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Original Research

Oral Habits in School Going Children of Pune: A Prevalence Study

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Abstract:

Background: Oral habit beyond pre-school age is an important etiological factor in developing malocclusion. The aim was to study the prevalence of the oral habits in the school going children of Pune region of Maharashtra.

Materials and Methods: A total of 3663 children were selected randomly from the private and municipal schools between the age range of 5 and 13 years. The questionnaire was given to the parents and consent was obtained. The children were examined in the schools and the presence or absence of the thumb sucking; tongue thrusting and mouth breathing habit were recorded. Statistical analysis was done using Chi-square test and Fisher's exact test.

Results: Out of total study population, 16.8% showed the presence of at least one of the oral habits. The habits were significantly higher in municipal schools. Boys showed a higher prevalence of oral habits. Depending upon the age, Group I showed the highest prevalence.

Conclusion: From the study, it can be concluded that there is a need to intensify oral health education targeting both parents and school children to enable them to get benefit from interceptive orthodontic care.

Key Words: Mouth breathing, oral habits, thumb sucking, tongue thrusting

Introduction

The survival of newborn depends upon instinctive oral sucking. It also nourishes and builds the child's initial psychological and interpersonal function.[1] Oral habit of sufficient frequency, duration, and intensity beyond pre-school age can be an important etiological factor in development of malocclusion leading to socially handicapped child.[2-4] The relative prevalence of oral habit in school going children in India has been reported to be as low as 3% in North India[5] and 30% in South India.[6] However, no data are available regarding the prevalence of oral habit in school going children in Pune region of Maharashtra. Hence, the present study was conducted with an aim to find out the prevalence of different oral habits in children of the private and municipal school of Pune between the age group of 5 and 13 years. The study will provide important documentation in deciding prevalence of oral habit, malocclusion, and orthodontic treatment needed to help formulate strategies of early prevention and correction of malocclusion.

Materials and Methods

The study was conducted by the Department of Pedodontics and Preventive Dentistry, MA Rangoonwala College, Pune, Maharashtra. The study was approved by local Institutional Ethical Committee.

Method of sample collection

A total of 3663 subjects in the age group between 5 and 13 years were randomly selected by stratified sampling method from municipal and private schools. The complete sample was further sub-divided according to the type of school, age, and sex.

I. Sample distribution according to age:
   1. Group 1: 5-7 years: 1959 children
   2. Group 2: 8-10 years: 1410 children
   3. Group 3: 11-13 years: 294 children.

II. Sample distribution according to type of school:
   1. Municipal school: *n* = 2150 (58.69%) (Group 1: 49.6%, Group 2: 41.7%, Group 3: 8.7%)
   2. Private school: *n* = 1513 (41.4%) (Group 1: 58.2%, Group 2: 34.6%, Group 3: 7.2%).

III. Sample distribution according to sex of children:
   1. Boys: *n* = 2341 (63.9%) (Group 1: 54.1%, Group 2: 36.4%, Group 3: 9.5%)
   2. Girls: *n* = 1322 (39.09%) (Group 1: 52.4%, Group 2: 42.1%, Group 3: 5.4%).

Inclusion criteria

1. Completed questionnaire by parent regarding the child's oral habit
2. Children with valid consent forms signed by the parents.

Exclusion criteria

1. Refusal of the consent
2. Current or previous use of orthodontic appliances.

Method

The study was conducted by arranging routine dental checkup camps in school. Permission was taken from Education Department of Pune Municipal Corporation for municipal schools and from respective principals for private schools.

Questionnaire

It included the information regarding child's personal data and history of any previous existing oral habits.

Oral examination

It was carried out in the classroom under natural light, and the findings were recorded in college case history recording proforma under WHO Oral Assessment Guidelines.[7]

Tongue thrusting

During command as well as conscious swallowing, the contraction of lips, tongue movements, and facial muscles were observed to examine for presence or absence of abnormal tongue thrust.

Thumb sucking

A history was taken from parents regarding presence or absence of thumb sucking. In the extra-oral examination, digits were evaluated for redness, cleanliness, short finger nail, and fibrous callus. In intra-oral examination, proclined upper anteriors, narrow arched palate, and posterior crossbite were observed.[8,9]

Mouth breathing

A history was elicited from parents regarding the frequent occurrence of allergic rhinitis and tonsillitis. Jwemen's Butterfly Test and Masseller's water holding test were performed to determine the presence of habit.[10]

Malocclusion was recorded according to Angle's Classification System. Class I malocclusion was further divided into Dewey's Type I, II, III, IV, V. Class I Type II was considered as a separate group to correlate it with oral habits.

All the readings were statistically analyzed by using Chi-square and Fisher's exact test to compare the prevalence of oral habits and malocclusion, the $P = 0.005$ was regarded as significant.

Results

The observation and the result of the study were as follows:

Out of total study population, 16.8% showed one of the mentioned oral habits with 95% confidence interval of 15.67-18.09 (Table 1). Depending upon the type of school, the prevalence of oral habit was significantly higher in municipal schools (19.3%) as compared to private schools (13.9%); $P < 0.001$ (Table 2). According to the sex of the child, boys showed a higher prevalence of oral habits of 18.5%, which was statistically significant (Table 3). Depending upon age, Group I showed the highest prevalence of oral habit followed by Group II and Group III (Table 4).

Individual oral habits

I. Prevalence in total study population

Tongue thrusting showed the highest prevalence of 58.8% followed by thumb sucking, which was 31.9%. The prevalence of mouth breathing and other habits (lip biting, lip sucking, and palm biting) was around 6.3% and 2.9%, respectively (Graph 1).

II. Prevalence of oral habits depending upon type of school

The prevalence of tongue thrusting was higher in municipal schools (11.44%) as compared to private schools (8.19%). Thumb sucking was more prevalent in private school (6%) as compared to municipal school (4.88%), and the difference was statistically significant (Graph 2).

III. Prevalence of oral habit depending upon sex

Tongue thrusting was significantly higher in boys (42.1%) as compared to girls (17.2%). Thumb sucking was 20.3% in boys and 9.1% in girls; the difference was

Table 1: Distribution of study population with and without oral habits.

Habits	Total number	%	95% CI
With habits	617	16.8	15.67-18.09
Without habits	3046	83.2	81.91-84.33
Total	3663	100.0	-

CI: Confidence interval

Table 2: Distribution of oral habits depending upon the type of schools.

Habits	*N* (%)	
	Municipal school	Private school
With habits	390 (19.3)	227 (13.9)
Without habits	1635 (80.7)	1411 (86.1)
Total	2025 (100.0)	1638 (100.0)
Inference	χ^2=18.900; P<0.001**	

**: Chi – Square Test, $P < 0.001$

Table 3: Distribution of oral habits according to sex.

Habits	*N* (%)	
	Boys	Girls
With habits	434 (18.5)	183 (13.8)
Without habits	1907 (81.5)	1139 (86.2)
Total	2341 (100.0)	1322 (100.0)
Inference	χ^2=13.300; P<0.001**	

**: Chi – Square Test, $P < 0.001$

Table 4: Prevalence of oral habits in different age groups.

Age group	Total number	%	95% CI
Group 1 (5-7)	355	57.54	53.60-61.38
Group 2 (8-10)	249	40.36	36.56-44.28
Group 3 (11-13)	13	2.11	1.24-3.67
Total	617	100.0	-

CI: Confidence interval

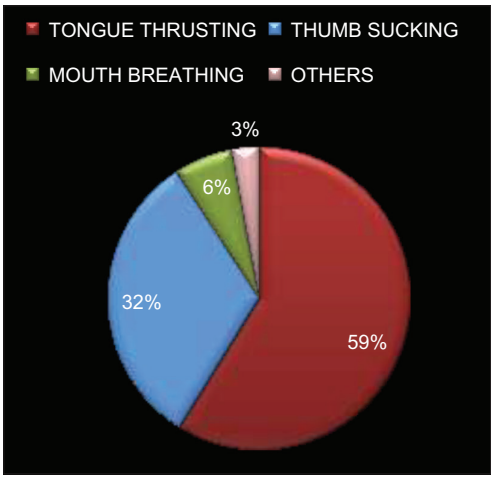
statistically significant ($P < 0.001$). Mouth breathing was found to be 14.1% in boys and 1.7% in girls. Other habits were 2.4% in boys and 0.5% in girls, but the difference was not statistically significant (Graph 3).

IV. Prevalence of oral habit depending upon different age groups

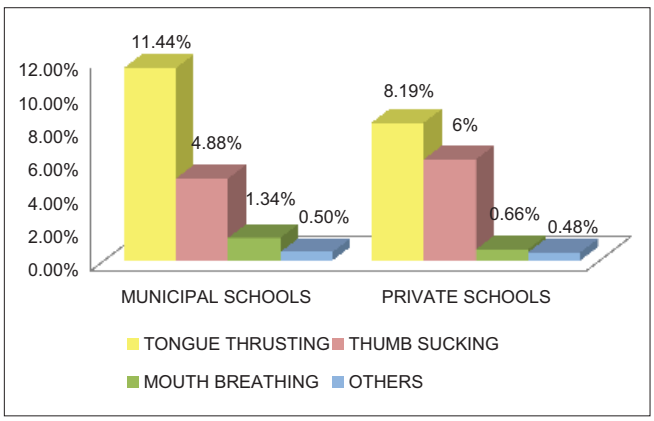
From the study, it is clear that with the increase in age, there was a decrease in the prevalence of oral habit. Tongue thrusting was highly prevalent in Group 2 (12.4%) whereas thumb sucking was found to be more prevalent in Group 1 (6.4%). The only habit that was significantly prevalent in Group 3 was tongue thrusting, which was about 3.4%. The difference in the prevalence of tongue thrusting and thumb sucking in different age groups was statistically significant (Graph 4).

Oral habit and malocclusion

In the study, 33.54% children had no obvious malocclusion, 30.63% children had Class I malocclusion whereas 29.1% had Class I Type II malocclusion. Prevalence of Class II division I was 6.8%, but the difference was statistically insignificant (Table 5). Out of the total study population of anterior open bite, 35.8% was found in children with oral habits (Table 6). Among these 23.35% was present with thumb sucking habit (Figure 1a and b) and 30.85% with tongue thrusting habit (Figure 2a and b). The prevalence of posterior crossbite was 0.64%, which was found only in thumb-sucking children (Table 7).



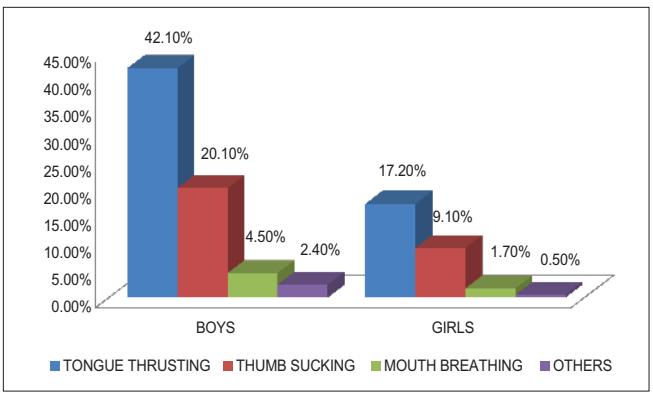
Graph 1: Prevalence of individual oral habit in the total study population.



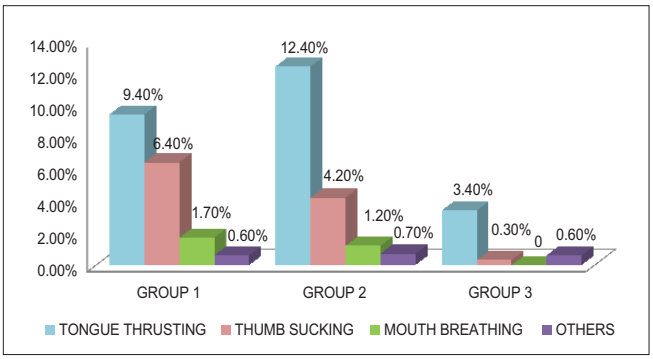
Graph 2: Prevalence of individual oral habits depending upon the type of school.

Discussion

Habits are acquired automatisms, represented by an altered pattern of muscle contraction with complex characteristics, which proceed unconsciously and on a regular basis.[10] The early sucking responses are necessary for the survival of the infant and play an important role in the early exploration of the child's environment. Psychologists include the development of habits as a part of the normal sequence of maturation in children and recognize that these activities have the potential to become a



Graph 3: Prevalence of individual oral habits in different sex.



Graph 4: Prevalence of individual habits in different age groups.

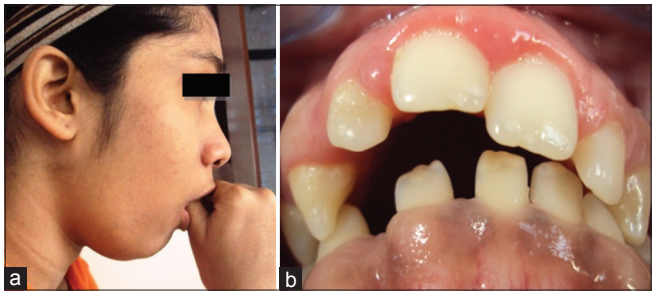


Figure 1: (a) Thumb sucking (b) associated anterior open bite.

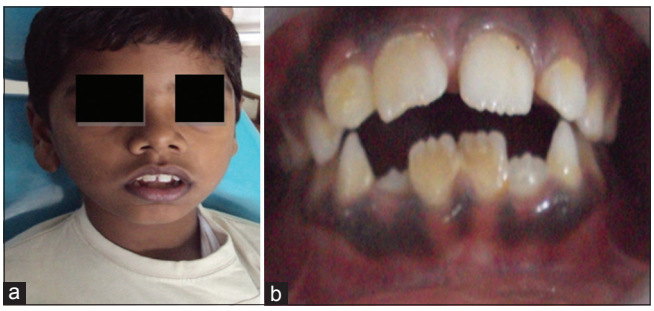


Figure 2: (a) Tongue thrusting (b) associated anterior open bite.

Table 5: Oral habits and molar relation.

Molar relation	Total (%)
No malocclusion	207 (33.54)
Class I	189 (30.63)
Class I Type 1	179 (29.01)
Class II Division 1	42 (6.80)
Class II Division 2	3 (0.48)
Class III	0
Inference	χ^2=1.188; *P*=0.552

Table 6: Prevalence of malocclusion.

Malocclusion	Habits		
	N	Habit (%)	No habit (%)
Posterior crossbite	16	4 (0.64)	12 (7.55)
Anterior open bite	368	221 (35.81)	147 (92.45)
Total	384	225 (58.59)	159 (41.40)
χ^2=157.50, d.f.=1, highly significant, *P*<0.01			

Table 7: Prevalence of malocclusion in relation to individual habits.

Habits	Posterior crossbite (%)	Anterior open bite (%)
Thumb sucking (197)	4 (2.03)	46 (23.35)
Tongue thrusting (363)	0	112 (30.85)
Mouth breathing (39)	0	2 (5.12)

problem or bad habit, under the circumstances of physical, mental stress, and socio-economic stress.[11] However, there are very few reports in the literature describing a coordinated and thorough psychological investigation associated with oral habits that may enlighten the causative factors associated with oral habits. Hence, an attempt was made in the present study to find out the prevalence of oral habits in young children and adolescents and to correlate them with different biological variations.

The findings of this study showed that 617 children (16.8%) had at least one oral habit. Children in the age group between 5-13 years are in the phase of learning to control their emotions. Emotional disturbances such as lack of care and love, too much fear and anxiety, might be the predisposing factors for oral habits.[12] The results of our study were in accordance with the results of Nanda *et al.* (1973) who studied children in Lucknow and reported 17% prevalence of oral habits in children aged 5-12 years.[13] In contrast, Guaba *et al.* (1998) found only 3% of children showing the presence of oral habits in the age group of 6-15 years in Haryana.[5] When the total prevalence of oral habit in boys and girls was compared, the difference was found to be statistically significant with the prevalence being more in boys (18.5%) as compared to girls (13.8%). It was also observed that oral habits persisted for longer periods in boys than girls, especially tongue thrusting. These findings were in accordance with findings of Massler.[11] In contrast to above-mentioned studies, Baalack and Frisk in a retrospective study done on Swedish children found 30.7% prevalence of oral habits with a higher incidence in girls.[14] The habits were more prevalent in municipal schools (19.3%) as compared to the private schools (13.9%), the difference being statistically significant. This difference could be attributed to the difference in their lifestyle and socio-economic status. However, it was observed that the thumb sucking habit was more prevalent in private schools. According to Larsson and Dahlin, the prevalence of finger sucking habit was more in children of modern western society (Sweden) when compared to children staying in under-developed areas of Africa (Zimbabwe).[15] The prevalence according to different age groups showed a tendency of decrease in oral habits with advancing age.[14] The possible reason for the drop of habit with the advancing age can be attributed to the peer pressure influence.[16] The only habit that persisted in age group between 11 and 13 years was tongue thrusting (3.4%).

Prevalence of individual habits

Tongue thrusting

In this study, tongue thrusting was the most common oral habit (58.8%) which is in accordance with the findings of Kharbanda *et al.*,[17] Tongue thrusting was found to be the most prevalent common habit in all the three age groups but its prevalence was highest in Group 2 (12.4%). This is because the presence of transient tongue thrust was taken into the consideration while recording the tongue thrust. It was the only habit persisting in age Group 3 which can be attributed to already settled malocclusion.

Thumb sucking

Most of the children are engaged in non-nutritive sucking (NNS) habit associated with hunger, shyness, sleeping, psychological development, fatigue, and development of the face and dorsal structure.[18] Thumb sucking was second most common oral habit (31.9%). The prevalence of thumb sucking in boys was 20.3% and 9.1% in girls. The prevalence was significantly higher in age Group 1 (6.4%) as compared to Group 2 (4.4%) and Group 3 (0.3%). These results were in accordance with Shetty and Munshi .[6] Bayardo *et al.*,[19] Infante,[20] Popovinch[21] demonstrated that thumb sucking was more common and persistent habit in girls than boys. Benjamin found no prevalence of sucking habit in Eskimo children in Canadian arctic region and he explained it as thumb sucking is a result of an opportunity to learn a habit,

and as child is constantly at his mother's back with a bottle of milk continuously in his hand.[22,23] There have been two major theories regarding the cause of thumb sucking habit: (1) Psychoanalytical theory of psychosexual development and learning theory, suggesting that continuation of the habit is the manifestation of an underlying psychological disturbance and is therefore a mechanism for stress management, (2) the second theory suggests that NNS stems from an adaptive response and assumes no underlying psychological cause but is an adaptive behavior.[24]

Mouth breathing

Mouth breathing can be related to a variety of causes, including enlarged adenoids, tonsils and nasal concha, obstructive nasal septum displacement, allergic rhinitis, nasal or facial deformities and, more rarely, by foreign bodies.[25] The prevalence of mouth breathing in the present study was 6.3% with 4.5% prevalence in boys and in age Group 1. However, there was no significant difference between age and gender. Shetty and Munshi showed 4.6% prevalence of oral habits in the children of Mangalore.[6] Kharbanda *et al*. reported the prevalence of mouth breathing to be 6.6% in school going children of Delhi with a higher prevalence in boys.[17]

Other habits: (lip biting, lip sucking, palm biting)

The prevalence of other habits was 2.9%, showing a higher prevalence in municipal schools. It was seen in age Groups 2 and 3 and in boys (2.4%). However, values were statistically insignificant. Bayardo *et al*. reported a prevalence of 6.9% lip biting,[19] whereas Shetty and Munshi reported 6% prevalence of lip biting with higher incidence in girls.[6]

Malocclusion

Anterior open bite and posterior cross bite

The prevalence of malocclusion in the children with oral habits showed that the prevalence of Class I malocclusion was 30.63%, which included crowded teeth, rotated teeth, etc., whereas the prevalence of Class I Type 2 was 29.01% that included only the anterior open bite. Class II Division 1 was 6.8% and Class II Division 2 was 0.48%, which was not statistically significant (Table 5). Shetty and Munshi reported that about 28.95% had malocclusion with higher prevalence in relation to Class I Type 2 and Class II Division 2.[6] Guaba *et al*. reported only 3 % prevalence of malocclusion in children with oral habits.[5] In our study, the prevalence of anterior open bite was (35.81%) among the children with oral habits. It was found in the present study that the anterior open bite was 23.35% in children with thumb sucking and 30.85% in children with tongue thrusting. Tongue thrust swallowing is seen primarily in two circumstances: In younger children with reasonably normal occlusion, in whom it represents only the transitional stage in the normal physiologic maturation and in individuals of any age with displaced incisors, in whom it's adaptation to the space between the teeth. A tongue thrust should be considered as the result of displaced incisors, and not the cause. The present study findings on the relationship between oral habits and Angle's classification of molar relationships were not statistically significant.

Conclusion

In more developed parts of the world where the specialties of orthodontics and pedodontics have been established, adequate basic information is available on the prevalence of malocclusion. In developing nations, such information still lacks. Thus, there is a need to intensify oral health education in our environment, targeted at both parents and school children to enable them to get benefit from the interceptive orthodontic care, which has numerous advantages.

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