint based on the FBRS, showed that most of children were rated as level 3 (positive) (57.21%), followed by level 2 (negative) (19.53%), then level 1 (definitely negative) (13.49%) and the least is level 4 (definitely positive) (9.77%) (Figure 1).

The relationship between the different age groups and the behavior ratings during the first visit dental examination was statistically highly significant (Pearson Chi Square test) (Pearson $\chi^2(9) = 40.2043$, $P = 0.000$). The younger the child the more uncooperative he is (Table 3).

Table 2: Reasons for attendance at the first dental visit to pediatric dental clinics of KTDH and U of K.

Chief complaint	Freq.	%
Orientation + prevention	0	0.00
Dental caries	53	24.65
Dental Caries +pain + swelling	2	0.93
Dental caries + pain	96	44.65
Dental caries + swelling	9	4.18
Deposit/ bad breath	1	0.47
Trauma	12	5.58
Pain / sensitivity	0	0.00
Malocclusion	5	2.32
Missing/ extra tooth	2	0.93
Soft tissue lesion	12	5.58
Swelling	11	5.12
Discoloration	5	2.32
Others reasons	7	3.26
Total	215	100 %

Figure 1: Anxiety level as rated by FBRS



The study showed that almost half of children (46.98%) who attended the two pediatric dental clinics for the first time needed extraction as treatment for their chief complaint, followed by pulp therapy (37.67%) (Figure 2). Most of the other treatment category included referral to orthodontic and surgical departments (Figure 3).

Table 3: Correlation between the behavior rating scale and age groups

Age group	Frankl Behavior Rating				Total (%)
	Rating 1 (--)	Rating 2 (-)	Rating 3 (+)	Rating 4 (++)	
1-3	38.89%	27.78%	27.78	5.56	100
>3 to 6	20.27	29.73	44.59	5.41	100
> 6 to 9	7.89	14.47	61.84	15.79	100
>9	2.13	8.51	80.58	8.51	100
Total	13.49	19.53	57.21	19.77	100
P- value = 0.000					

Figure 2: percentages of different types of the treatment needed of children brought to pediatric dental clinics for their first dental visit

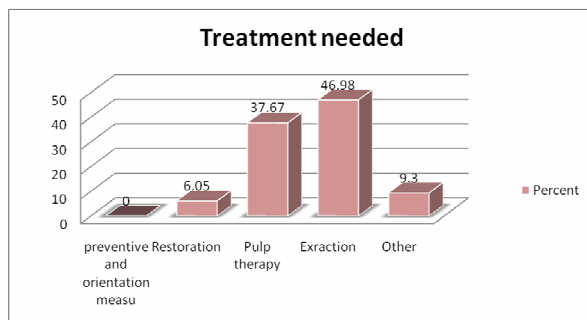
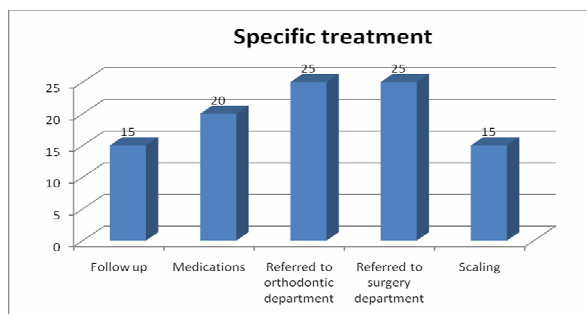


Figure 3: Specific other treatment needed at first dental visit



DISCUSSION

The median age at the first dental visit of our study population was 7.08 years, most children falling in the

age group of (>6-9 years). Only 8.37% of the children were below 3 years of age, while 91.63% were older, within which one child in every 5 had visited the pediatric clinic for the first time after the age of 9. This was not in accord with the international recommendations, which recommend the age of the first dental visit to be around the child's first birthday. However, other investigators¹¹⁻¹⁶ reported similar results in the literature.

When children and /or parents were asked about their chief complaint(s), the majority reported dental caries (74.42%), within which, dental caries combined with pain constituted the majority. These results are in agreement with those reported by Meera *et al.*(2008) in both his prospective and retrospective studies¹¹. Although 94.88% of parents thought that preventive dental visits are important and 72.09% agreed that primary teeth are important for every child, none came for prevention or orientation visit (0.00%).

Behavior of children attending for the first dental visit evaluated using FBRS showed that more than half of children were rated as level 3 (+), followed by level 2 (-), level 1 (--), and the least were classified as level 4 (++) . Similar results were obtained from a study conducted by Shinohara *et al.*(2005)¹⁷ and Colares *et al.*(2002).¹⁸ However, Tenabe *et al.*(2002) reported that level 3 was the most frequent classification, followed by level 4, 1 and 2 in children aged 5-12 years.^{17,19} In our study, however, two thirds of the children aged 1-3 were rated as (--) or at least (-).

This study revealed a statistically significant relationship between children's behavior and the age of the child; the older the child the more cooperative he/she is. These results coincide with findings of other studies^{17, 18}. Nevertheless, these findings contradict those of Tolendano *et al.*, (1995) who failed to find a statistically significant relationship between level of cooperativeness and the age factor.²⁰ This contradiction might be due to the fact that Tolendano *et al.*, addressed an older age group (8-16 years), compared to our median age (7.08 years).

The international goal of first dental visit is to assess the risk for dental diseases, initiate preventive programs, provide anticipatory guidance and decide on the periodicity of other visits. It should be a completely painless visit, where the child is introduced

to the dental environment. However, it was found that almost half of the subjects of this study needed extraction as treatment of choice for their chief complaint at this visit, followed by pulp therapy. None of the children under the study needed preventive measures only. Moreover, the study succeeded to uncover a significant association between the age and the treatment needed at the first dental visit; the older the age, the more invasive is the treatment needed. So instead of being a preventive and orientation visit, it changed into an invasive and emergency visit. These results coincide with findings of Clemencia & Cynthia and Al-Shalan et al.^{21,22}

CONCLUSIONS

The median age at the first dental visit of Sudanese children does not follow the international recommendations (7.08 years). Orientation and prevention are not considered and preventive dentistry is yet to reach the common population in Sudan. Dental caries and pain were found to be the main reasons for seeking dental care for the first time. The preventive goal of the first dental visit could not be accomplished in Sudanese children, since extraction was found to be their treatment of choice at this visit, and was found to be related to the age factor. Most of the children expressed Frankl level 3 during their dental examination. And significant relationship existed between children's behavior and their age; the younger the child, the less cooperative he/she was. The present study concluded that Sudanese children receive their first professional dental care very late with all its consequent complications. Dental and medical professionals should call attention to the vital role of early first dental visit utilizing community health programs which include parents and other caregivers. This can easily be achieved if primary oral health care becomes an integral part of primary general health care. Furthermore, adopting the concept of "Dental Home" which should be established by all parents (care givers) for their infants by one year of age.

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Authors' contributions

MME and FEE both contributed to the design and project set up. MME proposed the idea for the research, wrote the initial framework, and drafted the Manuscript as the principal author. FEE revised the original research. Both authors approved the final manuscript. MME submitted this thesis in partial fulfillment for the requirements of the degree of M.Sc. (Sudan) in Pediatric Dentistry.

Abbreviations

AAP, American academy of pediatrics; AAPD, American Academy of Pediatric Dentistry; CI, confidence Interval; DPT, Dental Panoramic Tomography; ECC, Early childhood caries; FBRS, Frankl behavior rating scale; KDTH, Khartoum teaching dental hospital; MCH, Maternal and child health; OR, Odd Ratio; SE, Standard Error; U of K, University of Khartoum.

Competing interests

The authors declare that they have no competing interests.

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