

Prevalence of Oral Habits and its Effect in Primary Dentition among Sudanese Preschool Children in Khartoum City

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Abstract

Aim: To determine the prevalence of oral habits and its association with certain parameters (age, gender, child rank in the family, mother education and feeding type and duration) and the effect of oral habits on the occlusion of primary dentition. **Methods:** A cross-sectional study through questionnaire and clinical examination for 489 preschool Sudanese children 3-5 years old, from randomly selected kindergartens in Khartoum. **Results:** Prevalence of oral habits was found to be 30.3%. Thumb sucking was the most prevalent one. No significant associations were found between oral habits, age and gender. A significant association were found between oral habits and rank of the child in the family as well with mother education level and breast feeding ($P < 0.05$). A higher prevalence of open bite, increased overjet, distal molar relation, Class II canine relation, and posterior cross bite were found among children with existing oral habits. **Conclusion:** Sudanese preschoolers had high prevalence of oral habits and persistent of oral habits after the age of three years has side effect on the primary occlusion, so early recognition of oral habits and proper education program for parents and children are recommended to prevent and intercept the occurrence of malocclusion in the permanent dentition.

Keyword: Oral Habits; Thumb Sucking; Nail Biting; Breast Feeding.

Introduction

Oral habits are learned pattern of muscle contraction and have a complex nature. It is classified as physiological such as nasal breathing, chewing, phono-articulation and swallowing, and non-physiological habits which are often called harmful or parafunctional such as thumb or lip sucking, mouth breathing and tongue thrust [1, 2].

An oral habit in infancy and early childhood is normal and it is considered abnormal over 3 years old. The persist of the oral habits have little effect on child health but can affect the facial growth [3].

Oral habits play significant role in altering the position of the teeth, the inter-arch relationship, interfering with the normal growth of the jaws and the function of the orofacial musculature [3, 4].

Oral habits are one of the major etiologic factors of malocclusion and disturbance of the dentofacial structures [5]. A strong correlation exist between oral habits and development of malocclusion in the primary dentition; 40% of causes of malocclusion were related to oral habits such as anterior open bite, increased overjet, decreased maxillary arch width, posterior cross bite, and Class II canine and molar relationships [6, 7].

Early recognition of the present of oral habits and proper planning to stop them is so important to avoid harmful effect on the developing occlusion. The American Academy of Pediatric Dentistry (AAPD) states a policy to encourage the treatment of oral habits so as to prevent and intercept the occurrence of malocclusions and skeletal dysplasia [8].

Wide range of oral habits prevalence has been reported among children in different countries [9,11] and it is believed to be influenced by varies factors such as gender, rank of the child in the family, feeding methods, socioeconomic status, maternal age, maternal occupation/ education in addition to races and environmental factors [10].

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The present study has been designed to determine the prevalence of oral habits and its association with certain parameter (age, gender, child rank in the family, mother education and feeding type and duration) as well as their effect on the occlusion of primary dentition in a sample of preschool Sudanese children.

Materials and Methods

The study sample consisted of 489 preschool children, randomly selected from 23 preschools in Khartoum city using multistage clustering technique.

Prior to carry out the study permission was obtained from University of Khartoum Research committee, preschool education section ministry of education and the relevant preschools authorities. Questionnaires and informed parental consent were sent through head master of the preschools to the parents of the selected children and recollected after one week interval.

Children whose parents filled and retain the questionnaire and fulfilled the inclusion criteria; medically fit Sudanese children aged 3-5 years old all deciduous teeth should be present with no erupted permanent teeth and no extensive caries lesion or previous orthodontic treatments were included in this study.

The following information about the oral habits and parents was obtained through the questionnaire. Gender, age, child's rank in the family, and mother's educational status were recorded. In addition to the history and duration of breast /bottle feeding of the child and the health status. Questions about the child's past or present oral habits, digit or dummy sucking, nail biting, tongue thrust and mouth

breathing). The oral examination was performed by the main investigator while the child seated in an up-right position in front of the examiner in the teacher office with adequate daylight and the occlusion was assessed while the child was biting in maximal intercuspation, using a sterile mouth mirror, disposable gloves and masks in compliance with the international standards of infection control protocol. The following parameters were recorded [10].

1. Terminal plane relationship of the primary second molars recorded as flush, mesial or distal on each side.
2. Primary canine relationship recorded as class I, II or III on each side.
3. Overbite was recorded as normal (less than or equals to 50%, greater than 50% vertical overlap and edge to edge relationship) or anterior open bite.
4. Over jet more than 4mm was recorded as increased.
5. Presence or absence of posterior cross bites; unilateral or bilateral.

Statistical Analysis

Data was analyzed using statistical package of social science version 18.0. Chi-square test was applied for the associations between non-nutritive sucking habits, gender, child age, and mother education, duration of feeding and rank of child in the family. P-value <0.05 for all statistical tests was considered significant.

Table 1: Distribution of the study sample according to gender and age.

Age (years)	Boys		Girls		Total	
	N	%	N	%	N	%
3	71	27.5	68	29.1	138	28.3
4	122	47.3	100	43.5	222	45.5
5	65	25.2	63	27.4	129	26.2
Total	258	52.8	231	47.2	489	100

Result

A total of 489 preschool children were examined. The majority of the children (45.5%) are 4 years old table (1).

Table (2) showed that the prevalence of oral habits among 489 children was (30.3%). Thumb

sucking habit was the most frequent (11.5%). Whereas, pacifier sucking and tongue thrust were the least occurrence. Thumb sucking and nail biting was more frequent among girls, while mouth breathing more frequent among boys. However, no statistical significant different was observed among gender (P- 0.162).

Table 2: Distribution Oral habits among the children (%)

Type of oral habit	Boy (N=258)	Girls (N=231)	Total (N=489)	Chi square	P-value
Thumb sucking	20(7.8%)	36(15.7%)	56(11.5%)	1.952	0.126
Pacifier sucking	8(3.1%)	4(1.7%)	12(2.5%)		
Nail biting	14(5.4%)	20(8.6%)	34(7.0%)		
Tongue thrust	7(2.7%)	6(2.6%)	13(2.7%)		
Mouth breathing	22(8.5%)	11(4.8%)	33(6.7%)		
Total	71(27.5%)	77(33.3%)	148(30.3%)		

Table 3: The distribution of oral habit at age groups (%)

Type of oral habit	3 year (N=138)	4years (N=222)	5 years (N=129)	Chi square	P-value
Thumb sucking	9(13.8%)	14(6.3%)	23(17.8%)	3.118	0.21
Pacifier sucking	5(3.6%)	4(1.8%)	3(2.3%)		
Nail biting	5(3.6%)	18(8.1%)	11(8.5%)		
Tongue thrust	2(1.4%)	9(4.1%)	2(1.6%)		
Mouth breathing	5(3.6%)	21(9.5%)	7(5.4%)		
Total	36(26.1%)	66(29.7%)	46(35.9%)		

Table (3) showed that the incidence of thumb sucking habits increased slightly in the elder age group, whereas mouth breathing and tongue thrust and pacifier sucking habits increased in the middle age group. However, no statistically significant difference was observed in relation to oral habit and age (P- 0.21).

The results in table 1 and 2 showed no statistic difference therefore, all the three age group were combined as one group for further statistical evaluations.

Low prevalence of oral habits was noted among children with breast-feeding duration longer than one year (P-0.002). No statistical significant

Table 4: Associated between different variables and oral habits among the study sample.

Variables	No of children with oral habits	Chi square	P-value	
Breast feeding duration	0 -5 month	15(57.7%)	12.725	0.002
	6- 11 month	25(38.5%)		
	>12 month	107(27.4%)		
Bottle feeding duration	0-5 month	16(53.3%)	2.379	0.304
	6-11 month	14(35.0%)		
	>12 month	41(41.8%)		
Mother education	Illiterate	1(9.1%)	10.052	0.018
	Primary	5(20.0%)		
	Secondary	8(22.6%)		
	University	114(34.7%)		
Rank of the child	First	60(35.1%)	9.623	0.022
	Second	49(33.6%)		
	Third	22(28.6%)		
	Forth +	17(17.9%)		

Table 5: Occlusion characteristics feature of children with existing oral habits.

Occlusion characteristics	Thumb sucking N=56	Pacifier sucking N=12	Nail bite N=34	Tongue thrust N=13	Mouth breathing N=33	Total N=149
Distal molar relation	21(37.5%)	2(16.7%)	3(8.8%)	2(15.4%)	6(18.2%)	34(23.0%)
Class II canine relation	24(42.9%)	2(16.7%)	5(14.7%)	2(15.4%)	1(3.0%)	34(23.0%)
Increased over jet	39(69.6%)	1(8.3%)	0(0.0%)	1(7.7%)	2(6.1%)	43(29.1%)
posterior cross bite	1(1.8%)	5(41.7%)	0(0.0%)	0 (0.0%)	10(30.3%)	16(10.9%)
Anterior open bite	34(64.2%)	1(8,3%)	0(0.0%)	11(84.6%)	2(6.1%)	38(25.7%)

association between oral habits and bottle feeding ($p=0.304$) was found. Whereas, a statistical significant difference was observed between mother education (university level) and oral habits ($p=0.018$). Moreover, a significant association between the first child in the family oral habits was observed ($p=0.022$) table (4).

Anterior open bite and increased overjet were the most prevalent types of malocclusion, whereas, posterior cross bite was the least frequent type of malocclusion among children with oral habits table(5).

Discussion

This is the first study carried in Sudan and the outcome results showed a high prevalence of malocclusions in a pediatric population under the age of 5 years and a positive association with deleterious oral habits. In addition it imitates the consequence of breast feeding for appropriate time as a defending issue of beginning oral habits. It was a cross sectional study through a questionnaire and clinical examination for Sudanese preschool children 3 - 5 years old in Khartoum city; it aimed to determine the prevalence of oral habits and its association with certain parameters (age, gender, child rank in the family, mother education in addition to feeding type and duration). Moreover effect of oral habits on the occlusion of primary dentition had been recorded.

The prevalence of oral habit in this study was found (30.3%) which is consistent with previous studies [10,12]. and lower than the result reported by Pruneda et al and Santos SA et al among Mexican and Brazilian preschool children respectively [13,14]. Moreover Onyesao et al reported very low prevalence of oral habits (9.9%) among Nigerian children [11]. This wide range of the prevalence's of oral habits may be partially accounted to the fact that different oral habits were surveyed at different age group, different study methodologies had been used (interviews vs. questionnaires) as well as the cultural and environmental factors which may play significant role in the occurrence of oral habits.

In the current study the overall prevalence of oral habits was more frequent among girls although it is not statistically significant ($P=0.126$). The same findings had been reported by Al Hussyeen et al and Shetty et al [10,15] In contrast Santos et al reported significant difference between gender [14]. These controversial results can be better explained if the psychological and cultural differences between boys

and girls at different age groups among different population evaluated.

Oral habits in the present study were observed slightly higher in the older age group. However, it was not statistically significant and it is in line with the findings by AL Hussyeen et al [10]. These findings explained by the fact that most of the oral habits started at the first year and continue at constant level until 7 years of age [16].

On the other hand Franco Varas et al and Santos et al reported that oral habits were more frequent among younger age group (2-3 years) among Spanish and Brazilian children with statistically significant difference [14,17]. In contrast Pruneda et al found oral habits more frequent among older age group (4-5 years) with significant differences between age groups [13]. These variations in the findings can be attributed to the difference in the study age group and type of the habit among the children as mentioned, some habits like thumb sucking and pacifier use are more common among younger age group [18] whereas, other habits like nail biting are common among elder age group [19].

In the present study, thumb sucking habit was the most frequent (11.5%) and dominant in elder age group. Similar finding was reported by Onyesao et al. [11] These findings can be explained by psychoanalytic theory "as children grow older, they tend to abandon self-erotic habits previously associated with pleasure zones, such as those related to the mouth during the oral phase" [20]. In contrast Franco Varas et al reported that thumb sucking habit was the most frequent habit among younger age group [17]. Whereas, Pruneda et al found that thumb sucking habit was the second occurring habit after nail biting among Mexican children [13]. Al Hussyeen et al and Santos et al reported that thumb sucking less common than pacifier sucking among Saudi children and Brazilian children [10,14]. Moreover Lagan et al reported that thumb sucking was the second least occurring oral habit among Albanese children [21].

The second occurring oral habit among the preschool Sudanese's children was nail biting (7.0%), and it was observed more frequently in elder age group. Similar finding had been reported by Almonenantiene et al [22] among 4 to 9 years Lithuanian children, this is partially related to the fact that nail biting commonly occurs in elder age group [19]. Higher prevalence of nail biting (33.8%), (35.0%) were reported by Franco Varas et al and Pruneda et al among preschool Spanish and Mexican children [13,17]. Whereas Shetty et al reported very low prevalence of nail biting among Indian children [15].

Mouth breathing habit was observed in (6.7%) of the study sample and it was more frequent in boys than girls in the middle age group. Pruneda et al reported that mouth breathing was the second most common habit (9.5%) among Mexican preschool children and boys being more predominant [13]. Similar finding was reported by Shetty et al and Lagana et al among Indian and Albanese school children with slight higher prevalence (13.0%) and (23.2%) respectively [15,21]. Much higher prevalence (55%) was reported by Abreu et al among 3-9 Brazilian children [23]. This prevalence's variation can be justified by the diagnostic aids used to confirm mouth breathing.

The prevalence of tongue thrust in this study was (2.7%). It found more frequent in middle age group and no gender differences were noted. Different prevalence had been reported in the literature. Pruned et al and Franco Varas et al reported low prevalence (6.2%) and (8.6%) among Mexican and Spanish preschool children respectively [13,17]. On the other hand Shetty et al and Lagna et al reported higher prevalence's (17.4) and (16.2%) among Indian and Albanese school children [15,21]. The different in the prevalence of tongue thrust may be attributed to the difference in the definition of tongue-thrust as well as the study age group.

Pacifier sucking was the least occurrence habit in this study (2.5%). In contrast a high prevalence (26.2%) and (27.7%) were reported among 3-5 years Saudi and Brazilian children respectively [10,14]. much high prevalence of pacifier sucking (80.0%) was reported by Franco Varas et al among Spanish children [17]. However, low prevalence in the present study may be account for the fact that the use of pacifier is not a common practice among Sudanese mothers unlike other countries in which higher frequency of pacifier use was observed as a result of a modern life style and the attention to reduce the breastfeeding duration [11].

In this study first child in the family was noted more liable to develop oral habits which in consistence with the result obtained by Rajchanovska and Ivanovska and Warren et al. [12,24] Although Faris et al and Al Doowdey did not observed relation in their studies [9,25].

High education level of the mother was found to be significantly associated with existence of oral habits among children in this study which in agreement with studies among Saudis and Pakistani children [9,10].

Breastfeeding plays an important role as a protective factor against occurrence of oral habits because it enhances the development and

strengthening of muscles and bone structure, contributes to the child emotional maturity and satisfy the oral phase [26]. In this study strong correlation was noted between the duration of breast feeding and occurrence of oral habits. Similar result had been reported in previous literature among different population [10,25,27,28].

In the current study the most common malocclusion associated with oral habits was anterior open bite and increased over jet. Same finding had been observed among other population [11,17,28].

Conclusion

1. High prevalence of oral habits was found among the Sudanese preschool children and thumb sucking was the most frequent habit. No significant association was found between gender, age and the occurrence of oral habits.
2. A strong association was reported in relation to child rank in the family, mother education level and the exited oral habits. Long duration of breast feeding associated with less incidence of oral habits.
3. High percentage of anterior open bite and increase overjet were found among the children with existing oral habits.
4. The Pedodontics should detect the habits as early as possible in the child so that he/she can prevent and intercept the dental problems as soon as possible to get the better results. And Proper Corporation should be achieving between the doctor, parent and the child so as to get the perfect smile for the youngster.

Recommendation

- The results of this study reveal the need of attainment of instant educative-preventive programs by the community administrator and local government health authorities, in order to permit an effective and appropriate care to these children and avoid the frustration of occlusal alterations at elder age.
- The Pedodontics should detect the habits as early as possible in the child so that he/she can prevent and intercept the dental problems as soon as possible to get the better results. And Proper cooperation should be achieved between the doctor, parent and the child so as to get the perfect smile for the youngster.

References

1. Shahraki n, Yassaei S. Abnormal oral habits:A review. *JDOH*. 2012; 4: 12-5.
2. Agurto PV, Diaz RM, Cadiz OD, Bobenrieth FK. Oral bad habits frequency and its association with dentomaxilar abnormal development, in children three to six year old in Santiago Oriente. *Rev Chil Pediatr*. 1999; 70: 470-82.
3. Josell SD. Habits affecting dental and maxillofacial growth and development. *Dent Clin North Am*. 1995; 39.
4. Bear PN, Lestor M. The thumb,the pacifier,the erupting tooth and a beautiful smile. *J Pedodontics*. 1987; 11: 115-9.
5. Shetty SR, Munshi AK. Oral habits in children—a prevalence study. *Journal of the Indian Society of Pedodontics and Preventive Dentistry*. 1998.; 16: 61-6.
6. Warren JJ, Bishara SE, Steinbock KL, Yonezu T, Nowak AJ. Effects of oral habits' duration on dental characteristics in the primary dentition. *J Am Dent Assoc*. 2001; 132: 1685-93.
7. Calisti LJP. Correlation between malocclusion, oral habits and socio-economic level on preschool children. *JDen Resh*. 1960;39:450-54.
8. Dentistry AAoP. Policy on oral habits. *Pediatric dentistry*. 2005; 27: 40-1.
9. Farsi NM, Salama FS. Sucking habits in Saudi children: prevalence, contributing factors and effects on the primary dentition. *Pediatric dentistry*. 1997 Jan-Feb; 19(1): 28-33.
10. Al-Hussyeen A, Baidas L. Prevalence of non-nutritive sucking habits among saudi children and its effect on primary dentition. *Pakistan Oral & Dental Journal* 2009; 29.
11. Onyeaso CO. Oral habits among 7-10 year-old school children in Ibadan, Nigeria. *East African medical journal*. 2004 Jan;81(1):16-21.
12. Rajchanovska D, Zafirova-Ivanovska B. Oral habits among pre-elementary children in Bitola. *Biol Med Sci*. 2012:157-69.
13. Pruneda JFM, Bello RIM. Prevalence of non-nutritive buccal habits in a group of preschool children in Nezahualcoyotl City, Mexico (2009). *Bol Med Hosp Infant Mex*. 2011; 68: 24-30.
14. Santos SA, Ana Larissa F. Nonnutritive sucking habits among preschool-aged children. *Jornal de Pediatria*. 2009; 85.
15. Shetty RM, Shetty M, Shetty NS. Oral habits in children of Rajnandgaon, Chhattisgarh, India-A prevalence study. *International Journal of Public Health Dentistry*. 2013; 4: 1-7.
16. Bishara SE, Warren JJ, Broffitt B, Levy SM. Changes in the prevalence of non-nutritive sucking patterns in the first 8 years of life. . *Am J Orthod Dentofacial Orthop*. 2006; 130: 31-6.
17. Franco Varas V, Gorritxo Gi IB, García Izquierdo F. Prevalence of childhood oral habits and their influence in primary dentition. *Rev Pediatr Aten Primaria*. 2012; 14: 13-20.
18. Klackenberg G. Thumbsucking: frequency and etiology. *Pediatrics*. 1949; 4: 418-23.
19. Massler M, Malone AJ. Nailbiting. A review. *J Pediatr* 1950; 36:523-31.
20. Freud S. Oral habits. Madrid 1973.
21. Lagana G, Masucci C, Fiba F. Prevalence of malocclusion,oral habits and orthodontic treatment need in a 7-to 15-years-old school children population in Tirana *Progress in Orthodontis*. 2013; 14.
22. Almonaitiene R, Balcunuene I, Tutkuviene J. Prevalence of oral habits and thier impact on facial parameters in Lithuanian children 4 to 9 years of age. *Medicinos te orija ir praktika*. 2013; 9: 31-8.
23. Abreu RR, Rocha RL. Prevalence of mouth breathing among children. *J Pediatr (Rio J)*. 2008; 84: 467-70.
25. Warren JJ, Levey SM, Nowak AJ. Non-nutritive sucking behaviors in preschool children: A longitudinal study. *Am Acad Ped Dent* 2000; 22: 187-91.
26. Al-Dawoody A. Finger sucking habit:prevalence, contributing factors and effect on occlusion. *A-Rafidain Dent J*. 2004; 4: 135-42.
27. Levy DM. Thumb or fingersucking from the psychiatric angle. *Angle Orthodontist*. 1937; 7: 100-3.
28. Farsi NM, Salama FS. Sucking habits in Saudi children:prevalence, contributing factors and effect on the primary dentition. *Pediatric dentistry*. 1997; 19: 28-33.
29. Ozawa N, Hamada S. A study on the non - nutritive sucking habits in Japanese children *pediatric dental journal*. 2005; 15: 64-71.
30. Onyeaso CO. Oral habits among 7-10 years-old school children n Ibadan, Nigeria. *East African medical journal*. 2004; 81: 16-21.