

# Mindfulness in the Relationship Between Perceived Stress and Quality of Life in Pediatric Asthma

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## Abstract

**Purpose:** The purpose of this study is to analyze the possible mediator effect of mindfulness in the relationship between perceived stress and quality of life in pediatric asthma. **Methods:** The sample of this study consisted of 100 asthmatic children aged between 9-12 years who applied to İstanbul University İstanbul Medical Faculty Hospital's "Child Allergy Polyclinic". Sociodemographic information forms, Perceived Stress Scale in Children (8-11 years), Child and Adolescent Mindfulness Measure (CAMM) and Pediatric Asthma Quality of Life Questionnaire (PAQLQ) were used as data collection tools. **Results:** Linear hierarchical regression analysis was used during the process of analyzing data. It has been identified that mindfulness has a partial mediator role, in the relationship between perceived stress and quality of life ( $p=-.474$ ), in the relationship between perceived stress and symptoms which is the subscale of quality of life ( $p=-.399$ ) and in the relationship between perceived stress and emotional function ( $p=-.514$ ) which is the quality of life's subscale. The mediating role of mindfulness in the relationship between perceived stress and activity limitations could not be inspected due to the lack of a significant correlation between activity limitations which is subscale of quality of life and mindfulness ( $p=.136$ ). **Conclusions:** When all these findings are evaluated, it might be beneficial for experts dealing with pediatric asthma to add psychotherapy interventions involving mindfulness practices to the treatment of the disease.

## KEYWORDS

asthma, child, mental health, mindfulness, quality of life

## 1 | INTRODUCTION

Asthma, characterized as chronic airway inflammation, is the most common chronic lung disease in childhood. Asthma often starts in childhood even though it could be observed in all stages of life. The disease often present itself in episodes. The symptoms are wheezing, tightness in chest, trouble in breathing and coughing.<sup>1</sup> Worldwide the prevalence of childhood asthma is 9.4%.<sup>2</sup> The prevalence of childhood asthma is 13.36% in Turkey.<sup>3</sup>

Even though there are environmental and personal factors that affect prevalence of childhood asthma episodes, recent studies have shown that psychological factors such as somatization, behavior problems, attention deficit and hyperactivity disorder (ADHD), depression, anxiety and stress also are crucial on episodes.<sup>4-9</sup> Therefore, known psychological trigger such as stress have a negative impact on children's quality of life.<sup>10</sup> For instance, facing hardship in conducting physical and social activities thus leading children feeling different and inadequate from their peers.<sup>11</sup>

Children's quality of life also is affected by asthma control. Asthma control is associated with fluctuations in asthma symptoms under treatment. It could be explained as the prevention of risks that may cause

asthma symptoms and control of symptoms.<sup>12</sup> In order to increase quality of life in children with asthma, components such as mindfulness are needed to help reduce stress levels and keep the disease under control.

Mindfulness is the awareness arising from paying attention, intentionally, in the present moment and without judgment. It has been found that there is a positive correlation between mindfulness and perceived health with physical well-being.<sup>13</sup> They also demonstrated that in adults; as mindfulness rises, perceived stress decreases on psychological well-being.<sup>13</sup> Mindfulness-based practices improve psychological and physiological health of children and adolescent.<sup>14</sup> Mindfulness positively affects health by reducing stress on chronic diseases.<sup>15</sup>

In a study conducted on young adults with asthma, the diagnosis and symptoms of asthma decreased in people with high mindfulness.<sup>16</sup> The same study also found that asthmatic people have higher levels of mindfulness than non-asthmatic people.<sup>16</sup> The mindfulness program has been proven to significantly improve the quality of life in asthmatic people and this program specifically improves the emotional functionality of patients.<sup>17</sup> This program when used as a supplementary treatment to routine medical treatments, improves the quality of life in people with asthma.<sup>18</sup> Mindfulness practices regulates the physiological stimulation via regulating breathing and slowing heartbeats, leading positive improvement in the progress of the disease.<sup>19-20</sup> As perceived stress decreases, there is a correlating increase in the quality of life of patients with asthma, which has been proven to be associated with mindfulness.<sup>7</sup>

Even though there are research about mindfulness and asthma in adults, there are limited research about mindfulness in children with asthma. It was indicated that by decreasing asthma-oriented stress mindfulness increases; therefore, quality of life based on asthma has positively affected in adolescents.<sup>21</sup> Even though mindfulness, perceived stress and quality of life on asthmatic people separately indicated in a different research; there is no study in the literature that investigates the effect of all the variables on the pediatric asthma. The purpose of this study is to demonstrate that mindfulness has a mediator effect on the relationship between perceived stress and quality of life in children with asthma.

## 2 | MATERIALS AND METHODS

Ethics Committee Approval was obtained from Işık University on 02.09.2019. Işık University Clinical Psychology Graduate Coordination Office has given permission to conduct research at the İstanbul University İstanbul Medical Faculty Hospital's "Child Allergy Polyclinic".

This is a research created in a cross-sectional design. Data collection process was carried out in January, February and March 2020. Children and parent/guardian read and signed the informed consent form to indicate that they voluntarily participated in the study.

### 2.1 | Population and Sample

The participants resorted "Child Allergy Polyclinic" at the Çapa Campus of Istanbul University Istanbul Medical Faculty Hospital. The sample of this study consists of 100 asthma patients between the ages of 9-12 who has been diagnosed according to GINA criteria by physicians. There are inclusion and exclusion criteria in the sample creation process. The inclusion criteria were being between the ages of 9-12 and diagnosed allergic asthma according to GINA criteria by physicians. The exclusion criteria were having a psychiatric diagnosis according to DSM 5, using psychiatric medicine and receiving psychological therapy. The sample selection process was random.

### 2.3 | Measures

#### 2.3.1 | Demographic Information Forms

Two demographic information forms which have questions such as age, sex, educational level etc. were used on one for parent/guardian and one for the child in the research.

#### 2.3.2 | Determining Asthma Control Level of The Participants

Physicians considered GINA criteria for determining asthma levels of participants. These criteria include daily symptoms, activity limitation, night symptoms, usage bronchodilator and pulmonary function test (PEF and FEV1). In addition, the patient's attacks were controlled by physicians.

### 2.3.3 | Perceived Stress Scale in Children (8-11 Years)

It was developed the scale to assess children's perceived stress level.<sup>22</sup> The scale's internal consistency reliability is .76 and test-retest correlation is .79. Turkish version of the scale's internal consistency reliability is .76 and test-retest correlation is .71.<sup>23</sup> The total number of items is 9 and the answers are given according to the 4-point Likert scale. The highest point means the highest perceived stress. The minimum point is 9 and the maximum point is 36. Even though "Perceived Stress Scale in Children" is for 8-11 years children, this scale was applied to 12-year-old children in this study. According to the reliability analysis results that 12-year-old children also participated in, the Cronbach alpha ( $\alpha$ ) internal consistency reliability of the scale in this study was found .71.

### 2.3.4 | Child and Adolescent Mindfulness Measure (CAMM)

CAMM was developed to measure the acceptance and focus of the current moment without trying to change the emotions and thoughts of children over 9 years old.<sup>24</sup> The scale's Cronbach alpha ( $\alpha$ ) internal consistency coefficient is .80. The Turkish psychometric assessment of the scale was measured with 211 adolescents aged 14-18.<sup>25</sup> According to psychometric assessment, the scale's internal consistency coefficient is .80. The English and Turkish version of the scale consist of 10 questions. The answers are scored as 0 (never true), 1 (rarely true), 2 (sometimes true), 3 (often true) and 4 (always true). High scores indicate the level of mindfulness is high. In this study, Cronbach alpha ( $\alpha$ ) coefficient was found .68.

### 2.3.5 | Pediatric Asthma Quality of Life Questionnaire (PAQLQ)

The scale was developed in order to determine the level of educational, physical, social and emotional difficulties experienced in their daily lives for children diagnosed with asthma between the ages of 7-17.<sup>26</sup> It consists of 23 items and the answers are for some items are given according to the 7-point Likert scale. The scale has 3 subscales consisting of activity limitation, symptoms and emotional function.

Turkish validity and reliability study was conducted with 122 children between the ages 7-16 and the scale was found valid and reliable.<sup>27</sup> Turkish version of scale's Cronbach alpha ( $\alpha$ ) internal consistency coefficient of the activity limitation subscale was found .80, Cronbach alpha ( $\alpha$ ) internal consistency coefficient of the symptoms subscale was .90, and Cronbach alpha ( $\alpha$ ) internal consistency coefficient of the emotional function subscale was found .86. The Turkish and English version of the scale consist of 23 items. The scores range from 23 to 161. The high score shows high level of quality of life while the low score indicates low level of quality of life. This research's the Cronbach alpha ( $\alpha$ ) value of the quality of life scale was found .89, Cronbach alpha ( $\alpha$ ) coefficient of activity limitation was .75, Cronbach alpha ( $\alpha$ ) value of symptoms .76 and finally Cronbach alpha ( $\alpha$ ) coefficient of emotional function subscale was .87.

## 2.4 | Statistical Analysis

Before starting the analysis of the research, the criteria of inclusion and exclusion were considered. The data 100 of 101 participants were included in the analysis of the research. One of participant's data were not included to the analyses, because of continuing psychiatric treatment.

In this study, data of 100 participants were analyzed with SPSS version 23. Firstly, correlational relationships between variables were examined by Pearson correlation analysis.

In the next step, regression analysis was conducted to control whether have a significant mediator effect in correlative relationships. The mediator variable analysis, there are four considerations.<sup>28</sup> These four considerations were the effect of independent variable on dependent variable is significant; the effect of independent variable on mediator variable is significant; the effect of mediator variable on the dependent variable is significant and when controlling the effect of mediator variable, loss of meaning of the independent variable's

effect on the dependent variable. These considerations were controlled and all analysis was implemented by following the linear hierarchical regression analysis steps.

Finally, according to the participant's asthma control level; perceived stress, mindfulness and quality of life were examined by 3 different one way-ANOVA analysis.

### 3 | RESULTS

#### 3.1 | Demographic data of asthmatic children and parents/guardians

A total of 100 children ranging between 9-12 years were included. Most of participants were male (69%). The mean age of sample was 10 (SD=1,16). There was a dominance of controlled asthma according to GINA guidelines (51%). Table 1 determine the demographic characteristics of the sample according to asthma control.

#### 3.2 | The mediation analysis of CAMM in the relationship between perceived stress and PAQLQ

In Table 2, correlational relationships display for all variables. In the first mediation analysis, Linear regression analysis showed that mindfulness has not full mediator effect in the relationship between perceived stress and quality of life which is shown in Table 3. However, according to Sobel Test analysis, mindfulness has partial mediator effect in the relationship between perceived stress and quality of life (Sobel z-statistics=2,81; one-tailed=.000; two-tailed=.000).

#### 3.3 | The mediation analysis of CAMM in the relationship between perceived stress and symptoms

In the second mediation analysis, Linear regression analysis determined that even though mindfulness has no full mediator effect in the relationship between perceived stress and symptoms which is shown in Table 4, according to Sobel Test analysis, mindfulness has partial mediator effect in the relationship between perceived stress and symptoms (Sobel z-statistics=-2.38; one-tailed=.000; two-tailed=.010).

#### 3.4 | The mediation analysis of CAMM in the relationship between perceived stress and emotional function

In the final mediation analysis, Linear regression analysis determined that mindfulness has no full mediator effect in the relationship between perceived stress and emotional function which is shown in Table 5. However, according to Sobel Test analysis, mindfulness has partial mediator effect in the relationship between perceived stress and emotional function (Sobel z-statistics=-2.93; one-tailed=.000; two-tailed=.000).

#### 3.5 | The one way-ANOVA analysis according to asthma control level; perceived stress, CAMM and PAQLQ

As shown in Table 6, according to one way-ANOVA result, quality of life differs by asthma control levels ( $F_{(2,97)}=11.03$ ;  $p=.000$ ). Post-Hoc test was performed to examine which groups have difference. The difference occurred due to the relationship between uncontrolled group and partially-controlled group ( $p=.003$ ), the relationship between uncontrolled group and controlled group ( $p=.000$ ) with the relationship between partially-controlled group and controlled group ( $p=.039$ ).

Asthma control levels has a significant difference on activity limitation which is subscale of quality of life ( $F_{(2,97)}=9,94$ ;  $p=.000$ ) (Table 6). According to Post-Hoc analysis, the relationship arises from the relationship between the uncontrolled group and the partially-controlled group ( $p=.003$ ) and the relationship between the uncontrolled group and the controlled group ( $p=.000$ ).

Symptoms differs by asthma control levels ( $F_{(2,97)}=10,3$ ;  $p=.000$ ) (Table 6). The relationship between the uncontrolled group and the partially controlled group ( $p=.002$ ) and the relationship between the uncontrolled group and the controlled group ( $p=.000$ ) made difference (Table 6).

Asthma control levels has a significant difference on emotional function ( $F_{(2,97)}=5.09$ ;  $p=.008$ ) (Table 6). According to Post-Hoc analysis, the difference occurs because of the relationship between uncontrolled group and controlled group ( $p=.004$ ).

## 4 | DISCUSSION

In this research, the authors determine that mindfulness has a partial mediator effect in the relationship between perceived stress and the quality of life, in the relationship between perceived stress and activity limitation and the relationship between perceived stress and emotional function. However, there is no correlational relationship between mindfulness and symptoms which is subscale of the quality of life.

There are studies investigating the relationship between stress and the quality of life in asthmatics<sup>7</sup>, between stress and mindfulness<sup>14, 15</sup> and between mindfulness and quality of life<sup>21</sup> there are studies investigating the relationship. These studies have similar results with our study. They found significant correlative relationships between perceived stress, mindfulness and quality of life in people with asthma. According to the literature, it is been shown that when mindfulness increases, health and psychological well-being also increase.<sup>14</sup> In chronic diseases when stress reduces due to mindfulness, psychological well-being increases.<sup>15</sup> Mindfulness practises improve the quality of life in asthmatic people.<sup>17</sup> Mindfulness increases asthma-based quality of life and asthma-based stress has a small part in this relationship.<sup>21</sup>

Even though there are research that shows the significant relationship between mindfulness and activity limitation<sup>17</sup>, our finding showed that, there is no correlational relationship between mindfulness and activity limitation. When mindfulness training was applied to an asthma group for eight weeks, a relationship was found between mindfulness and activity limitation and controlled asthma rate increased from 7.3% to 19.4%.<sup>17</sup> There is a difference between our study and the research in question in terms of distribution of asthma control levels. In our study, controlled asthma rate (51%) was higher than partially-controlled (36%) and uncontrolled asthma rate (13%); therefore, the result might be not significant. Furthermore, the seasonal activity rates of the participants might be a confusing factor that may differentiate. There are studies showing that asthma control levels improve due to the low activity rates of people with asthma in winter. For example, adults with asthma may think that their asthma control levels are better in winter because they restrict their activities in winter compared to the summer seasons.<sup>29</sup> The data collection process of our study coincided with the months of January, February and March, our participant group attends to school during the winter months, coincides with most daily activities.

In literature, the symptoms of the disease positively correlate with the stress level of asthmatic people.<sup>30</sup> Asthma symptoms decrease with the increase of mindfulness.<sup>16</sup> In our study, it was understood that mindfulness in pediatric asthma had a partial effect on the relationship between perceived stress and symptoms.

People with asthma decrease their emotional functionality due to inefficient coping with stress.<sup>31</sup> Conversely, it has been observed that the increase of mindfulness levels affects emotional functionality.<sup>32</sup> In our study, it was determined that mindfulness has a partial effect on the relationship between perceived stress and emotional function.

In this study, it was discovered that the perceived stress does not differ according to the asthma control levels, but the perceived stress level decreases hierarchically with the increase of the asthma control level. Literature has shown that the level of stress varies according to asthma control and consistent with our research, low asthma control and excessive stress are associated.<sup>21, 33</sup> In a study, perceived stress increased in direct proportion with both the incidence of asthma and asthma severity.<sup>34</sup>

Mindfulness level did not change according to asthma control level. Similarly, it has been observed that asthma control has no effect on mindfulness scores in adolescents.<sup>21</sup>

Quality of life, activity limitation, symptoms and emotional function differed according to asthma control. When the level of asthma control increase; the quality of life and emotional function also increase; however, activity limitation, symptoms scores decreased. A similar study found that as asthma control decreases, quality of life decreases.<sup>35</sup> Uncontrolled asthma had a higher activity limitation.<sup>36</sup> According to GINA

criteria, there is a negative correlation between asthma control and symptoms.<sup>37</sup> Moreover, aggression, which is one of the emotional factors known to influence emotional functionality, has been found to decrease with increasing asthma control.<sup>38</sup>

When the previous studies were investigated, it might be said that our research has limitations. Compared to other studies, the number of participants was limited and study design was cross-sectional. Therefore, mindfulness may not have full mediator effect on the relationships in question. Although perceived stress decreases when asthma control increases, this model was not significant. It also may be related to the low number of participants. Thus, further research might investigate the same relationships with higher number of participants and design might be longitudinal. Moreover, in further studies, studying activity limitation via equally asthma control group division might occur crucial consequences. It may also be advisable to add a control group in the study to make the results more reliable on a scientific scale.

In conclusion, our study found that there is a relationship between perceived stress, mindfulness and the quality of life in pediatric asthma. Our results suggest mindfulness has a partial mediator impact on the relationship between perceived stress and quality of life, on the relationship between perceived stress and activity limitation which is the subscale of quality of life with on the relationship between perceived stress emotional function which is the quality of life's subscale. Adding mindfulness-based practices to the current medical treatments might reduce perceived stress and increase the quality of life via reducing activity limitation, increasing emotional function. Moreover, health professionals working with asthmatic children, it may be advisable to consider the quality of life including the activities limitation, symptoms of the disease and emotional function in order to control asthma.

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