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The role of trait mindfulness in quality of life and asthma control among adolescents with asthma

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ABSTRACT

Objective: The current study focused on the role of trait mindfulness in asthma-related quality of life (QoL) and asthma control in adolescent asthma patients. Furthermore, potential underlying mechanisms (general and asthma-specific stress) of this relationship were investigated.

Methods: In this cross-sectional study, questionnaire data of 94 adolescents with asthma that were prescribed daily asthma medication were included. Two Structural Equation Models (SEMs), a direct model and an indirect model, were tested.

Results: We found that trait mindfulness was directly related to asthma-related QoL, but not to asthma control. The relationship between trait mindfulness and asthma-related QoL was explained by asthma-specific, but not by general stress. Furthermore, an indirect relation from mindfulness to asthma control via asthma-specific stress was found.

Conclusions: Cross-sectional evidence for a relation between mindfulness and asthma-related QoL is found. These findings may point to the possibility that an intervention aimed at increasing mindfulness could be a promising tool to improve asthma-related QoL in adolescents via a decrease in asthma-specific stress.

1. Introduction

Asthma is the most common chronic disease among adolescents worldwide [1]. Asthma-related quality of life (QoL) and asthma control are two important factors that reflect the impact of asthma on adolescent life [2]. *Asthma-related QoL* refers to the impact asthma has on a patient's well-being [3]. This includes, for example, difficulties engaging in social and physical activities [4]. Adolescents with asthma tend to have a lower QoL than their healthy peers [5]. *Asthma control* refers to the extent to which the manifestations of asthma can be observed in the patient, or have been reduced or removed by treatment [6]. Adolescents, in particular, have problems controlling their asthma, which can affect their lives negatively [7]. Thus, asthma is a major challenge for many adolescents. To improve the life of adolescents who have asthma, it is important to study the factors that could enhance asthma-related QoL and asthma control. In the current study, we examined the association of trait mindfulness with asthma-related QoL and asthma control among adolescents who have asthma.

Mindfulness is defined as the directing of conscious attention to current-moment experiences, including body sensations, thoughts, and emotions, while adopting a non-judgmental and accepting attitude [8]. Research has demonstrated that the ability to be mindful about one's experiences can have several beneficial outcomes in clinical and non-clinical populations [9]. For example, mindfulness – either as a result of training, or as an individual difference variable (i.e. trait mindfulness) – has been associated with reductions in distress, as well as improvements in both physical and psychological well-being, cognitive functioning and attention, and social relationships [10–13]. A general explanation for the stress-reducing function of mindfulness is that bringing and non-judgmental awareness to aversive feelings and thoughts prevents the triggering of additional distress from having such aversive feelings and thoughts ([9,14,15]; for a recent overview, see [16]). Other more specific mechanisms explaining the beneficial effects of mindfulness include improved attention and emotion regulation, and increased body awareness (see [17–19]).

The stress-reducing capacities of mindfulness may be particularly relevant in dealing with asthma. In addition to dealing with general psychological stressors such as school exams or conflicts with parents, adolescents with asthma also have to deal with asthma-specific stress such as worrying about their asthma. Although the precise nature of the relationship between stress and asthma is still debated, stress seems to be a trigger for asthma symptoms [20–22]. Potential mechanisms to explain the relationship between stress and asthma include the negative impact of psychological stress on airway inflammation [23], respiratory

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infection (e.g., [24]), and the development of the expression of atopy (e.g., [25]). Adolescents who are more mindful may experience less general or asthma-specific stress, which in turn may decrease the actual symptoms of asthma (i.e., increase their asthma control) and improve their experienced QoL. In addition, stress may also affect asthma control and QoL because mindfulness could affect the subjective experience of symptoms. It has been shown that negative mood leads patients to associate a wide range of nonspecific symptoms with their asthma, thereby altering the perception of its severity [26]. Thus, mindfulness may increase asthma control and improve QoL, not only by reducing the amount of actual symptoms but also by changing the perception of the symptoms.

Initial evidence suggests that mindfulness is associated with positive outcomes among adult asthma patients. Research shows that mindfulness training reduces stress and increases QoL among adults with chronic illnesses like asthma [27]. Pbert et al. [28] studied the effects of mindfulness-based stress reduction therapy among adult asthma patients, and found positive effects on asthma-related QoL. While there was a small increase in the percentage of adults with well-controlled asthma, this effect was not significant [28]. So far, however, it is unclear whether these results can be generalized to adolescents with asthma. Therefore, the current study investigated the association between trait mindfulness and asthma-related QoL and asthma control among adolescents with asthma. We expected trait mindfulness to be positively associated with asthma-related QoL and asthma control. Furthermore, we examined whether these predicted relationships can be explained by reductions in general stress and asthma-specific stress.

2. Method

2.1. Participants

This study was part of a larger longitudinal study approved by the Ethics Committee of the Faculty of Social Sciences of the Radboud University in the Netherlands. The study was originally designed as a three-year longitudinal study, in which 268 adolescents with asthma and their parents participated at baseline [29]. Families were included if the adolescent met the following criteria: (1) diagnosed with asthma by a physician (2) used some kind of asthma medicine or experienced asthma-related symptoms at least once in the last 12 months, and (3) had adequate Dutch language skills. Details about the recruitment process can be found elsewhere (see [29]). In wave 3, 259 adolescents (96.6%) still participated in the study. Those adolescents were asked whether they would be willing to participate in possible future research, and 236 of them responded positively. These 236 adolescents were contacted to participate in wave 5 (wave 4 was a small pilot study, in which only some of the adolescents were asked to participate). The adolescents who were using some kind of asthma medication or had experienced asthma-related symptoms at least once in the last 12 months were included in wave 5. Of the 236 adolescents who were contacted, 146 (61.8%) agreed to participate in wave 5 and met the inclusion criteria. Of the 90 adolescents who did not participate, 69 (76.7%) had not experienced asthma-related symptoms nor were using asthma medication in the last 12 months; 14 (15.9%) did not want to participate anymore, and we were unable to contact 7 adolescents (7.8%). For 141 of the 146 willing participants, it was possible to schedule a home visit for data collection. Of this group, the current study included the data of the 94 adolescents who were prescribed daily preventive asthma medication (anti-inflammatories) by a doctor in the 5th wave. This inclusion criterion was chosen to ensure that asthma had a certain level of severity and interference with daily life (as was done in previous studies; [30,31]). Of these adolescents, 56.4% used a combination of inhaled corticosteroids and a separate bronchodilator (of which 60.4% fluticasone propionate with salbutamol, 9.4% beclomethasone with salbutamol, and 30.3% used various other combinations); 30.9% used combination inhalers consisting of inhaled corticosteroids and long-acting bronchodilators combined with a separate short-acting bronchodilator (of which 62.1% salmeterol and fluticasone/salbutamol, 17.2% formoterol with budesonide/salbutamol, and 20.7% other); 8.5% used combination inhalers consisting of inhaled corticosteroids and long-acting bronchodilators without a separate short-acting bronchodilator (of which 50% used salmeterol with fluticasone, 37.5% used formoterol with budesonide, and 12.5% other); and 4.3% only used inhaled corticosteroids (of which 50.0% fluticasone propionate and 50.0% other). The participating 94 adolescents (53 boys) were aged between 14 and 18 years (M = 16.24, SD = 1.02) in the 5th wave.

2.2. Measures

2.2.1. Mindfulness

Mindfulness was measured with the Child and Adolescent Mindfulness Measure (CAMM; [32]) and the Mindfulness Attention Awareness Scale Adolescents (MAAS-A; [10,33]). We chose to use two questionnaires that, together, encompass the multi-component concept of mindfulness. This includes attention to experiences and non-judgmental acceptance of experiences, both of which are intrinsic aspects of mindfulness (see Bishop et al. [56]). The MAAS-A (α = 0.83) consists of 14 items that were answered on a 6-point Likert scale (“always” to “never”). All items reflect attention specifically (e.g. “I tend not to notice feelings of physical tension or discomfort until they really grab my attention.”). While the MAAS is one of the most widely used measures of trait mindfulness, it has been criticized for not including the non-judgmental acceptance component as an intrinsic part of mindfulness (e.g. [34]). The CAMM (α = 0.82) consists of 10 items that were answered on a 5-point Likert scale (“never true” to “always true”), with 8 of the 10 items reflecting non-judgemental acceptance of experiences (e.g. “I get upset with myself for having feelings that don't make sense.”). Thus, together, these two scales capture the concept of mindfulness as non-judgmental attention to current-moment experiences. For both scales, we reverse scored the appropriate items, such as higher scores reflect higher trait mindfulness. Reliability of the combined items of both scales was good (α = 0.82).

2.2.2. Asthma-related QoL

Asthma-related QoL was measured with the subscales medication, physical activities, social interactions and emotions of the Adolescent Asthma Quality of Life Questionnaire (AAQOL; [4]). The questions were answered on a 7-point Likert scale (response categories varied per question). For some items, a response category ‘not applicable’ was included, which was recoded to a seven (reflecting high QoL) as guidelines for the AAQOL suggest. The medication subscale has five items (e.g. “How bothered or concerned have you been about taking medication for your asthma?”), the physical activities subscale has six items (e.g. “How often have you been restricted in sports, hobbies, or other recreational activities because of your asthma?”), the emotions subscale has five items (e.g. “How often did you feel frustrated because of your asthma?”) and the social interaction subscale has five items (e.g. “How often did you feel worried or embarrassed when taking asthma medication in front of other people?”). As in previous studies [35,36], and since we had no specific a priori predictions about how mindfulness may affect each of these subscales, an overall QoL score was created based on these four subscales (α = 0.90). A higher score reflected higher asthma-related QoL. Two other subscales in the AAQOL, positive effects and symptoms, were not used in this overall score. The subscale symptoms was not used because of the overlap with the asthma control measure. Since the positive effects subscale measured the positive impact of having asthma instead of the negative, the developers of the AAQOL recommend that this subscale should not be added to the overall score [4]. In a previous study conducted on adolescents with asthma, a latent factor was used based on the four QoL subscales. The standardized factor loadings varied between 0.72 and 0.91, and were,