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Research Article

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Oral Health Status and Habits among 6 - 13 Years Old Children with Limited Access to Dental Care in South Jeddah

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ABSTRACT

The objective of this research was to assess oral health status and habits and to explore potential risk factors for dental caries among 6-13 years old children with limited access to dental care. A cross-sectional design was used to screen a sample of 563 intermediate school children with limited access to oral health care in the Al-Khomrah district, south Jeddah, Saudi Arabia. A stratified random sample was selected and data was collected using an interview questionnaire with extraoral and intraoral examination. The examination aimed at detection of oral health conditions regarding oral hygiene status, habits, decayed, missing and filled teeth and treatment needs. Treatment of simple and emergency cases was performed in the mobile clinic and severe cases were referred to King Abdulaziz University, Faculty of Dentistry (KAUFD). The study included 262 males (46.5%) and 301 females (53.3%) with a mean age of 10.99 ± 2.07 years. The prevalence of decayed, missing or filled primary teeth was 59.1%, 2.5%, and 3.4%, respectively. The corresponding values for permanent teeth were 65.9%, 4.3% and 7.6%, respectively. Males had significantly higher prevalence of caries than females. The younger age groups, in case of primary teeth and the older age groups, in case of permanent teeth had significantly higher prevalence of dental caries. The median dmft (95% CI) was 2 (1-2) and the median DMFT (95% CI) was 2 (2-3). Multinomial multiple logistic regression indicated that intensity of primary teeth caries decreased with increasing age and brushing teeth at least once a day and increased with male gender, living in rented house or having poor oral hygiene. As regards permanent teeth, the likelihood of having more severe caries increased by child's age, below secondary school educated fathers and/or mothers, being a male, and with poor oral hygiene. Dental caries prevalence and intensity were moderate among the examined group. Males had significantly higher caries prevalence and intensity than females.

Key words: *Oral Health, Dental Decay, Children, Oral Habits, Limited Access.*

INTRODUCTION

Good oral health is important to maintain general health and well-being. It is a condition of being free from oral and facial pain, mouth and throat cancer, dental infection and sores, periodontal disease, caries, tooth loss, and other diseases and disorders that limit a person's ability in eating, smiling, speaking, and psychosocial well-being. Dental caries is the most common chronic disease; it is seven times more common than seasonal allergies and five times more common than asthma [1].

The prevalence of oral disease differs by geographical area, and accessibility and availability of oral health facilities. Social factors in oral health are also highly important. The prevalence of dental diseases is rising in low- and middle-income nations, and in all nations, the oral disease load is notably increased between needy and deprived communities [2].

The majority of dental diseases require professional oral care, however, because of compromised availability, the utilization of dental health facilities is significantly decreased among persons residing in countryside, older individuals, persons with decreased salaries and education and school children with poor access to dental care services [3, 4].

With current comprehension in social sciences, it has been accepted that dental health is affected by several environmental and social elements. One element is approachability to oral health care services. Restricted access to dental careis is affected by community, the patient standard and oral health care provider. However, standard care delivery is essential, and gaining access to oral health is an evenly significant factor of oral health [5].

While, Saudi Arabia has a significant number of faculties in the world, there is obvious discrepancy in the allocation of these colleges. Geographic imbalances in the accessibility of oral health care facilities influence the dental practitioner-community proportion. The majority of the Saudi Arabian people who lives in rural districts has poor access to dental care services. The impact of poor access to oral health care facilities is also higher on special people like children. They rely totally on their parents to make use of the health care facilities [5, 6].

The objective of this research was to evaluate oral health status and habits and to explore potential risk factors for dental caries among 6-13 years old children with poor access to oral health care in the Al-Khomrah district, south Jeddah, Saudi Arabia.

MATERIALS AND METHODS

The current study was a cross-sectional clinical research conducted during the period of 2015-2016. It included 563 intermediate 6-13 years old school children (46.5% males and 53.3% females) with a mean age of 10.99 $\pm$ 2.07 years.

Target population:

Intermediate schools' students in low socioeconomic districts in south Jeddah, Saudi Arabia.

Study setting:

Intermediate schools of selected districts.

Study design:

A descriptive cross-sectional research was performed to assess the oral health status and habits and to explore potential risk factors for dental decay among intermediate school children that had poor approach to dental health services in low socioeconomic areas in south Jeddah.

Sampling:

A stratified random sample was chosen, where stratification is by gender and age. A list of all male and female governmental schools was obtained for the target region. Two schools were selected randomly from each stratum and all students in the selected schools with written consents were incorporated in the research and examined.

The sample size was calculated utilizing G*Power version 3.1.5 by applying an anticipated dental decay prevalence of 50%, a design effect of 1, an effect size of 0.05, 95% confidence level, and 80% power. The minimum required sample size after adjusting for 20% non-response was 500 students.

Data collection technique and tools:

1. **Questionnaire design and development:**

   A well-organized questionnaire was designed and constructed based on a comprehensive literature review. The questionnaire presented demographic information andpertinent medical history. Dental history was also obtained regarding oral hygiene status, habits, decayed, missing and filled teeth and frequency of dental visits.

2. **Oral examination:**
   Intraoral and extraoral examination was performed. Oral hygiene status, habits, dentition status, decayed, missing and filled teeth and treatment needs were detected. Four qualified practicing dentists following "World Health Organization (WHO)" diagnostic criteria performed clinical dental examination of the children. All examinations were done in the mobile dental clinic [7].
3. **Treatment:**
   Cases who needed simple or emergency treatment, were treated onsite except complicated cases that needed hospital treatment were referred to KAUFD hospital.

Statistical analysis:

Prevalence of caries was computed as the percentage of students with any tooth decayed, missing or filled. The total decayed, missing and filled primary (dmft) or permanent (DMFT) teeth, was calculated to estimate caries intensity. The associations between categorical variables and prevalence of dental caries were tested using the Chi-square test. The mean age was compared between males and females using the t-test. As the distribution of dmft/DMFT was not normal, box plot was used to demonstrate the median caries intensity by age and gender, where comparison among age groups with each gender was done using the Kruskal-Wallis test. Comparison of the distribution of dmf/DMF by gender within each age group was performed using Mann-Whitney test. Odds ration with its 95% confidence interval was calculated to estimate the likelihood of dental decay by socio-demographic data, and oral hygiene. Univariate and multivariate multinomial logistic regression was done to explore the potential predictors of the intensity of dental decay. To minimize the effect of confounders, only factors which were significant in univariate analysis were introduced into the multivariate analysis. A P value $\leq$ 0.05 was decided as a cutoff for statistical significance and all tests were two-sided. Data were analyzed using IBM SPSS 20 "IBM, Armonk, NY, USA".

Calibration of clinical examination was performed before clinical examination and was verified by inter-examinerand intra-examiner agreements, where values ranging from 0.75 to 0.866 for inter-examiner and from 0.933 to 0.989 for intra-examiner agreement were obtained.

Ethical approval:

This research was performed in compliance with all policies of appropriate patient care at King Abdulaziz University (KAU). The Ethical Committee at the KAUFD approved the research protocol (REC-FD # 006-15). A written informed consent was secured from the parents prior to clinical examination of their children.

RESULTS

Demographic characteristics of students by gender is shown in Table 1. The current study included 563 children; 46.5% boys and 53.3% girls with a mean age of 10.99 $\pm$ 2.07 years. A considerable percentage of students' fathers and/or mothers had less than a secondary level of education (43.6% and 55.5% respectively). Males and females were not significantly different by educational level of fathers but males showed significantly higher percentage of mothers below secondary level of education (about 60%) compared to females (about 50%). Regarding father and mother working status, 16.7% of fathers and 79.7% of mothers were non-working. About 7% of students were non-Saudi and 21.2% reported rented residence with significantly more non-Saudis among boys.

Table 2 shows that boys and girls were significantly different in daily tooth brushing, dental visits and Oral Hygiene Index (OHI). The females who brush their teeth two times daily are significantly more than males (40.5% and 30.2% respectively), while the percentage of males who never brush their teeth are significantly higher than females (23.3% and 7.6% respectively). Generally, most of the students did not visit a dentist (49.9%) or visited a dentist only when indicated (41.7%). Males who never visited a dentist constituted 56.9% with significant difference from females (43.9%). Considering Oral Hygiene Index-Soft deposit (OHI-S), boys who had perfect oral hygiene are significantly more than girls (40.5% and 11.3% respectively).

The prevalence of decayed primary teeth (Table 3) was 59.1%, that was significantly higher in males (66.4%) than females (52.8%). Missing and filled teeth were recorded in 2.5% and 3.4% of cases respectively with no significant difference between males and females.

The prevalence of decayed, missing and filled permanent teeth, revealed a prevalence of 65.9%, 4.3% and 7.6% with significant difference between males and females in the decayed component only ($P < 0.001$).

A significant decreasing trend of decayed primary teeth by age was observed from 86.5% at the age of 6 $\leq$ 8 years down to 39.6% at the age of 12-13 years. An opposite sequence might be seen for decayed permanent

teeth, where the percent increases from 25.0% at the age of 6 ≤ 8 years old up to 82.6% at age 12-13 years old. Similar trends were observed for missing and filled teeth whether primary or permanent.

Table 1. Demographic characteristics of students by gender

Characteristics		Males		Females		Total		X^2	P
Overall		262	46.5	301	53.5	563	100.0		
Age (Years)	6-	33	12.6	19	6.3	52	9.2		
	8-	29	11.1	48	15.9	77	13.7		
	10-	58	22.1	88	29.2	146	25.9		
	12-13	142	54.2	146	48.5	288	51.2		
	Mean (SD)	10.99	2.23	10.99	1.93	10.99	2.07	t = 0.01	0.995
Father's Education◈	No education	31	13.4	22	10.9	53	12.2		0.206
	Primary school	26	11.2	37	18.3	63	14.5		
	Intermediate school	38	16.4	35	17.3	73	16.8	5.91	
	Secondary school	70	30.2	62	30.7	132	30.4		
	University or higher	67	28.9	46	22.8	113	26.0		
Mother's education⁂	No education	47	20.4	37	15.7	84	18.1		0.029
	Primary school	47	20.4	41	17.4	88	18.9		
	Intermediate school	48	20.9	38	16.2	86	18.5	7.76*	
	Secondary school	41	17.8	71	30.2	112	24.1		
	University or higher	47	20.4	48	20.4	95	20.4		
Fathers' work✱	Yes	221	86.3	237	80.6	458	83.3	3.21	0.073
	No	35	13.7	57	19.4	92	16.7		
Mothers' work✋	Yes	50	19.5	63	21.0	113	20.3	0.18	0.668
	No	206	80.5	237	79.0	443	79.7		
Citizenship	Saudi	238	90.8	288	95.7	526	93.4	5.35*	0.021
	Non-Saudi	24	9.2	13	4.3	37	6.6		
Residence	Owned	197	77.3	233	80.1	430	78.8	0.64	0.423
	Rented	58	22.7	58	19.9	116	21.2		

◈30 males and 99 females with missing fathers' education
⁂32 males and 66 females with missing mothers' education
✱6 males and 7 females with missing fathers' work
✋6 males and 1 female with missing mothers' work
* P<0.05 (Significant)

Table 2. Oral hygiene status and habits of students by gender

Characteristics		Males (n = 262)		Females (n = 301)		Total (n = 563)		X^2	P
Daily tooth brushing	Twice	79	30.2	122	40.5	201	35.7	35.95*	<0.001
	Once	57	21.8	47	15.6	104	18.5		
	Not frequently	65	24.8	109	36.2	174	30.9		
	Never	61	23.3	23	7.6	84	14.9		
Miswak	Yes	81	30.9	75	24.9	156	27.7	2.46	0.117
	No	181	69.1	226	75.1	407	72.3		
Tooth flossing	Yes	11	4.2	22	7.3	33	5.9	2.52	0.113
	No	251	95.8	279	92.7	530	94.1		
Dental visits	Every 6 months	10	3.8	7	2.3	17	3.0	23.58*	<0.001
	Every 12 months	14	5.3	5	1.7	19	3.4		
	Irregular	6	2.3	5	1.7	11	2.0		
	When needed	83	31.7	152	50.5	235	41.7		
	Never	149	56.9	132	43.9	281	49.9		
OHI-S (Soft deposit)	<1 (Good)	106	40.5	34	11.3	140	24.9	63.82*	<0.001
	1- (Fair)	114	43.5	198	65.8	312	55.4		
	2+ (Poor)	42	16.0	69	22.9	111	19.7		

* P<0.05 (Significant)

Figure 1 illustrates the median dmft/DMFT by age and gender. Dental caries shows significantly and consistently higher intensity among males than females and among the younger age groups for primary teeth and the older age groups for the permanent teeth.

Overall, primary teeth caries prevalence was 59.7% and was significantly associated to gender, age, father's education, residence, and daily tooth brushing (Tables 4 and 5). Higher risk of dental caries was observed among females, younger students, with university educated fathers in contrast to intermediate school education, those with rented houses and those who did not brush their teeth frequently. Permanent teeth on the other hand, showed caries prevalence of 68.6% with higher risk among females, older age groups, low educated mothers, non-working mothers, and non-Saudis.

Multinomial multiple logistic regression of dental caries intensity is presented in table 6. Considering caries of primary caries, no significant factors were related to the mild form likelihood. Considering the 0 category (Sound) as reference category, each one-year increase in age is associated by a drop in the likelihood of having 2-3 carious primary teeth rather than sound by about 72%. Males have about 2 times the risk of having 2-3 carious teeth compared to females. The likelihood of having 2-3 carious primary teeth rather than sound is 2.23 among those with rented house compared to those with owned house. There is a likelihood of having 4-5 carious primary teeth rather than sound, each increase in age is associated with drop in the risk of that intensity by 55%. Males had 3.5% the risk of females and those who brush at least once a day. The likelihood of severe primary caries (6+ teeth) rather than sound decreases by 40% for each year increase in age. Males have about 4 times the risk of having severe caries compared to females and each one-point increase in OHI score is associated with increase in risk by about 80%.

As regards permanent teeth caries, the likelihood of having DMFT of 1 rather than sound increases by 34% for each year increase in child's age, and in students whose fathers are less than secondary school education is 2.41 times more compared to higher educated fathers. The likelihood of having 2-3 carious permanent teeth rather than sound increases by each year increase in age by 35% and 2.2 times among males compared to females, with 2.1 times higher risk among less than secondary educated mothers compared to secondary or more educated. Considering the risk of having 4-5 carious permanent teeth, it was increasing by 61% for each year increase in age and by almost 5 times with male's gender. The most severe caries (6+ teeth) was increasing for each year increase by 2.5 times, with male gender by 2.3 times, among children with rented house by 2.6 times, with low educated mothers by 2.6 times and with each one-point increase in OHI score by 1.7 times.

Table 3. Caries prevalence and severity by gender and age

		No. examined	d	m	f	D	M	F
Gender	Overall	563	59.1	2.5	3.4	65.9	4.3	7.6
	Male	262	66.4	3.8	3.1	74.8	3.1	5.3
	Female	301	52.8	1.3	3.7	58.1	5.3	9.6
	P		**0.001***	**0.059**	**0.694**	**< 0.001***	**0.185**	**0.056**
Age (years)	6-	52	86.5	7.7	5.8	25.0	0.0	1.9
	8-	77	79.2	3.9	3.9	40.3	1.3	0.0
	10-	146	77.4	4.1	4.8	61.0	2.7	6.2
	12-13	288	39.6	0.3	2.1	82.6	6.6	11.5
	P		**< 0.001***	**0.004**	**0.340**	**< 0.001***	**0.034***	**0.002***

* P < 0.05 (Significant)

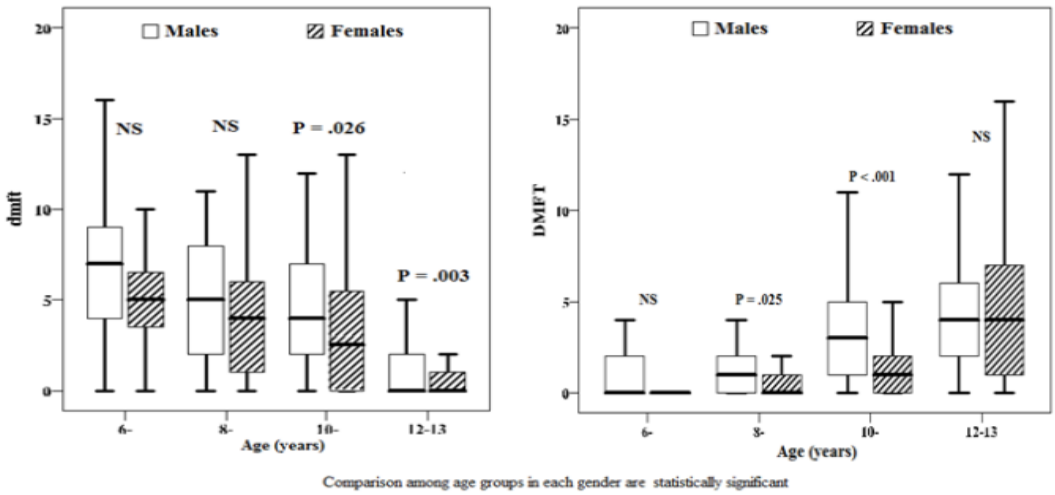

Figure 1. Intensity of dental caries by gender and age

Table 4. Caries prevalence by demographic data of students

Characteristics		No. examined	dmf			DMF		
			Caries %	OR	95% CI	Caries %	OR	95% CI
Overall		563	59.7			68.6		
Gender	Male	262	66.8	1.75*	1.24 - 2.46	76.0	1.93*	1.33 - 2.78
	Female	301	53.5	1.00		62.1	1.00	
Age (Years)	6-	52	86.5	9.53*	4.15 - 21.87	26.9	1.00	
	8-	77	79.2	5.65*	3.11 - 10.29	40.3	1.83	0.85 - 3.93
	10-	146	78.1	5.28*	3.34 - 8.35	65.8	5.21*	2.58 - 10.51
	12-13	288	40.3	1.00		85.1	15.47*	7.73 - 30.93
Father's Education◈	No education	53	52.8	0.66	0.34 - 1.28	77.4	1.66	0.78 - 3.53
	Primary school	63	57.1	0.79	0.42 - 1.48	81.0	2.07	0.99 - 4.34
	Intermediate school	73	42.5	0.44*	0.24 - 0.80	78.1	1.73	0.88 - 3.42
	Secondary school	132	59.1	0.85	0.51 - 1.43	72.0	1.25	0.72 - 2.16
	University or higher	113	62.8	1.00		67.3	1.00	
Mother's education⁂	No education	84	51.2	0.83	0.46 - 1.50	76.2	1.95*	1.02 - 3.74
	Primary school	88	54.5	0.95	0.53 - 1.70	81.8	2.75*	1.39 - 5.43
	Intermediate school	86	52.3	0.87	0.48 - 1.56	81.4	2.67*	1.35 - 5.29
	Secondary school	112	64.3	1.43	0.81 - 2.50	66.1	1.19	0.67 - 2.10
	University or higher	95	55.8	1.00		62.1	1.00	
Fathers' work	Yes	458	59.6	1.00		68.3	1.00	
	No	92	58.7	0.96	0.61 - 1.52	68.5	1.01	0.62 - 1.63
Mothers' work	Yes	113	66.4	1.00		60.2	1.00	
	No	443	57.3	0.681	0.44 - 1.05	70.4	1.58*	1.03 - 1.43
Citizenship	Saudi	526	60.1	1.00		67.3	1.00	
	Non-Saudi	37	54.1	0.78	0.40 - 1.53	86.5	3.11*	1.19 - 8.12
Residence	Owned	430	57.0	1.00		69.5	1.00	
	Rented	116	67.2	1.55*	1.01 - 2.39	68.1	0.94	0.60 - 1.45

◈98 missing father's education and 129 missing mother's education

⁂13 missing father's work and 7 missing mother's work

Table 5. Caries prevalence by oral hygiene status and habits of students

Characteristics		No. examined	dmf			DMF		
			Caries%	OR	95% CI	Caries %	OR	95% CI
Daily tooth brushing	Twice	79	55.7	1.00		65.7	1.00	
	Once	57	53.8	0.93	0.58 - 1.49	75.0	1.57	0.92 - 2.67
	Not frequently	65	68.4	1.72*	1.13 - 2.63	64.4	0.94	0.62 - 1.45
	Never	61	58.3	1.11	0.66 - 1.86	76.2	1.67	0.94 - 2.99
Miswak	Yes	81	57.1	1.00		71.8	0.81	0.54 - 1.21
	No	181	60.7	1.16	0.80 - 1.69	67.3	1.00	
Tooth flossing	Yes	11	54.5	1.00		66.7	1.00	
	No	251	60.0	1.25	0.62 - 2.54	68.7	1.10	0.52 - 2.31
Dental visits	Every 6 months	10	47.1	1.00		76.5	1.00	
	Every 12 months	14	63.2	1.93	0.51 - 7.31	89.5	2.62	0.41 - 16.54
	Irregular	6	54.5	1.35	0.29 - 6.18	90.9	3.08	0.30 - 31.98
	When needed	83	57.4	1.52	0.57 - 4.07	69.8	0.71	0.22 - 2.26
	Never	149	62.3	1.86	0.70 - 4.96	64.8	0.57	0.18 - 1.78
OHI-S (Soft deposit)	<1 (Good)	106	61.4	1.00		66.4	1.00	
	1- (Fair)	114	59.0	0.90	0.60 - 1.36	66.7	1.01	0.66 - 1.54
	2+ (Poor)	42	59.5	0.92	0.55 - 1.53	76.6	1.65	0.94 - 2.90

* P<0.05 (Significant)

Table 6. Multinomial multiple logistic regression of potential predictors of dental caries severity

		P value	OR	95% Confidence Interval for OR	
				Lower Bound	Upper Bound
Caries severity (dmft)					
1	No significant factor				
2-3	Age (years)	.000	.719	.597	.865
	Male	.030	1.896	1.065	3.378
	Residence	.023	2.231	1.117	4.454
4-5	Age (years)	.000	.551	.446	.680
	Male	.002	3.508	1.606	7.663
	Brushing<once a day	.033	2.232	1.065	4.677
6+	Age (years)	.000	.413	.340	.501
	Male	.000	3.811	1.965	7.391
	OHI	.016	1.811	1.117	2.936
Caries severity (DMFT)					
1	Age (years)	.014	1.335	1.060	1.680
	Father education <secondary	.040	2.414	1.040	5.601
2-3	Age (years)	.000	1.351	1.153	1.583
	Male	.019	2.187	1.136	4.214
	Mother education <secondary	.025	2.053	1.095	3.849
4-5	Age (years)	.000	1.811	1.481	2.213
	Male	.000	4.825	2.377	9.795
6+	Age (years)	.000	2.534	1.924	3.338
	Male	.019	2.323	1.148	4.699
	Mother education <secondary	.008	2.560	1.277	5.133
	Rented house	.023	2.601	1.140	5.936
	OHI score	.017	1.866	1.120	3.110

The reference category for dmf/DMF is: 0 Sound
P < 0.05 (Significant)

DISCUSSION

The present study assessed the oral health status and habits and explored potential risk factors for dental caries among 6-13 years old school children who have poor access to oral health care in the Al-Khomrah district, south Jeddah, Saudi Arabia.

Al-Khomrah district was selected for this study as most of the children in this area were studying in government school which is a proxy indicator of their low socioeconomic status. Further children have to depend on their parents to avail health care facilities [5]. Geographic obstacles and availability of transportation are other reasons affecting the utilization of oral health care to this population.

It is clear from the current study as for conduct, brushing the teeth was the usual procedure utilized for cleansing the oral cavity, then Miswak. The dental floss was the least common procedure used. This coincides with other researches [8-10]. This could indicate the absence of understanding and recognition of the method and its merit in stopping dental diseases between people.

In relation to the prevalence of brushing, flossing and use of Miswak in association with gender, it was observed that males brushed and flossed their teeth less than females. The notable difference was referred to more responsibility concerning health care and own hygiene between females [8-11]. Although females used Miswak less than males, the difference was not statistically significant. This might be explained by the cultural belief among Saudi population [9]. The findings indicate that improvement in awareness toward the use of dental floss is required. This is in accordance with several researches [8-11]. Due to the research-based value of utilizing Miswak and importance of the religious and cultural faith among the Saudi community, the correct way of utilizing Miswak as a cleansing method to obtain greatest advantages needs to be emphasized by means of different involvements.

Regarding dental visits, the majority (49.9%) of school children never visited a dentist, followed by those who just went to their dentist when necessary (41.7%); a minority went to the dentist every 6 to 12 months (6.4%). This is in line with many researches [12, 13]. This may be because of the absence of dental health understanding among these school children which led to a smaller number of dental visits. This unfortunate approach regarding

dental visits caused in capability to make use of strong guidance on preventive oral health measures, recommendations and increased frequency of caries, and postponed identification and treatment of decayed teeth [13]. In the present research, the prevalence of visiting the dentist by gender was significantly different. Girls had more frequent visits than boys.

Three hundred twelve children (55.4%) had fair oral hygiene, which is lower than that observed in Nigeria (72%) and Kuwait (67%) [14, 15]. There were notable gender variations in oral hygiene condition, where acceptable conditions were found to be lower in males than in females. It was observed that females are more aware of their own hygiene and perform improved dental hygiene than males due to their better social understanding and cleaning habits [16].

Dental decay was reported to be the most prevalent dental disease among this population. Despite credible research-based progress and the reality that dental caries can be prevented, dental caries remains a major public health problem [5]. Therefore, the assessment of its prevalence has a significant role in enhancing oral health.

It was found that, based on caries prevalence, findings of the present study are similar to previous studies in Saudi Arabia where caries was high (59.7% for primary teeth and 68.6% for permanent teeth) in almost all age groups and increased as age advanced [17, 18]. However, the findings were not similar to the study by Dahr et al. [19] in 2007 between 5-14 years old students of rural districts in Udaipur area and Rao NV et al. [20] in 2012 among 5-12 years old students of rural and urban districts of Guntur, where caries prevalence was low compared to the present study.

Al-Ansari [21], showed that high frequency of decay in Saudi populations was linked to huge increase in people combined with considerable social development, poor dental health habits and performance, poor access to oral health care especially in distant places, absence of fluoridated water and deficiency of scientific and community-based studies.

The decayed component was the main part of the dmft/DMFT scores as evident by increased prevalence of carious primary (59.1%) and permanent teeth (65.9%), which agrees with other previous Saudi studies. Many investigationsof boys and girls in Saudi Arabia have also showedcaries as the mainpart of DMFT [17, 22, 23].This huge amount of untreated decay requires very high restorative services of the examined community and accordingly a great attempt will be needed to provide them with restorative needs.

Dental caries is known to be a lifestyle and behavior related disease that is influenced by various factors such as, gender, socioeconomic status, oral hygiene habits, and dental visits. These elements are of major significance as tools to tailor proper health [24].

Concerning gender, it has been found the prevalence of decayed primary and permanent teeth was significantly higher among Saudi males than females. This may be because females are more caring about their dental health than males, which is in accordance with other researches in Riyadh [25]. Missing and filled primary and permanent teeth were recorded with no significant difference between males and females.

Regarding age groups, younger children, in case of primary teeth and older children, in case of permanent teeth had significantly higher prevalence of dental caries. Similar trends were observed for missing and filled teeth whether primary or permanent. This high prevalence was found to be related with the oral hygiene practices and agrees with results of former investigations in Saudi Arabia [26, 27].

Our study showed that higher risk of dental decay in primary teeth was observed among students, with university educated fathers and those with rented houses. On the other hand, higher caries risk of permanent teeth was seen among students, with low educated fathers and those who owned a house. The high caries prevalence and low social category may be related to abundance of inexpensive sugar containing goods combined with decreased income and deficient access to health facilities and learning [28]. The decreased caries frequency in elite class might be referred to more dental health care knowledge between the high socioeconomic class and approach to oral care by their children at a younger age [29].

Results of this study revealed an important relation between dmft/DMFT scores and the frequency of dental hygiene measures, school children who brushed routinely (once or twice daily) had the lowest percentage of severe caries, in contrast to those who not frequently or not ever brush their teeth, which agrees with the results of Powell et al. [30].

Furthermore, severe tooth decay was frequent among those who went to a dentist routinely (every 1 year) than those who never visited a dentist. This coincides with Xu et al. [31]. The increased dmft/DMFT scores could be referred to the problem driven dental visit manner of the examined subjects. The majority of them went to dentists just when they complain from a dental issue that necessitates management. Researches have also showed that there is a correlation between caries and socioeconomic condition. Also, fatherly earnings,

academic degree, work condition and further socioeconomic elements have a significant effect on the prevalence of dental decay [32].

Multinomial multiple logistic regression indicated that intensity of primary teeth caries decreased with increasing age and brushing teeth at least once a day and increased with male gender, living in rented house or having poor oral hygiene. As regards permanent teeth, the likelihood of having more severe caries increased by child's age, low educated fathers and/or mothers, being a male, and with poor oral hygiene. These findings agree with two other studies showing that students attending public schools were identified as the more vulnerable populations to be affected by dental caries. Also, dental caries continues affecting children from poor socioeconomic profiles [33, 34].

Unmet treatment need was found to be high among children with poor approach to dental care facilities in south Jeddah, Saudi Arabia. Future health education programs should be targeted towards parents and teachers of school children that can significantly influence children's oral health behavior.

CONCLUSION

Dental caries prevalence and intensity were moderate among Al-Khomrah school children. Males had a notably increased caries prevalence and intensity than females. Furthermore, the younger age groups, in case of primary teeth and the older age groups, in case of permanent teeth had significantly higher prevalence and severity of dental caries. More oral health promotion, and community-based activities are needed among the surveyed children.

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Conflict of Interest

There is no conflict of interest between authors.

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