

ORAL HYGIENE HABITS AND ITS ASSOCIATION WITH DENTAL CARIES AMONG CHILDREN AGED 8-12 YEAR IN LIBYAN SCHOOLS, KLANG VALLEY, MALAYSIA

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ABSTRACT

Background: Dental caries is a serious public health problem worldwide. Prevalence of dental caries among school children has increased in both developed and developing countries since the last few decades. The objective of this study was to determine the association of dental caries with oral hygiene habits among Libyan school children aged 8-12 years in Klang Valley, Malaysia.

Methodology: A cross-sectional study was conducted in three Libyan primary schools in Klang Valley, Malaysia. Five hundred and seventy children aged 8-12 years participated. They were randomly selected using proportional stratified sampling method. Dental caries was assessed using the WHO (1987) criteria.

Results: Response rate was 92.5%. The prevalence of dental caries was (55.8%), females have higher dental caries than males. Dental caries was found highly prevalent among; children their aged ≤ 10 years (64.7%), children whose father and mother have a job (58.5% and 58.7%) respectively, children whose father and mother have elementary level of education (69.6% and 61.0%) respectively, children who have poor oral hygiene (99.0%). Chi square test showed significant association of dental caries with age group, father's education level and oral hygiene habits. Logistic regression analysis identified young age (OR=0.085, 95% CI: 0.017-0.434) and poor oral hygiene (OR=0.001, 95% CI: 0.00-0.009) were significant predictors of dental caries among children.

Conclusions: Prevalence of dental caries is associated with oral hygiene habits of children in this study. Health education on good oral hygiene habits should be emphasized among younger Libyan school children.

Keywords: Dental Caries, School Children, Oral Hygiene Habits.

1.0 Introduction

Dental caries or tooth decay is a multi-factorial disease that commonly affects people of all ages throughout their lifetimes which – through interacting with food, dental plaque and microorganisms over a long period of time – leads to an irreversible destruction of the proper substance of the teeth, including dental enamel, dentin and tooth cement (Fejerskov, 2004). Dental caries is a very common and important dental public health problem and it is the most prevalent oral disease among children in the world (Featherstone, 2004). Caries is five times as common as asthma and seven times more common than hay fever thus, the most common chronic disease of childhood. Even in low caries risk populations, dental caries is still a very common childhood disease (Yabao et al., 2005).

Poor oral health is detrimental for children since it affects their nutrition, growth and development. Childhood oral disease, if untreated, leads to pain, development of dento-facial anomalies and other serious health problems, such as severe toothache, dental abscess, destruction of bone, and spread of infection via the bloodstream (USDHHS, 2000). World Health Organization (WHO, 2013) exposed that oral disease obstruct all ages activities and causing millions of school and work-hours to be lost each year all through the world. Dental caries in primary teeth can lead on negative impact of children health in both short and long-terms of their lives (Bader et al., 2004).

In a number of developing countries dental caries prevalence has been affecting 60-90% of schoolchildren (Petersen, 2005). The prevalence of dental caries is of great interest for long and is a major subject of many epidemiological researches carried out in our country and abroad (Tobias, 2008). This disease not only causes damage to the teeth, but is also responsible for several morbid conditions of the oral cavity and other systems of the body (Petersen et al., 2005). The pattern of prevalence dental caries not only varies with age, sex, socio economic status, race, food habits, oral hygiene practices and geographical location but also within the oral cavity (Bader et al., 2004).

Oral hygiene is the practice of keeping the mouth clean and healthy by brushing and flossing, bacteria can live in the mouth in the form of plaque, causing dental caries and gingivitis, which can lead to periodontal (gum) disease. Frequency of brush teeth at least twice a day or more, ideally after meals in the morning and before going to bed also when the first teeth erupts should be supervision from adults up to the age of eight year that primary reasons for the dental caries to decline (Sofrata et al., 2011). Good oral hygiene should start in earlier age than what is generally believed. Oral care during childhood, along with acquiring habits for its maintenance, is what will allow adults to keep their teeth throughout their lifetime. For this reason, instead of waiting for the first teeth to appear, it is wise to begin oral hygiene practice in early age with a piece of cotton gauze moistened with drinking water. Many parents, from lack of awareness, tend to initiate their children's oral hygiene around the age of two years .And it is quite likely that by this age children first dental caries has appeared (Okada et al., 2002).

Development of dental caries during the primary dentition frequently results into dental caries development in the permanent and mixed dentition as well. Those aged 8 to 12 years old are at the mixed dentition stage (Kassawara et al., 2010). Consequently, it is imperative to study this age group in order to develop necessary intervention and education in this area.

2.0 Methodology

2.1 Study design and study population

A cross-sectional study conducted in three Libyan schools in Klang Valley, Malaysia. A total 616 of children were selected as a sample using proportional stratified sampling method.

2.2 Study Instrument

2.2.1 Questionnaire

A self-constructed questionnaire was used, it adopted from different sources like articles and research studies which were done on same study design and the questionnaire was guided self-administrated. It has been prepared in English language then was translated to Arabic language by expert who has experienced in both Arabic and English language.

2.2.2. Oral examination

Oral examination was performed in the classrooms under daylight using dental mirrors, dental explorer and cotton rolls to control salivation during examination. The examination was done by the researcher and a trainer dentist; dental caries was conducted using the World Health Organization (WHO, 1987) diagnostic criteria for oral health survey. The decayed, missing and filled (DMFT) index was not used, as it was not expected to find missing and filled teeth in large numbers among these age groups. In addition, the practical difficulty in assessing other components as the examination was carried out in the classrooms that forced us to limit the assessment process to the presence or absence of cavitations.

2.3 Data analysis

All the data was analyzed by using IBM Statistical Package for Social Science (SPSS) Version 20.0. Descriptive analysis was used to determine the socio-demographic factor, oral hygiene habits, dietary habits and prevalence of dental caries. Among the descriptive analysis were mean, standard deviation and percentiles. Chi-square test and Fisher's exact test were used for categorical data to determine the association between dental caries with socio-demographic factors, oral hygiene habits and dietary habits ($p > 0.05$). To determine the risk factors of dental caries, multivariate binary logistic regression analysis was done. In the final model of logistic regression we included the variables from the first model of logistic regression analysis that had a p -value < 0.25 (Vallejos-Sanchez & Gutierrez, 1998). The results were being expressed as odds ratio (OR) with 95% confidence intervals (95% CI). Significant level of p -value remained < 0.05 for the final model of logistic regression. This study was conducted after receiving ethical approval from Ethics Committee for Research Involving Human Subject, University Putra Malaysia. Approval letter was obtained from the headmasters of schools. Consent letter has been sent to parents to get their consent for their children to be participating in this study, confidentiality was assured to the parents. Students have been given some explanations about the objectives of study.

3.0 Result

3.1 Response rate

All 8-12 years-old schoolchildren of both males' and females' attending three Libyan schools in Klang Valley Malaysia (from grade 3 to grade 7) were invited to participate in this study. Written consents were obtained from 570 out of the 616 subjects. The overall response rate was 92.5%. The main reasons for non-responses rate of 46 children, who did not take part were lack of signed parental consent (n= 34) or absence from schools (n=12).

3.2 Socio-demographic characteristics of students

As shown in Table 1 the study included 570 Libyan school children with age ranged from 8 to 12 years from the third grade to seventh grade. The mean and Standard Deviation (SD) of age among students was 9.91 ± 1.414 years. The age is classified into two groups ≤ 10 years old were 348 students (61.1%) and >10 years old were 222 students (38.9%). There were 272 (47.7%) males and 298 (52.3%) females. majorities of students fathers (83.5%) and mothers (54.2%) had high education level. Forever mothers' had higher percentage of elementary education (36.8%) than fathers (13.9%). Regarding parents job status, high percentage of students' fathers had job (91.1%) while percentage of students' mothers who had job was 59.6%. The prevalence of dental caries among Libyan children was 318 (55.8%)

Table 1: Socio-demographic characteristics of students (N=570)

Variables	Frequency =n	%
Age(9.91 ± 1.414)		
≤10 years	348	61.1
>10 years	222	38.9
Gender		
Male	272	47.7
Female	298	52.3
Fathers Education level		
primary	15	2.6
Elementary	79	13.9
High	476	83.5
Mothers Education level		
Primary	51	8.9
Elementary	210	36.8
High	309	54.2
Fathers job status		
Yes	519	91.1
No	51	8.9
Mothers job status		
Yes	340	59.6
No	230	40.4

As shown in Table 2, more than half of the children (55.8%) had dental caries. Therefore the students who were caries free were 252 (44.2%) of the sample size.

Table 2: Dental caries distribution of respondents (N=570)

Dental caries status	Frequency =n	%
Dental caries present	318	55.8
Dental caries absent	252	44.2
Total	570	100

3.3 Oral hygiene habits

As shows in Table 3, below students who brush their teeth more than twice a day were 66 (11.6%), 308 (54.0 %) of students who brush their teeth once a day and 26 (4.6%) of students who did not brush their teeth at all. Moreover (28.1%) of children were brushing their teeth before going to sleep, and 28.8% were brushing their teeth at the morning when wake up, while 38.6% were brushing their teeth after every meal. Furthermore majority of children (65.1%) who spend less than 3 minutes while the percentage of students who spend three minutes or more on tooth brushing was 30.4%. Tongue cleaning was carried out by majority of students 63.5 % whereas, 36.5% of respondents answered never clean their tongue. Regarding to the frequency of visiting dentist, 114 (20.0 %) of respondents visit the dentist every six months, 101 (17.7%) of them visit once a year and 217 (38.1%) visit the dentist when there was pain on the teeth and 138 (24.2%) had never visited the dental clinic. Also regarding to the tools using for cleaning the teeth 496 (87.0%) of children use toothbrush and toothpaste for cleaning their teeth, Miswak and dental floss used by 3.9% and 3.5% respectively and only 6 students use finger instead to clean their teeth.

As a response from the question about brushing teeth under parental supervision, 397 (69.6%) of children were guided by their parents and to the remaining 173 (30.4%) said that there was no guidance from their parents and they did it by themselves. A total of 87.9% (501) of children claimed to have their own toothbrush while 69 (12.1) did not have personal toothbrush. Additionally, about 40.4% of the participants were used medium type of tooth brush and 40.0% of the sample used soft tooth brush while, 15.1% were used hard tooth brush and only 4.6% of school children did not use tooth brush at all. Among all study participants, 210 (36.8%) change their toothbrush within six months. However, 110 males, 111 females' total (38.8%) of students' change their toothbrush within three months and 24.4% of participants do not change their toothbrush or change it after it wears. Furthermore, regarding rinsing mouth after any meal, there were 354 (62.1%) of students who rinse their mouth after eating while 216 (37.9 %) of children who did not rinse their mouth after any meal.

Table 3 Percentage of respondents according to oral hygiene habits (N=570)

Status of oral hygiene habits	Frequency n=	%
Frequency of tooth brushing		
Never	26	4.6
Once a day	308	54.0
Twice a day	170	29.8
More than twice a day	66	11.6
Time of tooth brushing		
Never	26	4.6
When wakeup	164	28.8
After meal	220	38.6
Before going to sleep	160	28.1
Time spend on tooth brushing		
Never	26	4.6
Less than 3 minutes	371	65.1
3 minutes or more	173	30.4
Brushing Tongue		
No	208	36.5
Yes	362	63.5
Frequency of visit the dentist		
Never	138	24.2
When have pain	217	38.1
Once a year	101	17.7
Every 6 months	114	20.0
Tools using to brush teeth		
Never	26	4.6
Finger	6	1.0
Miswak	22	3.9
Dental Floss	20	3.5
Toothbrush with toothpaste	496	87.0
Brushing teeth under parental supervision		
No	397	69.6
Yes	173	30.4
Having own toothbrush		
No	69	12.1
Yes	501	87.9
Type of toothbrush		
Never	26	4.6
Soft	228	40.0
Hard	86	15.1
Medium	230	40.4
Frequency of changing toothbrush		
Never or wears	139	24.4
6Months	210	36.8
3 Months	221	38.8
Rinse mouth after any meal		
No	216	37.9%
Yes	354	62.1%

3.4 Association between socio-demographic characteristics with dental caries

The Pearson's Chi – Square analysis in Table 4 below shown that, the association between dental caries and socio-demographic characteristics as age, gender, parents' level of education and parents' job status. The descriptive analysis of dental caries by age groups revealed that students who their aged ≤ 10 years old had high percentage of dental caries (64.7%) compared to students who their aged >10 years old (41.9%) and this indicated that the prevalence of dental caries increases with decreasing in age of children. the association between dental caries and age groups was statically significant ($\chi^2 = 28.474, p < 0.001$).

Therefore, in Table 4 below shown that, there was no significant association between gender and dental caries, ($\chi^2 = 0.400, p = 0.555$). The descriptive analysis of dental caries by gender shown that males constitutes 54.4% and females' constitute 57.0% of dental caries; while males were 45.6% and female were 43.0 % of who did not have dental caries.

In Table 4 below revealed that, there was significant association between fathers education and dental caries ($\chi^2 = 7.373, p = .025$). Dental caries by fathers education level shown that primary school level constitutes 60.0%, elementary school level was 69.6%, and high school level constitutes 53.4% of children who have dental caries. There was a significant association between dental caries and fathers education level ($\chi^2 = 7.373, p = 0.025$).

Whereas, there was no significant association between mothers education level and dental caries, ($\chi^2 = 3.671, p = 0.160$). The descriptive analysis of dental caries by mothers' education shown that primary school level constitutes 51.0%, elementary school level was 61.0% and high school level constitutes 53.4% of dental caries.

Table 4 below shown that, respondents who had whom fathers job have more percentage of dental caries (58.8%) than who had not their fathers' job (55.5%) there was no a significant association between dental caries and fathers job status ($\chi^2 = 0.209, p = 0.661$). Thus, the hypothesis was rejected. In addition , the percentage of dental caries among students' who had whom mothers' job (58.7%) more than students' who had not their mothers' job (53.8%). the result shows that ,there was no a significant association between dental caries and mothers job status ($\chi^2 = 1.320, p = 0.265$).

Table 4 Associations of dental caries with socio-demographic characteristics (N=570)

Socio-demographic characteristics	Dental caries		χ^2	df	P value
	Yes=n(%)	No=n(%)			
Age			28.474	1	$<0.001^{*a}$
≤ 10 years	225 (64.7%)	123 (35.3%)			
>10 years	93 (41.9%)	129 (58.1%)			
Gender			0.400	1	0.555 ^a
Male	148 (54.4%)	124 (45.6%)			
Female	170 (57.0%)	128 (43.0%)			
Fathers Education level			7.373	2	0.025*
Primary	9 (60.0%)	6 (40.0%)			
Elementary	55 (69.6%)	24 (30.4%)			
High	254 (53.4%)	222 (46.6%)			

Mothers Education level			3.671	2	0.160
Primary	26(51.0%)	25(49.0%)			
Elementary	128(61.0%)	82(39.0%)			
High	164(53.1%)	145(46.9%)			
Fathers job status			0.209	1	0.661 ^a
Yes	288(58.8%)	231(41.2%)			
No	30(55.5%)	21(44.5%)			
Mothers job status			1.320	1	0.265 ^a
Yes	135(58.7%)	95(41.3%)			
No	183(53.8%)	157(46.2%)			

*Level of significant at P<0.05, (a) Fisher's Exact Test Values

3.5 Association between oral hygiene habits and dental caries

According to the descriptive analysis of dental caries by oral hygiene shown that students who had poor oral hygiene constitutes 99.0% of dental caries compared to those who had good oral hygiene habits (8.1%). There was a significant association between dental caries and oral hygiene habits as in Table 5 ($\chi^2 = 476.004$, $P < 0.001$).

Table 5 Association between oral hygiene habits and dental caries (N=570)

Oral hygiene habits	Dental caries		χ^2	df	P Values
	Yes n(%)	No n(%)			
poor oral hygiene	296(99.0%)	3(0.1%)	476.004	1	<0.001 ^{*a}
Good oral hygiene	22(8.1%)	249 (91.9%)			

*Level of significant at P<0.05, (a) Fisher's Exact Test Values

3.6 Risk factors of dental caries

In multivariate analysis, logistic regression was performed to assess the impact of a number of factors with regards to dental caries. The full model containing all predictors was statistically significant, ($p < 0.01$), indicating that the model was able to distinguish between respondents who having or not having dental caries. As shown in Table 5 below, set P value <0.25.

Table 5 Risk factors of dental caries

Variables	B	S.E.	Wald	df	Sig.	Odd Ratio	95% C.I. for EXP(B)	
							Lower	Upper
Age group								
≤10 years	2.651	0.883	9.019	1	0.003*	0.071	0.013	0.398
>10 years						Ref		
Gender								
Male	-0.303	0.681	0.198	1	0.656	1.354	0.356	5.144
Female						Ref		
Father job status								
No	-1.608	1.434	1.258	1	0.262	4.994	0.301	82.934
Yes						Ref		
Mother job status								
No	-0.239	0.754	0.100	1	0.751	1.270	0.290	5.570
Yes						Ref		

Father education level			1.304	2	0.521			
Primary	-0.700	7.435	0.009	1	0.925	2.014	0.000	63.251
Elementary	1.084	0.959	1.277	1	0.258	0.338	0.052	2.217
high						Ref		
Mother education level			1.350	2	0.509			
Primary	0.355	1.337	0.071	1	0.790	0.701	0.051	9.626
Elementary	0.864	0.931	0.860	1	0.354	2.372	0.382	14.719
high						Ref		
Oral hygiene habits								
Poor	6.965	1.074	42.027	1	0.001*	0.001	0.000	0.008
Good						Ref		

Cox and Snell $R^2 = 0.709$; Nagelkerke $R^2 = 0.950$; Ref= Reference group

*Level of significant at $P < 0.25$

Therefore, the second step Logistic regression was performed based on the first step and set P value at 0.25 to avoid missing a potentially important variables, which could be risk factor on dental caries. The full model containing all predictors was statistically significant $p < 0.05$.

As shown in Table 6 below, oral hygiene habits recording an odds ratio of (OR= 0.001). This indicated that respondents who had poor oral hygiene habits were 0.001 times more likely to have dental caries than those who had good oral hygiene habits. . Followed by Age groups with the odd ratios of (OR=0.085), indicating that respondents who are in the age group of 10 years or less were about 0.085 times more likely to have dental caries compared with those at age group (more than 10 years), controlling for other factors in the model. Therefore, young age and poor oral hygiene were predictors for increasing prevalence of dental caries among Libyan school children in Klang Valley, Malaysia.

Table 6 Predictors of dental caries

Variables	B	S.E.	Wald	df	Sig.	Odd Ratio	95% C.I. for EXP(B)	
							Lower	Upper
Age group								
≤10 years	2.467	0.833	8.777	1	0.003*	0.085	0.017	0.434
>10 years						Ref		
Gender								
Male	0.347	0.668	0.269	1	0.604	1.414	0.382	5.240
Female						Ref		
Oral hygiene habits								
Poor	6.732	1.015	43.995	1	0.000*	0.001	0.000	0.009
Good						Ref		

Cox and Snell $R^2 = 0.708$; Nagelkerke $R^2 = 0.948$; Ref= Reference group; Adjusted for gender.

*Level of significant at $P < 0.05$.

4.0 Discussions

The present study revealed that about 318 (55.8%) out 570 of Libyan school children aged 8-12 years in Libyan schools in Klang Valley were had dental caries whereas 44.2% of respondents did not have dental caries. prevalence of dental caries was similar to the previous studies in Libyan which reported that the prevalence of dental caries among school children aged 10-13 year was 56.9% (Baccush & Nayak, 1991) and 57.8% (Huew, 2010). Comparing

the prevalence of dental caries in this study with previous studies conducted in different countries, the prevalence in present study was lower than that found in Philippines among schoolchildren the prevalence of dental caries was (74.9%) (Yabao et al., 2005), also study conducted by AlDosari et al., (2004) among 12-13 year-old school children in Saudi Arabia the percentages of dental caries were 92.3% and 87.9%, respectively. Similarly it was lower than the study done by Auad et al (2009) among schoolchildren in Brazil the prevalence was 78% and in Saudi Arabia study was done by Amin & Al-Abad (2008) among primary school children the prevalence of dental caries was 68.9% and in Libya by Al Sharbati et al (2000) carried out among 6-12 years old the prevalence was 61.9%. Contrary, the prevalence of dental caries in present study was higher than in, Iran (36.2%) (Momeni et al., 2006), Italy (43.1%) (Campus et al., 2007), Tunisia (48.3%) (Abid, 2004), in the UK (32.7%) (Pitts et al., 2006), India (10%) (Bradley & Wendell, 2009) and Nigeria (35.5%) (Okoye & Ekwueme, 2013).

Based on this study, the prevalence of dental caries was decreased with increasing of age; it decreased from (64.7%) at age 10 years and less reaching (41.9%) at age above 10 years. This result was consistent with other studies were done by Elfaki et al., (2014) found that the prevalence of dental caries was (20.31%) higher among 10-11 years than (13.02%) among 12-13 years. Furthermore study conducted in India which was found dental caries decrease with increase age (Sohi et al., 2012). This reason suggested behind the decreased prevalence of dental caries with increased age group is due to increase in level of manual dexterity of the children, improving the oral hygiene also increased awareness about oral health (Grewal et al., 2009). Unlike other studies of Sahito et al., (2015) found that the prevalence of dental caries was 60% in age group 8-10 years and 80% in age group 11-12 years and similar with study was done by Baccush & Nayak (1991) among Libyan school children aged 10-13 years the percentages of dental caries were (53.7%, 55.7%, 56.7%, 66.6%) respectively for ages (10, 11, 12, 13). Bivariate analysis in this study showed that there was a significant association between age group and dental caries ($\chi^2 = 28.474$, $p < 0.001$).

According to the results of this study, the prevalence of dental caries was higher among females than males (57.0% and 54.4%) respectively. This is similar to the results reported by other studies, females' having been found a higher percentages of dental caries than males (Kiwanuka et al., 2006; Auad et al., 2009 and Huew, 2010). This result could be explained by the commonly fact there is a trend towards earlier eruption of permanent teeth in females than males and they are exposed to risk factors for dental caries for a longer period of time than in males. However, study in India found no difference between males and females in a study of 12 year-olds (Bradley & Wendell, 2009). In contrast, males' were found to have a higher prevalence of dental caries than females in Libya (Al-Sharbati et al., 2000), and Tunisia (Abid, 2004), nevertheless these gender differences were not statistically significant. In the present study, although the prevalence of dental caries was higher in females as compared with males; there was no significant association between gender and dental caries ($\chi^2 = 0.400$, $p = 0.555$). The variety of children could be explain this difference between the present study with others which found there was a significant association between gender and dental caries.

In the present study, the percentage of dental caries increased with the increasing of mothers educational level up to elementary school level, then decreased at higher level. In this study, there was a significant association between dental caries and fathers level of education ($P=0.025$) whereas, there was not significant association between dental caries and mothers level of education ($P=0.160$). The percentages of subjects with dental caries were increased

with increasing of fathers and mothers level of education at elementary school level, afterwards decreased at high level of education. The reason for this could be explained by the fact, parents with a high level of education observe and control the dietary habits of their children although the fact that wealthy families who parents' had high level of education might afford costly sugar products. This results agreement with previous study was done in Libya by Baccush & Nayak(1991) among Libyan school children, children whose mothers had a high level of education had a lower dental caries than those children with mothers of low level of education . In addition similar study was done by Hashim et al (2006) found that children of mothers with low levels of education had high dental caries than children of mothers with high level of education. Study by Walker et al. (2000) reported that parents' with high level of education associated to improved oral health. The reason for this result could be explained by that parents' with a high level of education detect and organize the dietary habits of their children even though the fact that rich families who parents' had high level of education could afford pricey sugar produces. This result recommends influence parents' level of education on dental health of their children.

The present study showed that there was not significant association between dental caries and parents job status ($P = 0.661$) and ($P = 0.265$) for fathers and mothers respectively. Children whose mothers and fathers had a job had higher rate of dental caries than children whose parents did not have a job. This result could be explained by the fact that parents who had a job spending more time away from home and their children which might be influencing the increased frequency of consumption sugary food and soft drinks (Mangueira et al., 2009). Mostly people who have a job they get money and socio economic status increased this finding is similar to the trend observed in other developing countries where dental caries prevalence was observed to increased with increasing socio-economic status (Addo et al .,1991; Normak ,1993; Cleaton et al .,1994). This also might be explained by the fact that wealthy families who parents had a job might afford costly sugar products.

The current study found that there was significant association between dental caries and oral hygiene habits, ($p < 0.001$) .Children who had poor oral hygiene have higher dental caries than who had good oral hygiene. This findings agreement with study conducted in Libya by Baccush & Nayak (1991) reported that children with poor oral hygiene had a significantly higher dental caries than children with good oral hygiene. Similar study estimated by Jamieson et al. (2004) reported that children who brush their teeth infrequently had higher percentage of dental caries than children who brush their teeth more frequently. Okoye & Ekwueme (2013) also found that there was significant association between dental caries and oral hygiene habits ($P < 0.001$) children who used fluoridated toothpaste and visited the dental clinic have less dental caries than those who did not. On the other hand the results of the present study are disagreement with other studies reported that no statistically significant associate between frequency of tooth brushing and dental caries (Huew, 2010; Sudha et al., 2005; Yabao et al., 2005; Shetty & Tandon, 1988). This could explain why frequent tooth brushing did not decrease the chance of being in the caries free group in these studies, it is possible some children who had better access to care were in dental caries as a result of over treatment of dental caries. These children might receive a preventive effect of frequent tooth brushing (Chankanka , 2010).

5.0 Conclusion and recommendation

In conclusion, prevalence of dental caries among Libyan school children is high. Poor oral hygiene habits among younger children are associated with and were identified as modifiable risk factors of dental caries among Libyan school children at age 8-12 years in Malaysia. These modifiable risk factors will be appropriate goal for future intervention.

There is an argent need to address to dental caries in health promotion and health education strategies to spread awareness about dental caries and its consequence among school children and their parents. Moreover, Parents should supervise child when brushing their teeth and encourage students to control of risky behaviors', such as intake of sugary foods and drinks and help child develop good eating habits Health education messages targeting the school children to raise their awareness regarding dental knowledge and sound oral hygiene habits should be planned and implemented. In addition, sufficient training of dentists and dental professionals should be carried out to allow them to recognize the early stages of dental caries in order to prevent further progression of this condition and reduce the cost of treatment.

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Declaration

Authors declare that the article has not been published or submitted for publication in any other journal.

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