Original Article

Evaluation of the Oral Health-Related Quality of Life in Asthmatic Children in year 2012-2013

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Abstract

Background and Aim: The present study investigates the oral health-related quality of life in asthmatic children aged 8-14 years old in Sari city.

Materials and Methods: In this case control study, the DMFT and oral health-related quality of life of 56 children aged 8-14 years were investigated (n=28 for each group). The asthma grade of each patient, the duration of asthma, the type of corticosteroid used, and the smoking habits of the parents were recorded in the individual's questionnaire after interviewing and obtaining the relevant information. Children were examined and their dmft/DMFT ratio was recorded. Statistical tests such as Chi-square, Mann-Whitney U, Kruskal-Wallis, and Spearman's correlation were used.

Results: The results showed that the quality of life in asthmatic children was significantly lower than in the control group, and the dmft/DMFT ratio was higher (P<0.001). Additionally, a reduction in quality of life and an increase in the dmft/DMFT ratio were significantly associated with increased asthma severity. There were no significant differences in quality of life and the dmft/DMFT ratio between children with smoker and non-smoker parents (P=0.852 and P=0.887, respectively). Overall, there was a negative correlation between oral health-related quality of life and the dmft/DMFT ratio (0.76).

Conclusion: The oral health-related quality of life and the dmft/DMFT ratio in children with asthma are suboptimal. Additionally, having smoker parents does not affect the quality of life and history of tooth decay in these children.

Key Words: Asthma, Child, DMFT, Oral health-related quality of life, Quality of life

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Introduction

Health is not merely the absence of disease or disability. In a broader sense, it encompasses physical, mental, spiritual, social, and cultural well-being. From a scientific perspective, the ability to function properly is also integral to the concept of health. (1, 2). In contemporary dentistry, attention is not only given to the physical and pathological aspects of diseases and oral hygiene but also to the socio-economic and psychological consequences, patient satisfaction, and the oral and dental health-related quality of life (3). The concept of Oral Health-Related Quality of Life (OHRQoL), introduced as a multi-dimensional construct encompassing physical, social, and psychological dimensions, has gained increasing significance (4). This concept indicates how much a person is satisfied with his or her mouth and teeth status and how much his or her performance has been affected by this condition (5).OHRQoL is crucial in children since oral and dental diseases are very common in children and the problems caused by such diseases, especially tooth pain or appearance problems, negatively affect their current and future quality of life, and can affect their daily activities, such as playing, sleeping, feeding, social participation, and education (6, 7).

Asthma is the most common chronic disease in children and adults. It is defined as a chronic inflammatory disease of the airways associated with increased responsiveness to various bronchial stimuli (8). It can not only lead to impaired lung function in patients who are not adequately treated but also reduce their quality of life (9).

Both asthma children and their families are at risk of impaired psychological functioning, well-being, and quality of life (QoL) (2, 3). Thus, assessing health-related quality of life in children with asthma is more than a mere assessment of their real status and healthcare needs since it helps to assess the effectiveness of clinical interventions (3). Several studies have assessed the health-related quality of life of children with asthma using various tools and questionnaires (9, 10). Also, many studies have investigated oral health, oral variables, gum health, gum bleeding, gingivitis, periodontal diseases, and dental decay indices such as DMFT in these children (11-14). However, very few studies are available regarding the OHRQoL of these children. Given the significance of the oral and dental health of asthma patients and its higher significance in children, this study investigates the oral health-related quality of life of 8- to 14-year-old asthma children in Sari city.

Materials and Methods

This case-control study was conducted after receiving ethical approval from the Ethics Committee of Mazandaran University of Medical Sciences. (IR.MAZUMS.REC.1401.429)

In this case-control study, 56 children aged 8-14 years were investigated, with 28 children in both the case and control groups Necessary explanations were first given to the participants and their parents. The parents of each participant were asked to complete the informed consent form before entering the study. The questionnaire was designed based on Hadzipasic's study (15). In this study, the available Persian version, whose validity and reliability have been confirmed, was used. (16, 17). The questionnaire included 25 questions. The participants were asked to describe their experiences during the past month through questionnaire questions, after completing the personal information section. These questionnaires included queries that evaluate the negative impacts of various oral conditions on the child's QoL and the quality of life in four areas, including “oral symptoms”, “functional impairment”, “emotional health” and “psychosocial health”. Each question had 5 choices. Answers were scored from 0 to 4 (0: never), (1: once or twice), (2: sometimes), (3: most of the time), and (4: every day). The CPQ score was obtained by summing questionnaire answers. A higher score indicated a higher degree of impact of oral conditions on the quality of life.

Statistical population and sample size calculation

In this case-control study, the subjects were selected from 8- to 14-year-old children referred to the medical center of Mazandaran University of Medical Sciences in 2012-2013 using a convenience sampling approach.

The sample size was calculated considering a significance level (α) of 5%, a test power (1-β) of 80%, and using the following formula, resulting in 28 samples for each group (56 samples in total)

$$n = \frac{(z_{1-\alpha/2} + z_{1-\beta})^2 * ({\sigma_1}^2 + {\sigma_2}^2)}{(\mu_1 - \mu_2)^2}$$

The case group included 8- to 14-year-old children with medical confirmation of asthma in the medical record. The control group included 8- to 14-year-old children who had no systemic disease (healthy). Children who did not cooperate in answering the questionnaire and children with mental or physical retardation were excluded from the study. Incomplete questionnaires were also excluded from the study.

To evaluate the severity of asthma based on the history and examination by a pediatric lung specialist, the following classification was used. (13):

1. Occasionally/mild: when exacerbations are rare (less than 1 time per month), symptoms are uncommon at night (less than 2 times per month) and only intermittent use of β2-mimetics is necessary.
2. Moderate: when exacerbations are more frequent (2-3 times per month), symptoms are more frequent at night (more than 2 times per month), β2-mimetics are required almost daily and low daily doses of inhaled corticosteroids are prescribed (less than 400 µg/ day)
3. Severe/very severe: when exacerbations appear weekly, symptoms occur every day (often at night), physical activity is limited, and higher doses of inhaled corticosteroids are required (severe asthma, more than 400 µg/day, and very severe asthma, more than 1400 mcg/day) or when oral corticosteroids are necessary.

The asthma grade of each patient, the duration of asthma, the type of corticosteroid used, and the smoking habits of the patient's parents were recorded for statistical analysis after interviewing and obtaining the mentioned information.

After completing the questionnaire, they were examined in a dental unit under favourable conditions and light by a pediatric dental specialist using a probe and a mirror, and their DMFT (depending on whether they have deciduous or permanent teeth) was recorded. Then, the resulting number was divided by all the teeth in the mouth and the dmft/DMFT ratio was expressed as a percentage.

Statistical analysis

The data were described using frequency, percentage, mean, and standard deviation. The normal distribution assumption was tested using the Shapiro–Wilk test. The results showed that the data lacked normal distribution, therefore non-parametric tests were used. Chi-square tests were used to compare the frequencies of two qualitative variables, while Mann-Whitney tests compared scores between two groups, and Kruskal-Wallis tests compared scores among more than two groups. Spearman's correlation coefficient was employed to examine the relationship between quantitative variables. A significance level of less than 5% was considered, and the analysis was conducted using SPSS 22 software.

Results

In the present study, children aged 8 to 14 years were included, with 32.1% being 8 years old, 41.1% being 9 years old, and 26.8% being 10 years and older.Among all participants, 53.6% of were female and 46.4% were male subjects. According to the statistics, 67.9% of the participants' parents were non-smokers. Among the asthma patients, the majority had Grade 2 asthma (42.9%), while Grade 3 asthma was the least prevalent (17.9%).

In the case group, the highest prevalence of asthma was observed in those with one-year and two-year involvement (32.1% each) while the lowest prevalence was in 5-year involvement (7.2%). In this study, all participants with asthma were taking corticosteroids. In the case group, the number of male and female participants was equal.

However, in the healthy group, most of the children were male. In both groups, most parents did not smoke. There was no significant difference between two groups regarding age, gender, and smoking of the parents, two groups were homogeneous in this regard (Table1).

Table 1. Comparison of frequency of variables in two groups

Variable		Patient N (%)	Healthy N (%)	p-value
Age	8 years old	12 (42.9)	6 (21.4)	0.243
	9 years old	10 (35.7)	13 (46.5)	
	10 years old	6 (21.4)	9 (32.1)	
gender	male	14 (50.0)	16 (57.1)	0.789
	female	14 (50.0)	12 (42.9)	
Smoker parents	No	18 (64.3)	20 (71.4)	0.775
	Yes	10 (35.7)	8 (28.6)	

The mean quality of life score of the participants was 30.48±7.62 and the mean dmft/DMFT ratio of these children was 10.85±9.61. Quality of life and the dmft/DMFT ratio were significantly different between the two groups (P<0.001) and the status of both indices was more unfavorable in the patient group (Chart 1).

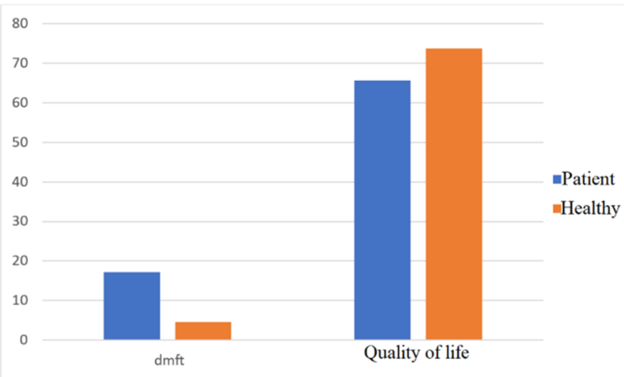

Chart 1. Comparison of quality of life and the dmft/DMFT ratio in two patient and healthy groups

Table 2 presents the descriptive information on the quality of life and the dmft/DMFT ratio according to the asthma grade in the patient group. As seen, there is a significant difference between the three grades regarding the quality of life and the dmft/DMFT ratio (P<0.001) and the status of both indices is more unfavorable in children with grade 3 asthma. The Spearman's correlation between the dmft/DMFT ratio index and quality of life to grade asthma were 0.91 (p-value<0.001) and -0.93 (p-value<0.001), respectively.

The level of quality of life and the dmft/DMFT ratio were not significantly different in the two groups of smoker and non-smoker parents (P=0.852 and P=0.887, respectively). Table 3 presents the descriptive information on the quality of life and the dmft/DMFT ratio in two groups of smoker and non-smoker parents. As seen, the level of quality of life and the dmft/DMFT ratio is not significantly different in the two groups regarding smoker and non-smoker parents.

The correlation between the dmft/DMFT ratio index and quality of life was -0.76. There is a significant and inverse correlation between the two indices (P<0.001), so the quality-of-life score decreases as the dmft/DMFT ratio index increases.

Table 4 shows the descriptive information on the quality of life and the dmft/DMFT ratio of asthmatic patients separately based on the duration of asthma. Accordingly, the score of quality of life and the dmft/DMFT ratio have a significant relationship with the duration of asthma, so the dmft/DMFT ratio index increases, and the quality of life decrease since the duration of asthma increases.

Discussion

Asthma, as a chronic disease of the airways, has an increasing prevalence worldwide. It significantly affects the quality of life, so it should be considered seriously (18, 19). Oral health is an integral part of a child's overall health and can be affected by chronic diseases such as asthma. Conversely, oral health may influence the progression and severity of chronic diseases (20). Tooth decay, commonly

Table 2. Comparison of the quality of life and the dmft/DMFT ratio according to asthma grade

Asthma grade	index dmft/DMFT ratio			Quality of life		
	Mean (SD)	Mean rank	p-value*	Mean (SD)	Mean rank	p-value*
1	7.47 (2.50)	6.0	0.001>	72.82 (2.18)	22.95	0.001>
2	20.23 (3.43)	17.63		65.50 (2.71)	11.46	
3	30.86 (5.70)	25.70		51.40 (10.01)	3.20	

*:Kruskal-Wallis test

Table 3. Comparison of the quality of life and the dmft/DMFT ratio according to asthma grade

Group	Smoker parent	index dmft/DMFT ratio			Quality of life		
		Mean (SD)	Mean rank	p-value*	Mean (SD)	Mean rank	p-value*
Patient	No	17.30 (19.15)	14.50	0.999	66.22 (9.02)	14.81	0.791
	Yes	16.78 (10.45)	14.50		64.70 (9.78)	13.95	
Healthy	No	4.82 (3.66)	15.43	0.929	73.3 (2.08)	14.18	0.733
	Yes	4.03 (5.62)	12.19		73.50 (1.85)	15.31	

*: Mann-Whitney test

Table 4. Comparison of quality of life and the dmft/DMFT ratio based on the duration of asthma

duration of asthma	index dmft/DMFT ratio			Quality of life		
	Mean (SD)	Mean rank	p-value*	Mean (SD)	Mean rank	p-value*
1	8.02 (3.49)	6.39	<0.001	72.44 (3.28)	22.28	0.001
2	15.55 (5.83)	13.44		68.11 (3.33)	15.56	
3	23.75 (2.50)	21.25		64.50 (3.70)	10.38	
4	25.88 (6.12)	22.25		55.25 (7.36)	4.25	
5	34.2 (8.08)	26.75		47.50 (17.65)	3.50	

measured by DMFT and dmft indices in children, is one of the best factors for investigating children's oral health (21). Several studies have been conducted in the field of quality of life and oral health in children with asthma. However, the investigated parameters were different from the parameters investigated in this study. However, the relationship between quality of life and oral parameters has not been investigated (13,22-25). In the present study, 56 children were examined in two asthma and control groups. These two groups were not significantly different regarding demographic characteristics (age, gender, and smoking of parents). The examined groups were homogenous to prevent creating an intervening variable and make the results more reliable. Based on the results, the dmft/DMFT ratio in the asthma children group was significantly higher than that in the control group ($P<0.001$). The mean dmft/DMFT ratio in the case group was recorded as 17.12 ± 9.44. In a study by Bansal et al. (2022) in India, 400 children aged 8-15 years were investigated. They observed that DMFT/dmft was significantly higher in the asthma children group (23). Wierchola et al. (2006) investigated 326 children in the age range of 3-15 years in two control and asthma groups in Poland. They reported that the dmft/DMFT index was significantly higher in the group of patients at the age of 10-13 years (26). The difference in the results in the age range of 8-9 and 14 years may be the geographical location and the different age ranges investigated in the two studies. Additionally, in the present study, the dmft/DMFT of children separately based on the year was not recorded and compared.

The present study also showed a negative correlation between the dmft/DMFT ratio and quality of life. In the study by Dhinsa et al. which was carried out in 2021, consistent with the results of the present study, children with asthma aged 8-16 years had significantly higher dmft/DMFT scores than the control group. Also, the oral health-related quality of life was significantly lower in the asthma children than in the control group (20). The study by Brasil et al. in 2020 also showed a correlation between DMFT score and oral health-related quality of life (27).

A comparison of the dmft/DMFT ratio based on asthma grade revealed that the dmft/DMFT ratio was significantly higher in the severe asthma group. It also seems that the increase in the severity of asthma is related to the dose of corticosteroids. Consistent with the results of the present study, Bansal et al. and Shashikiran et al. reported that the DMFT score was significantly higher in patients with severe asthma (23, 28). Bansal also established a positive correlation between drug administration time, drug dose, and DMFT score in these patients. More numerous dental carious lesions observed in patients with higher asthma grades might be due to the higher dose of the drugs used or its duration and frequency (23).

Comparing the OHRQoL according to asthma grade in the present study demonstrated that quality of life significantly decreases as asthma grade increases. The study by Brasil et al. reported that the OHRQoL was significantly lower in patients with severe asthma (27). In individuals with systemic, chronic, and severe respiratory diseases such as asthma, cystic fibrosis, and chronic obstructive pulmonary disease, daily life is disrupted. These diseases reduce the health-related quality of life of patients due to two main reasons: the severe and mild symptoms of the disease and its impact on other organs, and mental health conditions such as depression and stress (29). The reduction of OHRQoL in systemic diseases is due to the general disease burden, pain, and impact on daily life (29). It has been proven that asthma is associated with reduced HRQoL (27). Thus, impairment in HRQoL due to general diseases can be one of the reasons for a reduction in OHRQoL in our study.

Oral health and oral condition should be considered more in these patients due to the impact of OHRQoL on HRQoL. It was observed that these patients pay less attention to their oral health. It might be due to the general attention of the physician and the person on the involved organ and neglecting oral health (30). Moreover, these patients have poorer mental and psychological conditions to take care of selves and others should support and encourage them to observe their oral health (31). Thus, as stated by Schmalz in 2020, it is crucial to use a preventive and patient-oriented individual dental care concept, focusing on the risk and needs of these patients (32).

Conclusion

The results revealed that the quality of life and the dmft/DMFT ratio in the asthma children were significantly lower and higher than in the control group (P<0.001). Also, a reduction in the quality of life and an increase in the dmft/DMFT ratio were significantly related to the severity of asthma. In general, there is a negative correlation between oral health-related quality of life and the dmft/DMFT ratio.

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