

Oral Health Status among Refugees and Internally Displaced Children (3-11 Years Old) from Western Kordofan State, Sudan

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Abstract

Background: Refugees and internally displaced children are often fed food with a low nutritional value or high in carbohydrates, predisposing them to a relatively higher risk of dental caries, and periodontal diseases. **Objectives:** The aim of this study was to assess the oral health status among a group of refugees and displaced children. **Materials and Methods:** A descriptive cross-sectional study among (172), 3–13-year-old children (59 boys (34.3%) and 113 girls (65.7%) from in Almoshama camp for displaced and refugees coming from different areas of Sudan and outside Sudan. The participants were selected by non-probability sampling technique based on convenient accessibility and availability of children from friendly child spaces in the camp. Dental caries was assessed by dmft for primary teeth and DMFT for permanent teeth, while periodontal status was assessed by community periodontal index (CPI). Comparison between different non-parametric data was done by Chi-Square test and parametric data by student T-test, with the level of statistical significance difference set at P-value ≤ 0.05 . **Results:** The prevalence of dental caries among the participants was 33.3%. The mean \pm SD dmft score was 2.28 ± 1.77 and the DMFT score was 1.63 ± 1.51 . A statistically significant difference in mean DMFT between different age groups (P=0.004) and between boys and girls (P=0.03). While the mean CPI was 0.73. Almost half of the participants had periodontal diseases (54.1%) of whom 37.2% had gingival problems, 14.5% calculus, and only 2.32% have pocket problems. **Conclusions:** High prevalence of untreated dental caries and periodontal diseases among Refugees and internally displaced children living in Almoshama camp in West Kordofan, Sudan. Emphasis on motivation in oral health promotion campaigns and provision of primary health care services among those vulnerable groups is paramount.

Key words: dental caries, periodontal diseases, oral hygiene, school children.

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INTRODUCTION

Since World War II the number of refugees and IDPs reach to more than 50 million people [1]. Recently, Sudan has become a major hosting country where up to 4,000,000 people were forcibly displaced from their homes as internally displaced people (IDPs) and they are spreading all over Sudan. Also, there are up to one million refugees, living mainly in camps and cities, as they come from neighboring countries such as Southern Sudan, Eritria, Uganda, Central Africa Republic, Ethiopia, and Egypt [2].

Refugees and IDPs children are often fed food with a low nutritional value or high in carbohydrates,

predisposing them to a relatively higher risk of malnutrition [3].

Dental caries and periodontal diseases occurrence is closely associated with poor oral health habits, such as frequent sugar or soft drink intake, not brushing teeth regularly, no exposure to fluoride, and inadequate oral health care [4]. It was hypothesized that lack of oral health knowledge and awareness, poor access to effective oral diseases prevention programs, and inadequate dental care services in the refugees and IDPs could contribute to the high dental caries and periodontal diseases prevalence. Oral health status among refugee and displaced children has been studied in different areas in the world with unfortunate results of poor status [5-10], but there are no previous studies tackling this issue in Sudan.

The main objective of this study was to determine the prevalence of dental caries and periodontal disease among refugees and displaced children, while the specific objectives were to assess dmft and DMFT index and determine the prevalence of periodontal disease using community periodontal index (CPI) according to different age groups and gender.

MATERIAL AND METHODS

A descriptive cross-sectional study among 172 children in Al-Moshama camp in West Kordofan, Sudan. The age group was from 3 to 13 years old. In this study the participants were selected by non-probability sampling technique based on convenient accessibility and availability from friendly child spaces in Almariam, West Kordofan, which included refugees and IDPs children of different ages.

The DMFT/dmft Index (according to WHO criteria 1997) was obtained by examining the child visually in an upright chair, under daylight, and a No. 4 plain mirror. The sum of how many teeth were: decayed, missing, and filled was measured. The maximum number for an individual DMFT score for permanent teeth was 28, while for deciduous or primary teeth, the maximum dmft score for an individual was 20 since primary dentition had a maximum of 20 teeth. Community Periodontal Index (CPI) according to WHO criteria 1982 was used to measure periodontal disease. A specially designed CPI probe was used, which has a 0.5mm diameter ball at its tip, a blank band for visibility between 3.5 and 5.5 mm, and a ring at 8.5 and 11.5mm from the ball tip. The purpose of the ball end was to assist in detecting sub-gingival calculus and to help prevent the probe from being pushed through inflammatory tissue at the base of a pocket. The probing pressure used was about 20 grams. For a treatment need survey, the mouth was divided into sextants. A sextant was examined only if there are two or more teeth present and not indicated for extraction. When only one tooth remains in a sextant, it was included in the adjacent sextant. The tooth surfaces that were assessed

are buccal of the upper molars, the lingual of the lower molars and lower incisors, and the labial surface of the upper incisors. Codes and Criteria Used in CPI as follows: 0 Healthy, no disease 1=Gingival bleeding observed no pocket, no calculus. 2=Sub-gingival calculus present, no pocket > 3 mm. 3=Pocket present 4 or 5 mm deep. 4=Pocket > 6mm (black area of probe not visible).

The study was approved by Ethical Committee of the University of Medical Sciences and permission was sought from the commission of refugees (COR) to carry out the study. Informed written consent was obtained from the participant's guardians prior to any interviews or examinations being conducted with benefits and services that could be received while participating in this study. Participation in this study was entirely voluntary and the participants were allowed to withdraw from the study at any time. It was emphasized that strict confidentiality was maintained at all times and that no names or personal details were used in the write-up of the study.

RESULTS

The total number of participants in this study was 172 children. The sample consisted of 59 boys (34.3%) and 113 girls (65.7%). The age of the participants ranged from 3 to 13 years old and the percentage of children examined according to age group (3 to 5), (6 to 10), and (11 to 13) were 58 (33.7%), 66 (38.4%) and 48 (27.9%) respectively. The distribution by areas revealed that 96 (55.8%) were Sudanese (IDPs), while 76 (44.2 %) were from neighboring countries.

The mean dmft was 2.28 ± 1.77 which was mainly from the mean (d) component (2.23 ± 1.71) and it was the highest among other components in deciduous teeth, as 89% of children had decayed teeth. Regarding the permanent teeth, the mean DMFT was 1.63 ± 1.51 which equals the (D) component, and the percentage for these decayed teeth was 78.9% as displayed in table 1.

Table-1: Mean and percentage of decayed (d), missing (m), and filled (f) teeth in deciduous dentition and the mean and percentage of Decayed (D), Missing (M), and filled (F) in permanent dentition.

Index	Mean	SD	Percentage	Maximum
D	2.23	1.71	89	10
M	0.05	0.25	4.7	2
F	0	0	0	0
Dmft	2.28	1.77	0	10
D	1.63	1.51	78.9	8
M	0	0	0	0
F	0	0	0	0
DMFT	1.63	1.51	0	8

The mean dmft of age group 3-5 years old was the highest (2.66 ± 2.34) and for 6-10 was the lowest

(1.98 ± 1.28), while the overall percentage of prevalence dental caries for children age 13 and less is 33.3%

(table 2). The mean DMFT was greatest among the age group of 11-13 years old, which was highly statistically significant $P=0.004$ (table 3). While according to the

sex, the mean DMFT showed a statistical significance difference $P=0.03$ between boys and girls (Table 4).

Table-2: Mean dmft according to different age group 3-5, 6-10 and 11-13 years old.

Index	Age	N	Percent	Mean	SD	P value
dmft	3 to 5 years	58	33.7	2.66	2.34	0.107
	6- 10 years	66	38.4	1.98	1.28	
	11 – 13 years	48	27.9	2.25	1.48	

Table-3: Mean DMFT according to different age group 3-5, 6-10 and 11-13 years old.

Index	Age	N	Mean	SD	P value
DMFT	3-5 years	-	-	-	
	6 - 10 years	66	1.24	0.91	0.004**
	11 – 13 years	48	2.17	1.96	

Table-4: Mean dmft&DMFT according to gender

Index	Gender	N	mean	SD	P
Dmft	Boy	59	1.93	1.63	0.051
	Girl	113	2.47	1.82	
DMFT	Girl	81	1.83	1.63	0.03*
	Boy	33	1.15	1.03	

A statistically significant difference was found between the mean percentage of dmft between boys and girls as shown in (table 5).

Table-5: The percentage of decayed, missing and filled teeth according to gender

Index	Gender	N	Mean	SD	P value
d percentage	Boy	59	4.98	8.93	0.002**
	Girl	113	13.46	19.66	
m percentage	Boy	59	0.17	1.30	0.414
	Girl	113	0.35	1.38	
f percentage	Boy	59	0	0	-
	Girl	113	0	0	

The overall periodontal status results showed that the mean of CPI was 0.73, with a percentage of 54.1% had periodontal diseases distributed as follows 37.2% had gingival problems, 14.5% had calculus and

only 2.32% had pocket problems. The mean CPI in refugees (1.55) was higher than CPI in IDPs (0.63) table 6.

Table-6: Community Periodontal Index measures among Refugees and Internally displaced children according to the age group (11-13).

Group	Index	Age	N	Mean	SD	P value
IDPs	CPI	11-13	19	0.63	0.76	0.003
Refugees		11- 13	29	1.55	0.87	

IDPs: Internally Displaced Children, CPI: Community Periodontal Index

DISCUSSION

Oral health is an essential part of overall health and quality of life; hence requires close monitoring of refugees and IDPs due to their situation and greater unmet dental healthcare needs [11]. Improving the oral health of refugees and IDPs is one of the challenges that the Sudanese government and non-governmental organizations (NGOs) encounter; due to the lack of availability and affordability of the health services. It is

a moral and ethical obligation as well as a duty to care about those vulnerable groups of people.

Compared with the goal described in the Oral Health Goals in 2020 established by the WHO that 50% of children aged 5 should be caries-free; the prevalence of dental caries of present study among Refugees and IDP children is within that range [11].

The severe dental caries status of Refugees and ID children may be due to inadequate exposure to fluoride and inadequate or no brushing. Nevertheless,

the prevalence of dental caries among these children (dmft: 2.28) has nearly similar mean dmft of preschool children from Khartoum, Sudan [12-14]. Moreover, the prevalence of dental caries in refugees' children in this study; although is considered high, was low when compared to those of nearby; middle East countries, Australia, Spain, and Canada [5, 6, 15, 16].

The high prevalence of dental caries among those groups of children might be due to limited medical and dental services. In addition, all of these children had never visited a dentist, and the low awareness regarding children's dental health among the caregivers might be one of the reasons. A substantial portion of decayed teeth was left untreated among refugees and ID children. This portion of untreated caries was remarkably higher than that of some developed countries like Canada and Spain [6, 15]. Socioeconomic status and oral health care systems might account for such differences in the prevalence of untreated caries, as these services are not available for the refugees and IDPs and if they are being referred they need to pay the high costs out of their pockets for dental treatment, which would further limit their access to dental services. Oral health promotion programs, such as the Comprehensive Intervention on Children's Oral Diseases in the Central and Western Regions Project and the Oral Health Promotion and Oral Medicine Development West Action Plan, could be conducted in their areas of living.

Amongst this study population, the D/d (decayed) was the predominant component of the DMFT/dmft especially in the age group 11 to 13. The high level of untreated dental caries in the above populations reflects low utilization of dental services, which may be as a result of limited access to dental care in terms of cost and availability. This corroborates the fact that untreated dental caries is experienced much more often by socio-economically disadvantaged children. Moreover, other challenges such as low oral health workforce, inadequate oral health facilities, and most dental clinics are located in urban settings; so rural children who need dental care may have to visit a dentist in a major neighboring.

The findings of the present study showed that more than half of the examined who has Periodontal problems were children aged from (11-13), however, the percentage of bleeding was found to be increased with age and the percentage of the calculus was greater in older children and two-third of children have dental plaque, which is normal when compared with other [17].

LIMITATION

The study however had certain limitations, among which the use of convenience sampling instead of randomized cluster sampling made the study sample less representative. In addition, the sampling procedure

may have led to a selection bias, as study participants recruited in private practices may tend to have a higher occurrence of dental disease in comparison to those recruited in refugee shelters. Also, the sensitivity of field oral examinations (for obtaining DMFT scores in particular) without the use of extra diagnostic methods like bitewing radiographs, may have led to underestimating the prevalence of caries and to increase false negative values especially for caries on the proximal surfaces. In addition, it was only feasible to examine the intra-rater reliability for participants recruited in private practices (a convenience sample). This may have put the resulting intra-class correlation coefficient at risk of bias.

CONCLUSION

The present study revealed a high prevalence of untreated caries and poor oral hygiene. The decayed components (d/D) constitute the major part both in caries prevalence of primary and permanent teeth. Thus, the need for restorative care like filling and pulpal care formed the bulk of treatment needs. This study provided baseline data, for the planning of maintenance of oral health status among those vulnerable groups of children.

Conflict of interest: All authors declared no conflict of interest.

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