

## Original articles

# Feeding preference of mouth breathers of an elementary school

## *Preferência alimentar de respiradores orais de uma escola de ensino fundamental*

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## ABSTRACT

**Purpose:** to know the preferred alimentary consistency kind of the mouth breathers with school age of the fundamental teaching.

**Methods:** the study included 13 students of both genders of the fundamental teaching between 10 and 14 years old. The selection happened through of observations about students in class and through the clinic exam with otorhinolaryngologist and the data were collected during the interviewing.

**Results:** it was observed that 100% of the assessed students showed preference for solid consistency foods. However, it was found that the majority uses liquid during the meals with food in their mouths at the same time, and this fact favors the ingesting of solids.

**Conclusion:** it has been found that there is a higher predominance on choose solid consistency foods, on the range of the students chosen, regardless of the oral breathing way.

**Keywords:** Mouth Breathing; Mastication; Feeding; Speech, Language and Hearing Sciences

## RESUMO

**Objetivo:** conhecer o tipo de consistência alimentar preferido pelos respiradores orais em idade escolar do ensino fundamental.

**Métodos:** participaram do estudo 13 estudantes do ensino fundamental, de ambos os gêneros, com idade entre 10 e 14 anos. A seleção ocorreu por meio de observações dos alunos em sala de aula e exame clínico com otorrinolaringologista, sendo os dados coletados mediante realização de entrevistas semiestruturadas.

**Resultados:** foi observado que 100% dos escolares avaliados apresentaram preferência por alimentos de consistência sólida. Porém, constatou-se que a maioria faz uso de líquido durante as refeições na presença do alimento na boca, fator que favorece a ingestão dos sólidos.

**Conclusão:** verificou-se, na faixa de escolaridade estudada, que há maior predominância na escolha por alimentos de consistência sólida, independente do modo respiratório oral.

**Descritores:** Respiração Bucal; Mastigação; Alimentação; Fonoaudiologia

## INTRODUCTION

Breathing is one of the vital functions of living beings developed at the first moment of life, soon after birth, in which the nasal breathing is considered the normal way to do it<sup>1-3</sup>. For the occurrence of nasal breathing, there needs to be anatomical and functional integrity of the upper airways, especially in the nasal region and / or pharyngeal<sup>4,5</sup>. When there is impediment in the nasal breathing pattern, breathing oral takes place immediately<sup>6</sup>.

Therefore for efficient nasal breathing to occur, it is necessary that the mouth closes itself at some point. This may occur before sealing the lips; the back part of the tongue contacts the hard palate, and later the base of the tongue contact the soft palate<sup>7,8</sup>.

In the nasal cavity, the air is filtered, heated and humidified allowing it to reach the lungs clean and in an ideal temperature for oxygenation. While in oral breathing mode, the air reaches the lungs dirty, cold and dry, not promoting a proper preparation of the inhaled air and, therefore it contributes to make the child's body more susceptible to infections, this becomes one of most frequent symptoms in childhood due to pollution and increased allergic agents<sup>2,9-11</sup>.

Mouth breathers can be organic, when there is some mechanical obstruction nasal breathing is more difficult ; they can also be functional, which remain with mouth breathing after removing all mechanical obstacles, and also with special needs, in the case of patients with neurological dysfunction<sup>6,12</sup>.

If the person has nasal breathing, it favors the good performance of the chewing, swallowing and speech functions, the adequacy of the mandibular, tongue, lips and facial expression posture, which, by acting with integrity and being interrelated provide a correct muscle action by stimulating the appropriate facial growth and bone development<sup>1,13</sup>.

The most frequent cause of obstruction of the upper airways are due to organic changes such as nasal polyps, adenoid hypertrophic and / or tonsils, more frequent; allergic rhinitis, deviated septum, sinusitis and nasal turbinate hypertrophy<sup>6,12,14</sup>

Regarding to the adenoids and the tonsils they are present in all children since birth and tend to increase in

size from to 2 to 6 years old, period in which the hyperplasia of all lymphoid tissues occur. The physiological hyperplasia of the lymphoid palatal and pharyngeal of the mass probably explains why the oral breath is common during the 4<sup>th</sup> and 12<sup>th</sup> years of life, and tend to physiologically reduce during puberty and thereafter, when there is atrophy of tonsils and the increased dimensions of the nasopharyngeal airway<sup>2,7,14,15</sup>.

The most common features found are: shortness of breath or respiratory failure, rapid fatigue in the physical activities, back or neck muscles pain, halitosis, dry mouth, choking during sleep, sleep poorly, daytime sleepiness, saliva while talking, irritability , change in chewing, poor concentration followed by poor school performance<sup>3,6,9</sup>.

Knowing that the mouth breathing usually has smell and taste decreased, due to the inadequate use of upper airway<sup>5</sup>. And, it is believed that the choice of the food type is not made by appetite, but by consistency and easiness of ingestion, allowing the individual to continue breathing through the mouth, as well as promoting coordinated breathing / swallowing<sup>9,13,16-18</sup>.

This study aimed to know the preferred type of food consistency by mouth breathers of a primary school, checking whether it ease the adequacy of breathing mode for coordinating breathing / swallowing.

## METHODS

The survey was conducted after approval by the Research Ethics Committee, Opinion No. 733,814 from September to December 2014.

This research consisted of an observational descriptive study which articulated quantitative methods, as frequencies and relations about the collected data were analyzed and the aspects qualitative because they provided a textual writing based on interfaces that emerged from the analysis of the transcribed texts, deepening the understanding of phenomena investigated<sup>19</sup>. Some resources for data collection and semi-structured interviews were used as individual observation. The data were evaluated by means of qualitative variables, using direct questions to the participants according to a script prepared for the interview (Figure 1).

| Interview Guide  |
|--|
| Gender: ( ) female ( ) male  |
| Age: _____   |
| 1. Spend a lot of time with mouth open ?<br>( ) Yes<br>( ) No  |
| 2. Do you have any difficulty in breathing and eating ? Explain.   |
| 3. What kind of food do you prefer? Why ?<br>( ) Solid<br>( ) Liquid<br>( ) Soft                                   |
| 4. Do you drink water or any other liquid during meals? Why ?  |
| 5. Do you feel tired when having meals ? which food specifically ?   |
| 6. Do you eat the meal offered at school ? what do you eat ? do you feel tired ? can that food be offered at home? |

**Figure 1.** Guide for a semi-structured interview

275 students, 136 male and 139 female. The study sample was composed of 18 students aged from 10 to 14 years, of both genders, duly enrolled in morning and afternoon shifts, but considering the exclusion criteria there was a sample reduction. The final sample was determined by 13 students, based on another work, which observed oral breathing<sup>20</sup>. The ages varied from 7 to 14 years old because of hyperplasia of lymphoid mass occurrence in this period, which tend to decrease naturally during puberty<sup>15</sup> and beyond.

The study included children / adolescents aged from 7 to 14 years old, duly enrolled in school, specifically in elementary school, with no sealing somewhere in the oral cavity that underwent clinical examination with the ENT physician. Exclusion criteria: students who refused to participate in the research even after parental consent and students apparently having a cold with nasal obstruction by congestion.

Initially, individual observations were made by the researcher in a nonparticipating way, lasting 50 minutes in each classroom to check the presence of students with no lip seal at resting time, because it was intended to establish the relationship between food and oral breathing. Respondents were observed during their stay in the classroom, and the lack of lip closure at resting time was noticed, and we took down the respondents' names and asked the school board a meeting with the parents and / or legal guardians. At the meeting, parents were informed about the study objectives, both verbally and in writing, and when an agreement was reached the parents signed the Consent and Informed (IC) in two-way, leaving them with one of these.

Thereafter, those students whose parents allowed their participation in the study underwent clinical examination with otolaryngologist through nasal endoscopy to identify the cause of mouth breathing (organic or vicious).

In the third stage, students whose parents allowed their participation in the research and who underwent clinical examination, were taken to psychopedagogy room for research approval and also to have an interview based on semi-structured questions, suffused with open and closed questions, whose researcher was non-participant. The interviews were recorded by a Samsung device (model GT -19063T), so that the literal transcription could be made.

The texts that emerged from the textual analysis were interrelated to the quantitative data analyzed, which are interrelated with theoreticians and the lines of the respondents shown in the text in bold and italics. Ellipses were used inside brackets to indicate that only that part of the speech was transcribed, which means that a long pause existed.

Quantitative data were collected, recorded in an electronic document (Excel 2007), tabulated and presented in graphs, pointing out the frequency of occurrence of responses and their respective percentage.

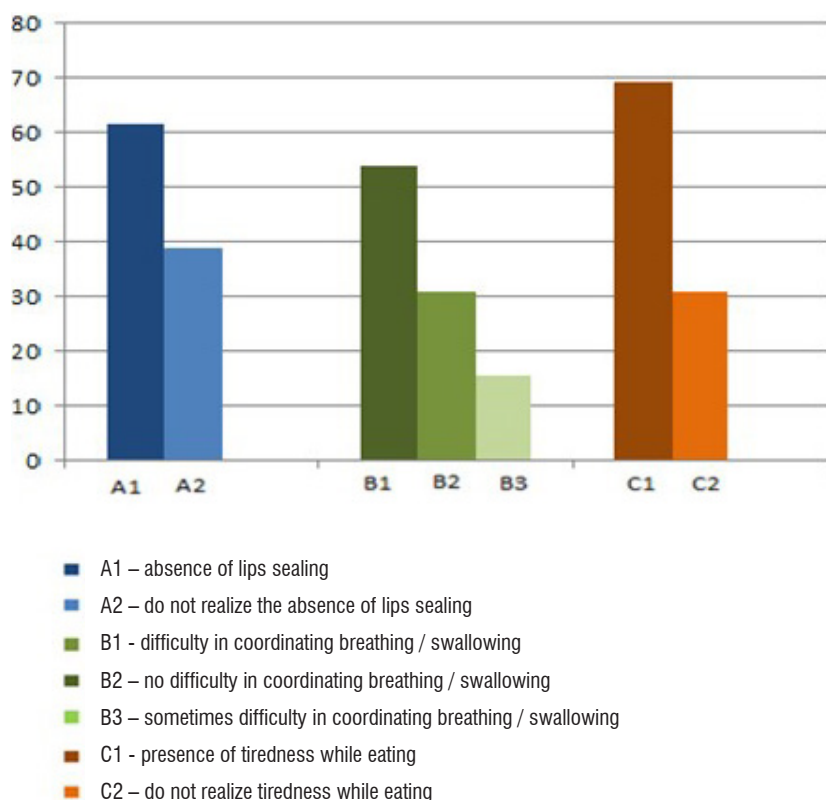
Whereas, the technique used for qualitative data analysis was the content analysis. Procedures for the content analysis were conducted by the researcher: 1) literal transcription of interviews; 2) Vertical analysis: selection of excerpts from each narrative containing the main ideas of the themes explored.

## RESULTS

Regarding to the data obtained from 13 (100%) of respondents of the study, 9 (69.24%) were male and 4 (30.76%) female and the average age was 12/23 years old .

Regarding to nasal endoscopy 8 (61.54%) of the participants had adenoid hypertrophy, and 5 (38.46%) had between 50 and 75% of it and 3 (23.08%) had it higher than 75%; 3 (23.08%), had enlarged tonsils; 8 (61.54%), had hypertrophy of inferior turbinates, 5 (38.46%), nasal mucosal hypertrophy and 1 (7.69%), deviated septum, Which shows that 12 (92.31%) presented organic cause oral breathing with more than one etiologic factor.

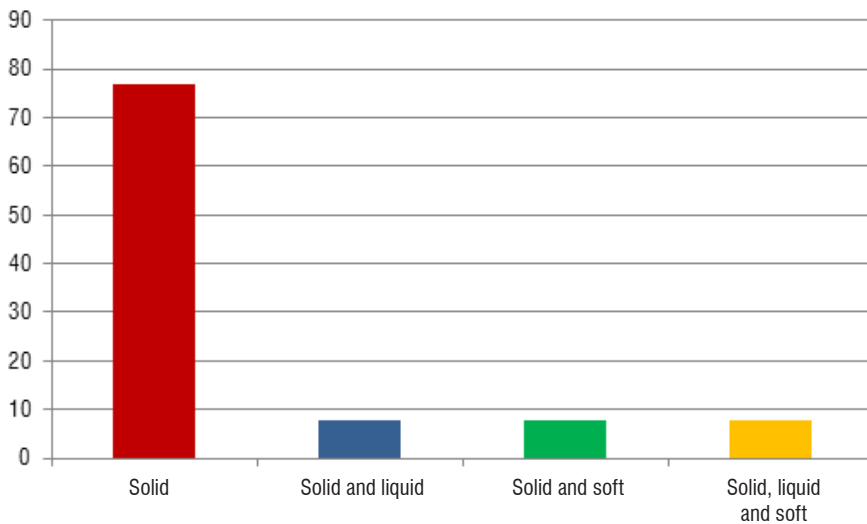
Figure 2 shows the responses of students' self perception, showing that 8 (61.54%) reported long stay with mouth open because of the need to breathe, because they admit to be unable to breathe through the nose. Regarding to the feeling of difficulty in coordinating breathing / swallowing, 7 (53.85%) reported to experience difficulty in breathing and swallowing food simultaneously and, therefore, they need to chew food faster or stop chewing to breathe. Regarding to the presence of tiredness while eating , it was found that 9 (69.24%) reported to experience fatigue while eating, especially food with solid consistency.



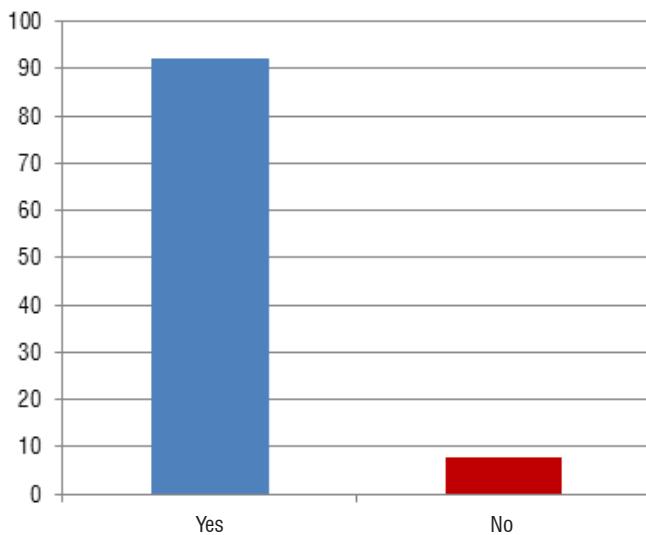
**Figure 2.** Oral breathers self-perception

Regarding to food preference Figure 3, it was found that 10 (76.92%) of the evaluated students showed preference for solid food, justifying that this kind of food strengthens them physically more than the others, 1 (7.69%) for solid and liquid food and 1 (7.69%) enjoyed both solid and soft food and 1 (7.69%) solid, liquid and soft food.

Regarding to fluid intake associated with meals, Figure 4 shows that 12 (92.31%) children ingest some kind of liquid (water, juice, soda) during meals to help swallow food faster and also to decrease the sensation of breathlessness and suffocation. Only 1 (7.69%) ingests liquid after meals.

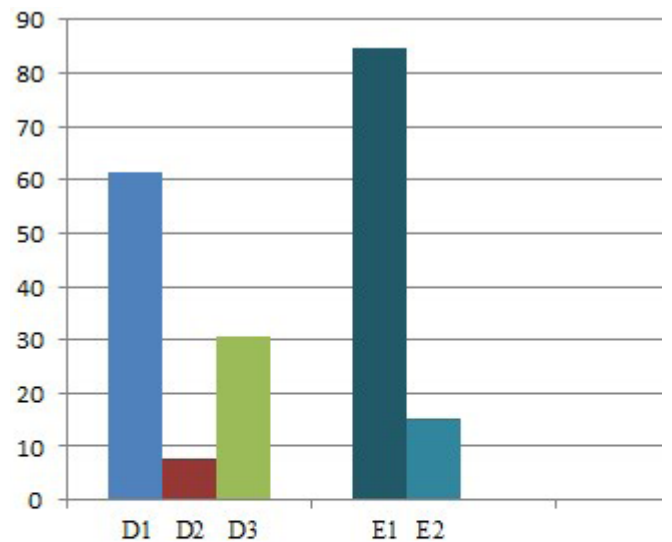


**Figure 3.** Favorite types of food consistency by mouth breathers



**Figure 4.** Liquid intake associated with meals

The results presented in Figure 5 shows the relationship between school feeding and home feeding, in which 8 (61.54%) students reported to be fed on school meals, stating that it may be a power option at home. 4 (30, 77%) reported that they only eat school food when they do not bring a snack from home, and only 1 (7.69%) reported not to like the meals offered at school and therefore he/she does not eat it at all. As the predominant type of consistency at home and at school, it was found that most (11 (84.61%)) were offered the same type of food at school and at home.



- D1 - Feed themselves on school meals
- D2 - Do not feed themselves on school meals
- D3 - Sometimes feed themselves on school meals.
- E1 - Similar consistency to the one that prevails at home
- E2 - Different consistency to the one that prevails at home

**Figure 5.** Relationship between school and home food

## DISCUSSION

It was observed in this study a greater prevalence of oral breathing in males, which has corroborated with the findings from other studies that have also observed this male domain as a result of the fact that facial growth occurs more slowly in this genre<sup>11,13,21</sup>.

Regarding to the perception of the participants, it can be observed that more than half were able to realize the absence of lip seal. According to them they breathe through their mouth because they have difficulty in breathing through the nose. (...) **I do not like to breathe through the nose, because I cannot breathe through the nose.** This difficulty is presented according to the nasal endoscopic results, since most participants presented obstruction of the upper airways and the main cause is hypertrophic adenoids, hypertrophy bilateral inferior turbinates and tonsillar hypertrophy. This finding is in line with another study that says that when there is impairment of nasal breathing, oral breathing is settled. The most common organic causes of nasal obstruction are: hypertrophy of adenoids, allergic rhinitis, deviated septum, sinusitis, hypertrophy turbinates and chronic infections of the tonsils<sup>6</sup>.

Regarding to the feeling of difficulty in coordinating breathing / swallowing, they experienced difficulty because they must stop chewing or chew the food faster to be able to breathe. **When I'm eating I feel very breathless, then I need to stop eating in order to breathe.** Another respondent said: **So ... when I eat, I have to eat fast because sometimes I feel breathless** but I eat little, by little so that I will not become breathless, and so on! Regarding to the presence of fatigue when feeding themselves, They reported fatigue especially when eating solid food, as seen in the responses evaluated: **Sometimes I get tired when eating food like rice, beans ... and so on! And I get tired when I eat pasta, as soon as I start to swallow I'm breathless ... then I drink water.** Thus, the observed responses confirm the findings in another study<sup>13</sup>, which says that the changes that occur in the respiratory pattern may lead to faster chewing, since the chewing and swallowing take place in the same period of time that we breathe causing the feeling of suffocation in the individual, therefore the individual may feel tired feeding themselves. It is worth noting that some of the mentioned foods that cause fatigue are part of the preferred ones both at home and at school, they are: pasta, beans, rice and couscous.

From the data analysis of this research, it can be observed that all evaluated participants showed a preference for solid food. **I prefer solid food such as rice, beans, pasta, meat, chicken, couscous ... eggs, because I think ... they fill me more, because when I eat porridge it does not fill my stomach but when I eat couscous it does so.** However, it was found that most consume liquid during meals while food is still in

their mouths to ease the intake of solids as it helps to swallow food fast and reduce the sensation of breathlessness and suffocation. This is evident in the speech of the respondents, They also reported that (...) **every time I eat I drink something as well, I think it helps a lot to swallow the food, because if I do not drink juice or something I feel as if I am choking, that bad feeling of being unable to breathe.**

This result is in line with other research that indicates that individuals with oral breathing and they agree that when these individuals need to eat a more solid diet it is accompanied by plenty of fluids, in order to help in swallowing food and to decrease the feeling of suffocation<sup>5,6,13,17</sup>. It is observed that in the absence of food option that facilitates coordination between breath / deglutition they tend to maintain the consistency of the diet as it is offered.

Regarding to the results of this research on the relationship between school food and home food, it was found that the school feeding habits coincide with the feeding home food preference. When the respondents were asked if they would eat at home the same kind of food offered at school, the answer was yes and confirmed that it is the same kind of food offered at home, **" Sometimes I eat school food ... It can be an option of home food, because what I eat here is what I eat at home!** It appears that the school lunch does not favor the coordination between breathing and swallowing due to the predominance of a solid consistency.

## CONCLUSION

From the findings of this study, it can be noticed that the preferred type of food consistency by the respondents in this age group were solid, such as rice, beans, pasta and meat, regardless of the breathing mode. However, it was found that most respondents take liquid during meals, while food is still in their mouth as it aids in swallowing solids.

The food offered by the school corresponds to the preferred consistency by mouth breathing individual, however, they are food that does not ease the adequacy of breathing mode as incoordination breathing / swallowing exists.

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