

Original research article

# Evaluation of orofacial dysfunctions and oral health-related quality of life in children with asthma

Buket Ceylan Çalık Yılmaz , Alev Alaçam \*Department of Pediatric Dentistry, Faculty of Dentistry,  
Gazi University, Ankara, Turkey

CONFLICT OF INTEREST: The authors declare no conflict of interest related to this study.

## ABSTRACT

**OBJECTIVE:** This study aimed to investigate the impact of asthma on oro-facial muscle dysfunction (OFD) and oral health-related quality of life (OHRQoL) in children.

**MATERIALS AND METHOD:** A total of 158 children, 79 diagnosed with asthma and 79 healthy, were included in the study. Children diagnosed with asthma were divided into controlled and uncontrolled asthma groups. The OFD and OHRQoL of all participants were evaluated with Nordic Orofacial Test and Screening (NOT-S) and Child Perception Questionnaire (CPQ<sub>8-10</sub>). The differences and correlations between the groups were statistically evaluated (Mann-Whitney and Spearman and Chi-Square test).

**RESULTS:** NOT-S interview, examination, and total scores were statistically higher in the asthma group compared to healthy children and between uncontrolled and controlled asthma groups ( $p < 0.001$ ). Higher scores were obtained in all areas of CPQ<sub>8-10</sub> in the asthma group ( $p < 0.001$ ). NOT-S and CPQ<sub>8-10</sub> scores elevated compatibly in the groups diagnosed with asthma.

**CONCLUSION:** OFD in asthmatic children predicts worse OHRQoL.

**KEYWORDS:** Asthma; child; orofacial dysfunction; quality of life

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## INTRODUCTION

Asthma is a heterogeneous disease usually characterized by chronic airway inflammation, affecting 1-18% population in different countries.<sup>1</sup> According to the results of regional prevalence studies in Turkey, the prevalence of asthma shows a distribution between 2-16% in children and has been increasing in recent years.<sup>2-5</sup> As a consequence of inflammatory response and increased airway resistance in the respiratory system, the subjects suffering from asthma, experience difficulty in breathing. To overcome this difficulty, their mode of breathing changes from nasal to oral breathing.<sup>6</sup> This change in function can trigger modulations in the craniofacial growth patterns.<sup>7-8</sup> There are studies evaluating the speech, muscle function, and facial asymmetry of children with asthma.<sup>9-10</sup>

NOT-S (Nordic Oro-facial Test and Screening) is a comprehensive screening instrument for the evaluation of oro-facial dysfunctions (OFD).<sup>11</sup> It has been used for the investigation of OFD in patients with ectodermal dysplasia,<sup>12</sup> adenotonsillar hypertrophy,<sup>13</sup> Parkinson's disease,<sup>14</sup> Prader-Willi syndrome,<sup>15</sup> oro-mandibular dystonia,<sup>16</sup> Treacher Collins syndrome,<sup>17</sup> amyotrophic lateral sclerosis<sup>18</sup>, and cerebral palsy.<sup>19</sup> The form can be downloaded from [www.mun-h-center.se](http://www.mun-h-center.se) in English and several other languages.<sup>20</sup>

The study of Leme *et al.*<sup>21</sup> pointed out that, in healthy children, the presence of OFD was associated with worse OHRQoL and subsequently undermined the requirements for social interactions, including speech, emotional communication, facial expression, and appearance. OHRQoL measures provide important information when assessing the need for treatment of individuals and communities, making clinical decisions, and evaluating an intervention, service, and treatment programs. Child Perception Questionnaire (CPQ) is an evaluation method that shows the effect of oral health on physical and psychosocial functionality.<sup>22-23</sup>

Considering the high prevalence of malocclusions among children with asthma and its relation with possi-

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\*Corresponding author: Dr. Alev Alaçam, Gazi University Faculty of Dentistry  
Department of Paediatric Dentistry, 06510, Emek, Ankara, Turkey;  
E-mail: [alacam@gazi.edu.tr](mailto:alacam@gazi.edu.tr)

ble future disorders, it could be valuable to evaluate the OFD of these patients as well as their correlations with oral health-related quality of life (OHRQoL). Thus, the present study aimed to evaluate the impact of asthma on OFD and OHRQoL in children.

## MATERIALS AND METHOD

Ethical approval was obtained from the Ethics Committee of the Gazi University (protocol no 06.11.2018/09). Participants and their parents were informed about the examination procedures and assured of the confidentiality of the collected information. Only those who signed the informed consent form were included in the study. The presence of orofacial dysfunction was evaluated using the Turkish version of NOT-S.<sup>20</sup> OHRQoL was evaluated using the Turkish version of the Child Perception Questionnaire (CPQ<sub>8-10</sub>).<sup>24</sup>

According to the power analysis, 79 asthmatics (45 boys and 34 girls) and 79 healthy children (45 boys and 34 girls) consisting of both genders in the age range of 8-10, who referred to Gazi University Faculty of Dentistry Department of Pediatric Dentistry Clinic were included to the study. Patients who were diagnosed with asthma according to international guidelines and followed up for at least one year regularly were included in the study group. The asthma patients were divided into controlled and uncontrolled sub-groups according to the Global Initiative for Asthma (GINA) lit.<sup>1</sup> If the patient had none of the symptoms of daytime asthma symptoms more than twice /week, any night waking due to asthma, any activity limitation due to asthma, short-acting beta2-antagonist (SABA) reliever more than twice a week, and any activity limitation due to asthma in the past 4 weeks, they were included in the controlled group. Children who had 3-4 symptoms were taken in the uncontrolled group.

The healthy children group was randomly selected from the patients who were referred to the dental clinic for dental treatment and who accepted to participate in the study. Patients with cleft lip, syndromes, chronic systemic diseases other than asthma, and children who refused to participate in the study and had difficulty in reading or speaking Turkish were excluded from the study.

NOT-S protocol consists of a structured interview and a clinical examination, including six domains in each part. Each domain consists of questions or tasks, which are termed items. Each item serves to discriminate between normal function and dysfunction. The domains and items are scored last. The NOT-S interview was held by asking the questions printed on the screening form.

The subjects were requested to carry out tasks for each item in conjunction with the illustrated manual to assess OFD in the clinical examination. The examination contains six domains and each domain comprises one to five items. Each item has criteria for the respective function. An answer of YES or a task that met the

criteria for impaired function resulted in a score of 1, indicating a dysfunction in the scored domain. An answer of NO or a task that did not meet the criteria resulted in a score of 0 (zero). The total score was the sum of the score for each domain, ranging from 0 to 12. Higher score means worse OFD. In this study, the question about snoring in the breathing domain was removed as suggested in the original text.

The impact of oral conditions on OHRQoL of the asthmatic and healthy children was evaluated using the CPQ<sub>8-10</sub>. It is a self-completed questionnaire with 25 items grouped into four domains: oral symptoms, functional limitations, emotional well-being, and social well-being. A Likert-type scale was used with the response options of "Never" = 0, "Once or twice" = 1, "Sometimes" = 2, "Often" = 3, and "Every day" = 4. The minimum and maximum scores are 0 and 100, respectively. A high score indicates more negative impacts on the OHRQoL. Overall or global assessments of participants' Oral Health (OH) and which oral or oro-facial condition affected their Overall Well-Being (OWB) were asked. OH and OWB questions are worded as follows: "When you think about your teeth or mouth, would you say that they are..." and "How much do your teeth or mouth bother you in your everyday life?" These global ratings had a 4-point response scale ranging from "Very good" = 0 to "Poor" = 3 for OH, and from "Not at all" = 0 to "A lot" = 3 for OWB, respectively.

## Statistical analysis

Data were analyzed using IBM SPSS Statistics 17.0 (IBM Corporation, Armonk, NY, USA). The descriptive statistics were expressed as mean  $\pm$  standard deviation, categorical variables as the number of cases, and (%). The Mann-Whitney U test was used to examine whether the NOT-S screening test between the control and asthma groups was statistically significant in terms of subscale and total scores.

Categorical variables were examined using Continuity Correction Chi-Square or Fisher's exact result probability test when the expected frequency was between 5-25, and otherwise, "Pearson Examination" was done by chi-square test of flour. Spearman's rank correlation test was used to examine whether there was a statistically significant correlation between the NOT-S subscale and total scale score and the CPQ8-10 subscale and total scale score among the groups. The level of significance was set at  $p < 0.05$ .

## RESULTS

A total of 158 children, whose mean age was  $9.06 \pm 0.76$  years in the healthy group and  $9.08 \pm 0.76$  in the asthma group, were included in the study. There was no significant difference between healthy children and asthma groups in terms of sex and age parameters according to Mann Whitney U test ( $p > 0.05$ ). In the asthma group, 16.5 % of the participants were diagnosed with uncontrolled asthma and 83.5 % of them had controlled asthma.

**Table 1.** NOT-S total, interview, and examination scores according to groups

	Healthy children (n=79)	Asthmatic children (n=79)	p value§	Uncontrolled asthma (n=13)	Controlled asthma (n=66)	p value§
<b>Total</b>	0.47±0.62 0 (0-2)	1.91±1.63 1 (0-7)	<0.001	4.8±1.2 5 (3-7)	1.4±1.0 1 (0-4)	<0.001
<b>Interview</b>	0.47±0.62 0 (0-2)	1.44±1.12 1 (0-5)	<0.001	3.3±0.8 3 (2-5)	1.1±0.7 1 (0-3)	<0.001
<b>Examination</b>	0.00±0.00 0 (0-0)	0.47±0.69 0 (0-2)	<0.001	1.5±0.5 1 (1-2)	0.3±0.5 0 (0-2)	<0.001

§Mann-Whitney test

**Table 2.** Distribution of NOT-S domain and answered items according to groups

	Healthy children; n=79	Asthmatic children; n=79	p value§	Uncontrolled asthma; n=13	Controlled asthma; n=66	p value§
<b>INTERVIEW</b>						
<b>(I) Sensory function</b>						
<b>A. Does brushing your teeth elicit a gag reflex?</b>	7 (8.9%)	24(30.4%)	<b>&lt;0.001</b>			
<b>B. Do you put so much food in your mouth that it becomes difficult to chew?</b>	7 (8.9%)	15 (19.0%)	0.108	4 (30.8%)	11 (16.7%)	0.256
<b>(II) Breathing</b>	0 (0.0%)	9 (11.4%)	0.003	5(38.5%)	4 (6.1%)	<b>0.005</b>
<b>(III) Habits</b>	OMITTED					
<b>A. Do you bite you nails, or suck your fingers, or other objects every day?</b>	20 (25.3%)	23 (29.1%)	0.721			
<b>(IV) Chewing and swallowing</b>	19 (24.1%)	22 (27.8%)	0.717	2 (15.4%)	20 (30.3%)	0.334
<b>B. Do you find it difficult to eat foods with certain consistencies?</b>	9 (11.4%)	38 (48.1%)	<b>&lt;0.001</b>			
<b>C. Does it take you 30 min or more to eat a main meal?</b>	6 (7.6%) <sup>2</sup>	21 (26.6%)	<b>0.003</b>	10 (76.9%)	11 (16.7%)	<b>&lt;0.001</b>
<b>D. Do you swallow large bites without chewing?</b>	2 (2.5%)	15 (19.0%)	<b>0.002</b>	7 (53.8%)	8 (12.1%)	<b>0.002</b>
<b>E. Do you often cough during meals?</b>	1 (1.3%)	7 (8.9%)	0.063	2 (15.4%)	5 (7.6%)	0.324
<b>(V) Drooling</b>	0 (0.0%)	14 (17.7%)	<b>&lt;0.001</b>	6 (46.2%)	8 (12.1%)	<b>0.009</b>
<b>(VI) Dryness of the mouth</b>	0 (0.0%)	0 (0.0%)	-			
<b>A. Do you have to drink to be able to eat a cracker?</b>	1 (1.3%)	11 (13.9%)	0.007	8 (61.5%)	3 (4.5%)	<b>&lt;0.001</b>
<b>EXAMINATION</b>						
<b>(1) Face at rest</b>	0 (0.0%)	14 (17.7%)	<b>&lt;0.001</b>			
<b>B. Deviant lip position</b>	0 (0.0%)	14 (17.7%)	<b>&lt;0.001</b>	7 (53.8%)	7(10.6%)	<b>&lt;0.001</b>
<b>(2) Nose breathing</b>	0 (0.0%)	7 (8.9%)	<b>0.014</b>			
<b>A. Close your mouth and take 5 deep breaths through your nose</b>	0 (0.0%)	7 (8.9%)	<b>0.014</b>	3(23.1%)	4(6.1%)	0.083
<b>(3) Facial expression</b>	0 (0.0%)	0 (0.0%)	-	0 (0.0%)	0 (0.0%)	-
<b>(4) Masticatory muscles and jaw function</b>	0 (0.0%)	0 (0.0%)	-	0 (0.0%)	0 (0.0%)	-
<b>(5) Oral motor function</b>	0 (0.0%)	0 (0.0%)	-	0 (0.0%)	0 (0.0%)	-
<b>(6) Speech</b>	0 (%0.0)	16 (20.3%)	<b>&lt;0.001</b>			
<b>B. Count out loud to ten</b>	0 (%0.0)	16 (20.3%)	<b>&lt;0.001</b>	9 (69.2%)	7 (10.6)	<b>&lt;0.001</b>

§Chi-square test, Fisher's exact result probability test

**Table 3.** CPQ<sub>8-10</sub> total and subscale scores in all groups (mean±SD)

	Healthy children (n=79)	Asthmatic children n=79)	p value§	Uncontrolled asthma (n=13)	Controlled asthma (n=66)	p value§
<b>Oral symptoms (0-20)</b>	6.6±3.8 6 (0-15)	10.8±3.8 11 (2-19)	<0.001	14.9±2.7 15 (11-19)	10.0±3.4 10 (2-18)	<0.001
<b>Functional limitations (0-20)</b>	3.4±3.7 2 (0-13)	7.1±4.5 6 (0-18)	<0.001	13.0±2.8 13 (9-18)	5.9±3.8 6 (0-14)	<0.001
<b>Emotional well-being (0-20)</b>	3.7±3.8 3 (0-16)	6.4±5.3 6 (0-20)	<0.001	13.3±4.2 12 (6-20)	5.1±4.4 4,5 (0-20)	<0.001
<b>Social well-being (0-40)</b>	4.1±5.1 2 (0-24)	8.7±7.7 7 (0-32)	<0.001	20.2±6.6 20 (7-32)	6.4±5.6 5 (0-19)	<0.001
<b>Total scale (0-100)</b>	17.8±13.3 15 (0-61)	33.0±18.2 29 (2-84)	<0.001	61.4±12.7 57 (38-84)	27.4±13.2 25.5 (2-59)	<0.001

§Mann Whitney U test

**NOT-S interview**

Total, interview, and examination scores of NOT-S in the asthma group were found statistically higher than the healthy group ( $p < 0.001$ ). Also, there was a difference between uncontrolled and controlled asthma groups ( $p < 0.001$ ; Table 1). The distribution of NOT-S domains and answered items are given in Table 2.

In the asthma group, the highest OFD prevalence was found in the domain “Sensory function” as well as “Chewing and swallowing” showing a statistical difference from the healthy group in the NOT-S interview ( $p < 0.001$ ). In the “Sensory function” domain, the item “Do you put so much food in your mouth that it becomes difficult to chew?” showed a statistical difference in the uncontrolled group than the controlled asthma group ( $p < 0.005$ ). Although there was no significant difference between asthma and healthy children groups in the item “Does brushing your teeth elicit a gag reflex?”, there was a vomiting reflex in 19% of the asthmatic group while brushing their teeth.

When the items of NOT-S interview were examined, the item “Do you often cough during meals?” of “Chewing and swallowing” domain was found to be statistically different in the asthma group ( $p < 0.001$ ). The items “Do you find it difficult to eat foods with certain consistencies?” ( $p < 0.001$ ) and “Does it take 30 minutes or more to eat a main meal?” ( $p < 0.005$ ) in this domain were also found to be statistically different in the uncontrolled asthma group. The item “Do you have to drink to be able to eat a cracker?” in “Dryness of the mouth” domain was also important for the uncontrolled asthma group ( $p < 0.001$ ). There was no statistical difference for “Habits” ( $p > 0.05$ ) and no dysfunction was reported in the “Drooling” domain.

**NOT-S examination**

In the examination part, the asthma group displayed differences in “Face at rest” ( $p < 0.001$ ), “Nose breathing”

( $p < 0.05$ ), and “Speech” ( $p < 0.001$ ) domains compared to the healthy children group (Table 2). The Asthma group had high scores in the domain “Speech”, “Count to ten out loud” item. Nose speech was detected in 69.2% of the children in uncontrolled and 10.6% of controlled asthma groups. All the asthmatic children who showed dysfunction in the “Face at rest” domain had high scores in the “Deviant lip position” item ( $p < 0.001$ ). The uncontrolled asthma group showed higher dysfunction scores than the controlled asthma group at “Count to ten out loud” and “Deviant lip position” items with a statistical difference ( $p < 0.001$ ). There were no dysfunctions in the 3rd, 4th, and 5th domains in asthmatic and healthy children groups.

**OHRQoL evaluation with CPQ<sub>8-10</sub>**

Oral symptoms, functional limitations, emotional well-being and social well-being subscale, and CPQ<sub>8-10</sub> total scale scores were also statistically important in the asthma group ( $p < 0.001$ ). The highest score was in oral symptoms and the lowest was in the emotional well-being in this group. In the healthy control group, the highest score was in oral symptoms and the lowest score was in functional limitations. In the uncontrolled asthma group, oral symptoms, functional limitations, emotional well-being and social well-being subscale, and CPQ<sub>8-10</sub> total scale scores were statistically higher than in the controlled asthma group ( $p < 0.001$ ). The highest score was in the social well-being item in the uncontrolled asthma group whereas oral symptoms had the highest score in the controlled asthma group (Table 3).

According to “Pearson Examination” by chi-square test, the frequency distribution of the children in terms of oral health and overall well-being showed that children with asthma who answered the oral health questions as poor were high and the result was statistically important ( $p < 0.001$ ). In the healthy children group, participants stated their oral health as 48.1% normal and 22.8% good. Also, the OWB question “How much do

**Table 4.** Spearman’s rank correlation test between overall and subscale scores for healthy and asthmatic children determined by NOT-S and CPQ8-10

	Healthy children			Asthmatic children		
	Interview	Examination	Total	Interview	Examination	Total
<b>Oral symptoms</b>						
Coefficient of correlation	0.295	-	0.295	0.671	0.511	0.677
p value	0.008	-	0.008	<0.001	<0.001	<0.001
<b>Functional limitations</b>						
Coefficient of correlation	0.362	-	0.362	0.697	0.602	0.735
p value	<0.001	-	<0.001	<0.001	<0.001	<0.001
<b>Emotional well-being</b>						
Coefficient of correlation	0.201	-	0.201	0.668	0.682	0.749
p value	0.076	-	0.076	<0.001	<0.001	<0.001
<b>Social well-being</b>						
Coefficient of correlation	0.315	-	0.315	0.674	0.591	0.699
p value	0.005	-	0.005	<0.001	<0.001	<0.001
<b>CPQ<sub>8-10</sub> total</b>						
Coefficient of correlation	0.321	-	0.321	0.816	0.680	0.851
p value	0.004	-	0.004	<0.001	<0.001	<0.001

your teeth or mouth bother you in your everyday life?" answered "not at all" 6.4% in the asthma group and 39.2% in the healthy children group ( $p < 0.001$ ). The answer to the question "When you think about your teeth or mouth, would you say that they are...." was normal (43.6%) in the asthma group and the result was important compared to healthy children ( $p < 0.001$ ). There was a correlation between the increase of NOT-S interview, examination, and total scores and the CPQ<sub>8-10</sub> subscale and total scale scores ( $p < 0.001$ ; Table 4).

## DISCUSSION

Early diagnosis and assessing symptom control are very important in asthmatic children.<sup>1</sup> Studies evaluating the speech, muscle function, and facial asymmetry of children with asthma showed the extent of dysfunctions that may affect the illness negatively during growth and development time course.<sup>9-10</sup>

The sex and age range of this study was parallel with the epidemiological studies on asthmatic children in Turkey.<sup>5,25</sup> The reason for the inclusion of children aged 8-10 in this study is that the children can answer the evaluation scales on their own without help from their parents.

In the international asthma diagnosis and treatment guidelines "Global Strategy for Asthma Management and Prevention (GINA)", asthma is categorized by taking into account the severity of asthma, clinical characteristics, respiratory functions, and the treatment the patient is receiving.<sup>1</sup> In this study, the participants were evaluated in controlled and uncontrolled asthma groups by the GINA assessment.<sup>1</sup> In this study, 83.5% of the asthma patients were in the controlled group.

In the "Sensory function" area of the NOT-S interview, 30.4% of the asthmatic group had a statistically significant dysfunction ( $p < 0,001$ ). This result also supported the findings of Amato *et al.*<sup>28</sup> In this domain, there was a vomiting reflex in 19% of the asthmatic group while brushing their teeth. Although there was no significant difference between asthma and healthy children groups in this item, some researchers predict that progressed sensitivity and vomiting reflex in the mouth could be developed with the use of inhaled drugs.<sup>26,27</sup> The highest OFD prevalence (48.1%) was found in the asthma group in the domain "Chewing and swallowing" compared to healthy children ( $p < 0.001$ ). Most of the children were found to have difficulty in eating foods with certain consistencies and they reported that they often cough during meals as well as having long mealtimes of more than 30 minutes in the asthma group ( $p < 0.001$ ). Difficulties in eating foods with certain consistencies and longer mealtimes affected the uncontrolled asthma group more than the controlled ones. This result supported the opinion of da Cunha *et al.*<sup>28</sup> They stated that the respiratory distress experienced due to the inability to achieve the necessary balance for breathing during feeding may be related to the decrease in chewing time of asthmatic patients. Decreased sensitivity in the oral

cavity of asthmatic children was compatible with the results of the above studies.<sup>28,29</sup> "Do you have to drink to be able to eat a cracker" item of the "Dry mouth" domain was observed to have a statistical significance in the uncontrolled asthma group ( $p < 0.001$ ). Studies were reporting that these findings may be the result of the use of inhalers in the treatment of asthma and that asthma patients have difficulty in chewing functions due to dry mouth and loss of taste.<sup>29,30</sup> On the other hand, it should not be ignored that mouth breathing is also one of the causes of dry mouth.

In the domain "Face at rest", "Deviant lip position" item of the NOT-S clinical examination, this dysfunction was statistically significant ( $p < 0.001$ ) in the asthma group as well as in the uncontrolled asthma group ( $p < 0.001$ ). This finding was consistent with the studies of Faria *et al.*<sup>10</sup> and Goldberg<sup>30</sup> who stated that high oro-facial differences and malocclusion incidence in asthmatic children may be related to inadequate lip closure.

Researchers also stated that mouth-breathing and inadequate lip closure may result in a narrower upper jaw inter-molar distance and a higher palate depth in asthmatic children.<sup>31-35</sup> The frequency of mouth breathing was found to be higher in asthma patients compared to the healthy group in many studies.<sup>10,33,34</sup> Dysfunction in the "Nose breathing" domain of this study also supported the results of the above studies.

Strom and Silverberg<sup>36</sup> found that childhood with asthma, hay fever, and food allergy were associated with an increased risk of speech disorder. In this study, all the asthmatic children who had dysfunction in the "Count to ten out loud" item of the "Speech" domain, were found to talk through the nose. This finding was compatible with the results of Castro *et al.*<sup>7</sup>, Strom and Silverberg,<sup>36</sup> Campanha *et al.*<sup>37</sup>, and Carvalho-Oliveira *et al.*<sup>38</sup>

In the NOT-S screening test, it was observed that both interview and clinical examination scores were higher in the asthma group compared to the healthy control group. This proves that the clinical findings of oro-facial dysfunctions can be monitored, and they have an effect on the quality of life. Studies using Child Perception Questionnaire (CPQ<sub>8-10</sub>) in healthy children showed that the presence of oro-facial dysfunction negatively affects OHRQoL.<sup>21,39</sup> Jokovic *et al.*<sup>22</sup> reported that healthy children with oro-facial problems got the highest score in all parts of the scale of CPQ<sub>11-14</sub>.

In the present study, significantly higher scores were recorded in the areas of oral symptoms, functional limitations, emotional well-being, and social well-being in the asthma group compared to the healthy control group. While the highest average score in both groups was observed in the field of oral symptoms, the lowest score was recorded in the field of emotional well-being in the asthma group and the functional limitations in the healthy control group. The questions in the social well-being area of the CPQ<sub>8-10</sub> scale were related to the communication with other people and the activities

in which the children participate with their peers. The highest score in the uncontrolled asthma group was in the social well-being section can be explained by the avoidance of sports activities and crowded environments of this group of children. On the other hand, the frequency distribution of the participants in terms of oral health and overall well-being showed that the asthma group thought that they had poor oral health and they were uncomfortable about it.

Rank correlations between overall and subscale scores of NOT-S and CPQ<sub>8-10</sub> for healthy control and asthma groups also showed that when clinical examination and total scores of the asthmatic group increased in the NOT-S interview, there was a statistically significant increase in the CPQ<sub>8-10</sub> subscale and total scores, indicating that OFD in asthma negatively affects the OHRQoL in children.

The strength of this study is the standardized and proven valid and reliable screening scales applied by a single researcher. On the other hand, the fact that children with asthma who were referred to our clinic for dental treatment may not represent the general asthmatic population and the adenoid and tonsil size of the participants were not evaluated by the otolaryngologist are the factors limiting the study.

## CONCLUSION

OFD was statistically higher in the asthma group and this result was correlated with high scores in the areas of oral symptoms, functional limitations, emotional well-being, and social well-being of OHRQoL, pointing out the impact of asthma on OFD and OHRQoL.

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## Astımlı çocuklarda orofasiyal disfonksiyonların ve ağız sağlığına bağlı yaşam kalitesinin değerlendirilmesi

### ÖZET

**AMAÇ:** Bu çalışmada, astımın çocuklarda ağız-yüz kas disfonksiyonu (OFD) ve ağız sağlığı ile ilişkili yaşam kalitesi (OHRQoL) üzerindeki etkisinin araştırılması amaçlandı.

**GEREÇ VE YÖNTEM:** Çalışmaya 79'u astım tanısı almış, 79'u sağlıklı olmak üzere toplam 158 çocuk dahil edildi. Astım tanısı konan çocuklar kontrollü ve kontrolsüz astım gruplarına ayrıldı. Tüm katılımcıların OFD ve OHRQoL'leri Nordik Orofasial Tarama Testi (NOT-S) ve Çocuk Algı Anketi (CPQ<sub>8-10</sub>) ile değerlendirildi. Gruplar arasındaki farklar ve korelasyonlar istatistiksel olarak değerlendirildi (Mann-Whitney ve Spearman ve Ki-Kare testi)

**BULGULAR:** NOT-S görüşme, muayene ve toplam puanları astım grubunda sağlıklı çocuklara göre ve kontrolsüz ve kontrollü astım grupları arasında istatistiksel olarak daha yüksek bulundu ( $p<0.001$ ). Astım grubunda CPQ<sub>8-10</sub>'un tüm alanlarında daha yüksek puanlar elde edildi ( $p<0.001$ ). NOT-S ve CPQ<sub>8-10</sub> skorları astım tanısı alan gruplarda uyumlu olarak yükseldi.

**SONUÇ:** Astımlı çocuklarda OFD'nin OHRQoL'yi olumsuz yönde etkilediği görüldü.

**ANAHTAR KELİMELEER:** Astım; çocuk; orofasiyal disfonksiyon; yaşam kalitesi