



Frequency of Dysfunctional Habits Epidemiological Profile in A Group of Preschoolers from Iztapalapa, Mexico City

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Abstract

The aim of this study was to evaluate frequency and distribution of dysfunctional habits and their relationship with age and sex, in a group of preschoolers from Iztapalapa in Mexico City. Methodology. A cross-sectional study was carried out in 351 preschool children, both sexes. The epidemiological survey consisted of the oral examination prior to standardization of a Dental Surgeon ($\kappa = 0.911$) and the application of a questionnaire (Cronbach's $\alpha = 0.832$). To measure the reliability of the questionnaire, the Cronbach's α value was calculated and for the associations between the study variables, Pearson's Chi-square and Mantel and Haenszel's Chi-square were calculated for tetraoretical contingency tables. Results. 69.5% of the preschoolers presented at least one dysfunctional habit. Onychophagia (30.2%), mouth breathing (10.3%) and finger sucking (9.7%) were the habits with the highest frequency. The frequency of dysfunctional habits was associated with age ($X^2=14.636$, $p=0.001$), but not by sex ($X^2_{MH}=0.043$, $p=0.836$). Conclusions. The frequency of this type of oral habits turned out to be variable compared to that reported for other populations with similar characteristics, which allows us to recognize that biological and social conditions may be influencing this behavior.

Keywords: Preschoolers; Dysfunctional habits; Cross-sectional study; Onychophagia; Thumb sucking

Introduction

A habit is a behavior that is acquired by the constant repetition of certain actions present in daily life [1-5], in this sense, dysfunctional oral habits are acquired customs or practices that their constant repetition lacks functionality, which initially can be performed consciously, but if their activity is prolonged, it can become an involuntary habit that can cause alterations in orofacial development [6-11].

Its etiology is multifactorial, however, the most frequent causes are caused by stress, anxiety, fear, or because doing it produces pleasure, safety and well-being to the child. Its frequency is variable, since cases ranging from 40.7% in Colombian children [12] to 67.3% in Indians [11] have been observed, without any type of relationship having been demonstrated so far in terms of sex or age. However, with regard to this last variable, it seems that the epidemiological behavior of this type of habits can be distributed differently depending on the age group to which it refers, thus, both the prolonged use of the pacifier and the bottle are usually more frequent in children of the mother-infant group, onychophagia and finger sucking are the most prevalent in preschool and schoolchildren [12-18].

Non-nutritive sucking, carried out with the pacifier, finger or lips, adopted in most cases in the absence of breastfeeding or due to oral gratification received, have also shown a variable behavior, for example, in the case of finger sucking the Reports indicate that it presents with a great variability that goes from 7.9% to 49.3% in children [14,19-21]. Cheilophagia, which consists of a habit of compulsively chewing on the lip, preferably the lower lip, causes an incessant retraction of the jaw, a condition that modifies the intensity of muscular activity and therefore alters the harmony of

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the relationship between the teeth. Yes. Its appearance is most frequently associated with lifestyle conditions and the quality of the intra-family relationship [8,11,21]. The occurrence of this habit has been reported with a variability ranging from 1.92% in Brazilians [22] to 18.3% in Nigerians [17].

Onychophagia is a habit that is commonly observed in childhood and adolescence, it is an unusual habit before the age of 3 and it is noted that its frequency increases with increasing age. It is usually associated with situations under stress or of some anxiety origin for the child. Like object biting, they are undesirable habits because they interfere with occlusion and oral hygiene. Their importance lies in the fact that they can influence the dental position, due to the fact that inappropriate forces are exerted on the lingual surfaces of the anterior maxillary teeth, causing displacements in the labial direction [23-25]. The variability with which it is observed ranges from 17.1% in Mexican children 14 to 58.0% in Ecuadorians [7], not so, in relation to the habit of biting objects whose frequency ranges from 1.5% in Mexican children 14 to 33.0% in Nigerians [17]. In relation to mouth breathing, the child discovers that he can breathe through the mouth when for some reason the upper respiratory tract is impeded or functionally limited, due to obstructions of the upper airways, deviations of the septum, inflammation of the basement membrane or due to the inflammation of the turbinates, which causes it to try to compensate by placing the tongue lower, altering the entire support of the upper teeth and facilitating the occurrence of a malocclusion [26-29]. Its presence is also variable, since it has been observed in a range that goes from 11.1% in Indians [26] to 49% in Nigerian children [17]. Regarding lingual protraction, this habit consists of placing the tongue between the teeth, either in the anterior area at the incisor level or between the lateral sectors at the molar level, mainly during swallowing and phonoarticulation functions. The epidemiological behavior of this habit also shows significant variability since it has been observed in 5% in Brazilians [27] to 66.2% in Mexican children [14].

The objective of this research work was to evaluate the frequency and distribution of this type of dysfunctional habits and their possible relationship with age and sex in a group of preschoolers from the Izatapalapa Mayor's Office, Mexico City.

Material and Methods

Study design and participants

A descriptive study was carried out, in the cross-sectional modality, in which a convenience sample made up of 351 preschoolers enrolled in the "Army of the East" kindergarten, located in the Izatapalapa City Hall, Mexico City, was studied. 45 children were excluded from the study due to three conditions: 1) Because their parents did not authorize their inclusion in the study, 2) Because they were not present on the day of the epidemiological survey, or 3) Because the child refused to be examined.

Ethical and legal considerations of the study

The project had the endorsement of the Bioethics and Biosafety Committee of the Dental Occlusion Research Line (LIFESZ-230506), attached to the Faculty of Higher Studies Zaragoza, of the National Autonomous University of Mexico. Likewise, informed consent was requested from the parents or guardians so that he and his son could be included in the study. During the calibration of the examiner and the epidemiological survey, the provisions of the technical standard of the Mexican Ministry of Health (NOM013-SSA2-200635), which regulates the regulations for the prevention of infection transmission, were taken into consideration.

Examiner standardization

For the epidemiological survey, a dental surgeon was calibrated through the direct method, ensuring its reliability by calculating absolute and relative concordances and Cohen's kappa coefficient, thus avoiding that said concordances were due to chance (digital suction Kappa = 0.849. P = 0.01; mouth breathing Kappa = 0.991. P = 0.0001; onychophagia Kappa = 0.928. P = 0.001; atypical swallowing Kappa = 0.940. P = 0.001; tongue protraction Kappa = 0.933. P = 0.0001; cheilophagia Kappa = 0.899. P = 0.001; bite of objects Kappa = 0.926. P = 0.001; lip suction Kappa = 0.879. P = 0.01 and use of bottle Kappa = 0.927. P = 0.001). For the questionnaire, the value of the Cronbach's alpha coefficient was calculated, which turned out to be equal to 0.832, which proved to be a fairly homogeneous and reliable instrument means.

The epidemiological survey was carried out in a school classroom during class hours by a Dental Surgeon, illuminating the clinical field with a BORUIT®, USA, rechargeable headlamp, with 1200LM white light, disposable gloves and a flat dental mirror of the # 5, no Hu-Friedy® brand magnification. Each parent or guardian was administered a questionnaire in order to confirm the presence of any of the dysfunctional habits of interest in the study.

Variables and clinical assessment

The dysfunctional oral habits that were studied in preschool children were: finger sucking, lip sucking, onychophagia, tongue protraction, cheilophagia, object biting and mouth breathing, as well as their distribution by age and sex. During the clinical examination the fingers were explored verifying their cleanliness and evidence of calluses; Regarding the lips, it was observed if the upper one covered two thirds of the incisors, likewise, if the closing of the lips was carried out smoothly without forcing the lower one. If the lower lip was located without alterations in relation to the upper lip and if it showed irritation of the skin around the lower lip. Examination of the nose made it possible to identify the contour of the nasal flaps and to observe the sealing of the lips during the act of breathing; Regarding the fingers, the situation of the nails and cuticles was considered to verify the existence of some type of wear or bite of these, or the presence of inflammation or infection; Finally, the contour, insertion and tonicity of the buccinator, orbicularis and tassel muscles of the chin were verified.

Statistical methods

For the statistical analysis, the statistical package SPSS v. 21.0 (IBM, USA) for Windows was used. To measure the presence of parafunctional oral habits, frequencies and proportions were calculated. To measure the reliability of the questionnaire, the value of Cronbach's Alpha Coefficient was calculated. To determine the association between each habit with sex, the Mantel and Haenszel Chi-square value was calculated because the variables were nominally measured and the data presented in tetraoretical tables, in the case of the frequency of these habits and their possible Association with age, Pearson's Chi-square was calculated taking into account the condition that if the value of any of the cells was ≤ 5 , the Likelihood Ratio value was considered. In all cases it was contrasted with a confidence level of 95%. The tables were designed in Office Microsoft® Excel v. 365.

Results

The study sample consisted of 351 preschoolers of whom 20.50% were 3 years old, 35.60% 4 years old and 43.90% 5 years old, with a representation by sex of 57.50% for the

	Age							
	Below 4 Years		4 Years		5 Years		Total	
Sex	f	%	f	%	f	%	f	%
Girls	36	10.3	70	19.9	96	27.4	202	57.5
Boys	36	10.3	55	15.7	58	16.5	149	42.5
Total	72	20.5	125	35.6	154	43.9	351	100

Table 1: Distribution of the preschool sample by age and sex.

	Frequency	Percentage
Para Functional Habits		
Absent	107	30.5
Present	244	69.5
Digital suction		
Absent	318	90.3
Present	34	9.7
Lip suction		
Absent	318	90.6
Present	33	9.4
Onychophagia		
Absent	245	69.8
Present	106	30.2
Cheilophagy		
Absent	332	94.6
Present	19	5.4
Bite objects		
Absent	331	94.3
Present	20	5.7
Glass seating		
Absent	318	90.6
Present	33	9.4
Mouth breathing		
Absent	315	89.7
Present	36	10.3

Table 2: Percentage distribution of parafunctional habits

female and 42.50% for the male (Table 1). The presence of dysfunctional habits in the population showed that (69.5%) of the minors presented at least one habit, of these, (13.7%) had up to two habits and (0.6%) up to three habits simultaneously. Onychophagia was the habit with the highest frequency (30.2%), followed by mouth breathing (10.3%) and finger sucking (9.7%). Likewise, the habits that occurred less frequently were object biting and cheilophagia, 5.7% and 5.4% respectively (Table 2). The behavior on the distribution of these habits by age showed that the older their age increased their frequency (11.4% at 3 years, 28.8% at 4 years and 29.3% at 5 years), showing a highly significant statistical association ($X^2_{MH} = 14.636$, $p = 0.001$); Finger sucking occurred more frequently in children aged 4 years (4.0%), at 3 years (2.30%) and at 5 years (3.4%), with no relationship between the two variables ($X^2_{MH} = 1.126$, $p = 0.569$). Lip sucking occurred more frequently at the age of 4 years (6.0%), at 3 years (2.0%) and at 5 years (1.4%), differences that also turned out to be statistically significant (Likelihood ratio = 14.890, $p = 0.0001$). Onychophagia prevailed in 5-year-

old preschoolers (17.9%), at 3 years (0.3%) and at 4 years (12.0%), where a great association with this variable was evidenced (Likelihood ratio = 51.510, $p = 0.0001$). Glossophagia was slightly more frequent at 4 years (4.6%) compared to 3 and 5 years, with no evidence of any association between the two (Likelihood ratio = 2.591, $p = 0.274$), regarding cheilophagia, its Presence was greater at the age of 5 years (4.8%), as was the onychophagia, at 4 years (4.8%) and at the age of 3 years, no cases were reported, finding differences in the behavior of the variables, resulting in statistically significant (Likelihood ratio = 20.288, $p = 0.0001$).

The habit of biting objects was presented with a frequency slightly similar to the habit of cheilophagia, both in the frequency and in the association between these variables (Likelihood ratio = 9.693, $p = 0.008$). Finally, mouth breathing occurred more frequently at the age of 5 years (4.8%), also with evidence of a relationship between the variables in question (Likelihood ratio = 12.239, $p = 0.002$) (Table 3). Regarding the distribution of dysfunctional habits by sex, it was observed that it was more prevalent in girls (39.3%) compared to boys (30.20%). The

Age									
3Years			4Years		5Years		Total		Significance
	f	%	f	%	f	%	f	%	
Presence of atleastonehabit									
Yes	40	11.4	101	28.8	103	29.3	244	69.5	
No	32	9.1	24	6.8	51	14.5	107	30.5	
									p=0.001*
Digital suction									
Present	8	2.3	14	4	12	3.4	34	9.7	
Absent	64	18.2	111	31.6	142	40.5	317	90.3	
									p=0.569
Lipsuction									
Present	7	2	21	6	5	1.4	33	9.4	
Absent	65	18.5	104	29.6	149	42.5	318	90.6	
									p=0.0001*
Onychophagia									
Present	1	0.3	42	12	63	17.9	106	30.2	
Absent	71	20.2	83	23.6	91	25.9	245	69.8	
									p=0.0001*
Glasseating									
Present	5	1.4	16	4.6	12	3.4	33	9.4	
Absent	67	19.1	109	31.1	142	40.5	318	90.6	
									p=0.274
Cheilophagy									
Present	0	0	2	0.6	17	4.8	19	5.4	
Absent	72	20.5	123	35	137	39	332	94.6	
									p=0.0001*
Bite of objects									
Present	0	0	8	2.3	12	3.4	20	5.7	
Absent	72	20.5	117	33.3	142	40.5	331	94.3	
									p=0.008*
Mouthbreathing									
Presente	14	4.00%	5	1.40%	17	4.80%	36	10.30%	
Absent	58	16.50%	120	34.20%	137	39.00%	315	89.70%	
									p=0.002*
									*≤0.05

Table 3: Percentagedistribution of cases of parafunctional oral habitsbyage.

digital sucking habit occurred more frequently in the female sex (5. 4%) and in the male sex (4. 3%) without statistically significant evidence ($X^2_{MH} = 0. 043$, $p = 0. 836$), as far as the lip sucking habit was presented similarly to the previous habit, girls reported (6. 6%) and boys (2. 8%), without a statistically significant difference ($X^2_{MH} = 2,200$, $p = 0. 138$). The habit of onychophagia and glossophagia were performed more frequently by girls (16. 2% and 6. 3%) and by boys (14. 0% and 3. 1%) respectively, however, these differences were not statistically significant ($X^2_{MH} = 0. 886$, $p = 0. 346$ and $X^2_{MH} = 1. 239$, $p = 0. 266$). Cheilophagia and object biting occurred more frequently in girls (3. 7% and 3. 4%) and in boys (1. 7% and 2. 3%) respectively, however, there was no relationship between these variables ($X^2_{MH} = 0. 972$, $p = 0. 324$ and $X^2_{MH} = 0. 052$, $p = 0. 819$). Finally, the habit of mouth breathing, like the previous habits, occurred more frequently in females (5. 4%) and in children (4. 8%), which also did not show statistical relevance with respect to sex ($X^2_{MH} = 0. 374$, $p = 0. 541$) (Table 4).

Discusión

According to what was observed in the study population, the frequency of dysfunctional oral habits in preschool children was higher compared to that reported by Rodríguez *et al.* [1] in Cubans and by Murrieta *et al.* [14] in Mexicans, but it was lower than that observed by Machado *et al.* [15] in Portuguese. According to the age variable, the behavior showed that as it increased, the frequency of habits was also higher, which turned out to be statistically significant, showing that there is a relationship between this variable and the study event; Therefore, it seems that age was a cumulative risk factor for developing this type of habit, an event that was similar to that observed by AlSadhan *et al.* [4] and Dhull *et al.* [11] who identified that the beginning of the development of this type of habits begins from the age of two and can last up to six years, increasing its frequency as one gets older [18,19]. The relevance of finding these types of

Sex							
Boys			Girls		Total		Significance
	f	%	f	%	f	%	
Presence of at least one habit							
Yes	106	30.20%	138	39.30%	244	69.50%	
No	43	12.30%	64	18.20%	107	30.50%	
							p=0.570
Digital suction							
Present	15	4.30%	19	5.40%	34	9.70%	
Absent	134	38.20%	138	52.10%	317	90.30%	
							p=0.836
Lip suction							
Present	10	2.80%	23	6.60%	33	9.40%	
Absent	139	39.60%	179	51.00%	318	90.60%	
							p=0.1
Onychophagia							
Presente	49	14.00%	57	16.20%	106	30.20%	
Absent	100	28.50%	145	41.30%	245	69.80%	
							p=0.346
Glass seating							
Presente	11	3.10%	22	6.30%	33	9.40%	
Absent	138	39.30%	180	51.30%	318	90.60%	
							p=0.266
Cheilophagy							
Presente	6	1.70%	13	3.70%	19	5.40%	
Absent	143	40.70%	189	53.80%	332	94.60%	
							p=0.324
Bite of objects							
Present	8	2.30%	12	3.40%	20	5.70%	
Absent	141	40.20%	190	54.10%	331	94.30%	
							p=0.819
Mouthbreathing							
Present	17	4.80%	19	5.40%	36	10.30%	
Absent	132	37.60%	183	52.10%	315	89.70%	
							p=0.541

Table 4: Percentage distribution of cases of parafunctional oral habits by sex.

habits present in preschoolers is because most are dysfunctional or non-physiological, which develop during the initial stage as a replacement or succession of another habit, whose origin may be due to a great psychological load, in particular, a tendency is emphasized for them to appear in the final stages of the preschool cycle and the beginning of school, when the child becomes more aware of his environment [36]. By sex, it slightly predominated in girls, however, this difference was never statistically significant, a behavior similar to that observed by AlSadhan *et al.* [4] and Martínez *et al.* [9], showing that the sex of the preschooler does not matter, both girls and boys seem to have the same probability of developing them, since they can be exposed to similar stress situations [11,14,17]. Onychophagia was the most frequent dysfunctional habit, and its relevance is based on the possible repercussions it has on the oral cavity due to the constant production of microtrauma and gingivitis [18,37,42]. Mouth breathing was the second most frequent, which was observed

to a lesser extent than that reported by Dickmar *et al.* [2] in Venezuelans and Murrieta *et al.* [14] in Mexicans, but higher than that reported by Silva *et al.* [16] also in Mexicans. Its relevance from the clinical point of view lies in the fact that it must be identified in the most timely manner possible to avoid generating alterations that have an impact on development, such as: postural misalignments, recurrent infections, decreased cognitive activity, affectations in self-esteem, among other. It is also important, since this habit is considered an etiological factor for the establishment of a malocclusion, particularly of Angle's classes II and III [16,43]. On the other hand, digital suction was lower than expected compared to that reported by AlSadhad *et al.* [4] and Rodríguez *et al.* [1] in Saudis and Cubans, however, it was higher than that observed by Alves *et al.* [20] and Murrieta *et al.* [14] in Brazilian and Mexican preschoolers, relevant behavior since at the beginning or early ages it is considered as part of the maturation process of children, but if it continues beyond four years, there

is talk of regressive behaviors, becoming a habit difficult to eradicate. Its duration, frequency, direction and intensity, added to an unfavorable skeletal pattern, can cause various alterations such as open bite, mandibular retrognathism, reduced chewing function, language problems, hyperkeratosis and infections in the sucked fingers, among others, affecting the social, emotional and family areas of the child's life [6,24,28]. The frequency of the habit in this group of preschoolers reinforces the idea about the behavior of any event that is not necessarily linear, since it can be influenced by multiple factors that vary from subject to subject. Lip sucking and cheilophagia occurred less frequently than that reported by Rodríguez *et al.* [1] and Onyejaka *et al.* [23], but similar according to what was observed by Caruso *et al.* [10] and Dhull *et al.* [11] in Italians and Indians. These habits are important because children develop them as a way to reduce emotional and psychological tensions, such as anxiety and stress, which leads to a point of reflection on the tranquility and safety of the environments in which children are develop [37,19]. In the case of lip sucking, it is usually little reported and even the criteria for evaluating its frequency in the population are not completely homogeneous, being an important reason why its study should be expanded and more reliable diagnostic criteria standardized to identify its presence. In children, however, it has been established that in most cases the presence of this habit as a consequence of a malocclusion; characterized fundamentally by the tendency it has for the development of other alterations such as the open bite and the increase in the horizontal overbite [1,14]. On the other hand, the frequency of glossophagy was surprisingly higher than expected, exceeding the results of Shulman *et al.* [29] in Americans, but on a smaller scale than that observed by Majorana *et al.* [30] in Italian. Its assessment is of great importance since the stomatologist during clinical practice does not always make a correct diagnosis of this habit. Its implications are relevant due to the close relationship with lesions in the oral mucosa due to systemic diseases such as Lesh-Nyhan syndrome and cerebral palsy [4]. Regarding the bite of objects, it was observed that it had a behavior similar to cheilophagia, its frequency was low compared to that reported by Onyejaka *et al.* [23] in Nigerians. The fact that it is observed more frequently as the age advances may have the origin in which it is considered a habit of replacement or succession. If it is not eliminated correctly, the first habit of childhood will have relapses in later stages. Furthermore, it has been observed that children adopt chewing to release emotional tensions and to compensate for chewing forces [28]. Finally, it can be concluded that the frequency of this type of habits was not as high in the population, showing some differences in According to the age group in the presence of some habits, but it was expected since their behavior can be influenced by the age at which the child is, its relevance is a function of being able to eradicate them and thus prevent the dental occlusion is altered.

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