15th psychology Days in Zadar: Book of Selected Proceedings, University of Zadar, str.213-221.

FAMILY DETERMINANTS OF CHILDHOOD ASTHMA

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UDK: 316.614.5 : 616.2

Abstract

Asthma is a widespread public health problem and the most common chronic illness in childhood and adolescence. According to the Croatian national data the asthma prevalence in the pediatric population is between 1.5% to 5% representing 1/4 of all chronic disease in childhood and adolescence.

The aim of the investigation was to determine the specific family variables which are related to asthmatic symptoms in children. The family variables were operationalised as two parenting dimensions: control and emotionality. The study was focused on two samples: a group of schoolchildren with asthma (N = 46) in pediatric care and a group of healthy schoolchildren (N = 42). The ANOVA was used to assess the difference in the perception of parenting practices between the two groups of children. Significant differences were found in three scales: Emotionality-Mother, Emotionality-Father and Control-Father. In both cases asthmatic children rated their parents lower on emotionality than healthy children, and when compared to healthy children, they also perceived their fathers to be more controlling towards them.

Keywords: asthma, parenting style

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Introduction

Asthma is a chronic inflammatory disorder characterized with the intermittent and variable periods of airway obstruction. The pathophysiology of asthma involves chronic inflammation, airway hyper responsiveness, bronchoconstriction, swelling of the airways and mucus obstruction. The etiology of asthma includes an interaction among genetic factors (predisposition to allergy), environmental influences (exposure to infectious agents, allergens or irritants) and psychological influences (stressful life events) (McQuaid & Walders, 2003).

Epidemiological studies suggest that asthma is a widespread public health problem and the most common chronic illness in childhood and adolescence, affecting 2% to 13% pediatric population worldwide (Aberle & Reiner-Banovac, 1998). According to the Croatian national data, the asthma prevalence in the pediatric population is between 1.5% to 5%, representing ¼ of all chronic disease in childhood and adolescence (Mardešić, 1991). The estimation of the occurrence of asthma in children in Western countries is about 5 to 10% (Mardešić, 2003). Asthma accounts for 30% of pediatric hospitalizations, for approximately one third of school absences and for numerous other psychosocial complications (Fritz et al., 1996). Asthma exacerbations can vary in severity and duration across three categories: from mild intermittent to severe persistent. Children may experience mild symptoms such as coughing when laughing, crying or running, shortness of breath and chest tightness. These symptoms may progress to wheezing or heavy breathing. In severe cases, if the attack persists without treatment, the child could become unconscious, develop seizures due to the lack of oxygen and suffer brain damage due to hypoxia. Severe attacks of asthma my be fatal, and in recent years fatalities due to asthma have increased (Carr, 1999; Mrazek, 2003). According to the 1988 National Health Interview Survey (see Annett, 2004) it is found that 59% of children have mild, 32% have moderate and 10% have severe asthma. Asthma symptoms are most likely to present in children before the age of 5 years and it is estimated that about 50% to 80% of preschool children will develop asthma symptoms like coughing, wheezing, shortness of breath, rapid breathing and chest tightness (Annett, 2004).

Asthma is a reversible reactive airway disease with numerous physiological and psychological predisposing factors implicated in its etiology. The first type (also known as extrinsic asthma) begins when the immune system provokes antibodies that cause the bronchial tubes to release histamine. Typically, the symptoms occur as a result of airway hyper-responsiveness to a variety of triggers including airborne irritants and allergens that bring about the symptoms in the individuals with specific hypersensitivity of the immune system, but different environmental (e.g. dust), seasonal (e.g. weather changes) and infections factors (e.g. respiratory infections) are also involved. Hypersensitivity is attributed to multiple factors: airway inflammation, deficiencies in bronchial epithelial, integrity, changes in autonomic neural control of airways, modifications in intrinsic smooth muscle function and baseline airways obstruction (Lemanek & Hood, 1999). Such children may be genetically predisposed to developing asthma and they typically have relatives who have suffered from asthma, allergies, hay fever or eczema. The risk of inheriting asthma or hay fever/allergic rhinitis is 50% when at least one parent has the disease (Lemanek & Hood, 1999).

The second type (also known as intrinsic asthma) is more correlated to psychological factors that lead to autonomic arousal (e.g. stresses within the family, school or peer group that pose an immediate threat to the child's perceived safety and security causing anger or anxiety) or that are related to children's coping style and adaptation to chronic illness (Carr, 1999; Lemanek & Hood, 1999).

Subsequent research indicated that in approximately 15-30% of individuals with asthma, stress and emotion are identified as the triggers for asthma episodes. Psychological factors have long been recognized to have a role in the development and course of pediatric asthma and there has been a growing interest in the emotional and behavioral functioning of these children.

Before the advent of modern immunology asthma was considered primarily a "nervous disease". Psychosomatic models of illness followed in an attempt to integrate biological and psychological influences in the expressions of asthma. At the basis of this concept there was a psychodynamic view of asthma as excessive unresolved dependence on the mother. Over the time, it became obvious that the etiology of asthma is likely due to the complex interactions and integration of genetic, immunological and psychological factors in both the onset and course of asthma (McQuaid & Walders, 2003). There are variuos viewpoints on the associations between chronic physical conditions in children (including asthma) and the adjustment to illness and psychological factors. Few integrative models have been proposed in recent years to explain these associations. They are set mostly within ecological–systems theory and focus on physiological processes, psychological vulnerability and life circumstances in explaining the psychological aspects of chronic physical conditions.

The first one is the disability – stress – coping model proposed by Wallander & Varni (Wallander et al., 2003). In this model coping strategies and the cognitive appraisal of disease-related and disease-unrelated events are considered to be stress–processing factors that may enhance a parent's resistance to stress. In the transactional stress and coping model devised by Thompson and his colleagues (1992), there are three processes acting as mediators to adjustment: 1) cognitive processes in children and parents, such as the appraisal of daily hassles and illness tasks, efficacy expectations and self-esteem; 2) family functioning, especially support or conflict; and 3) coping strategies used by parents and children. Rolland (1990) has developed the family systems-illness model proposing that problems connected with chronic illness result in a threatening and perceived loss for the ill individual as well as the family members (e.g. loss of functions and abilities, loss of the usual roles, etc.). Rolland suggests that families with a chronically ill child must not give up on major family goals in order to adapt, but must readjust their goals and develop a meaning for the illness that reestablishes the families' sense of competence and control. Wood and her colleagues (2000) have developed the bio-behavioral family systems model that explores how specific maladaptive family processes determine the extent to which children develop adjustment problems to chronic illness. Wood argues that children's problems may be maintained or exacerbated in the interaction of the child's illness, psycho-physiological reactivity and the family status.

In Wood's model there are five family processes that either buffer or exacerbate biological processes related to illness activity in children: 1) proximity is defined as the extent to which family members share personal space, private information, and emotions; 2) generational hierarchy refers to the extent to which caregivers are in charge of the children by providing nurturance and limits through strong parental alliance and absence of cross-generational coalitions; 3) parental relationship quality refers to interactions patterns, which include mutual support, understanding and adaptive disagreement versus hostility, rejection and conflict; 4) triangulation refers to involving a child in the parental conflict process in ways that render the child responsible, blamed, scapegoat, or in loyalty conflicts; 5) responsiveness refers to the extent to which family members are physiologically responsive to one another.

All the mentioned depict sets of risk and protective factors that interact to affect adaptation to illness and include the child's characteristics (e.g. coping style), family functioning (e.g. cohesion), social- ecological variables (e.g. external support) and

illness/disability variables (e.g. severity). Asthma attacks may be precipitated and maintained by numerous family factors including enmeshment or over-involvement with a highly anxious parent, triangulation (where the child is required to take sides in a conflict between the parents) or a chaotic family environment (where parents set no clear rules and routines for the children's daily activities or medication regime when asthma attacks are likely to occur). A number of works in this field have identified two broad dimensions of parenting practice: one describing parenting as behavioral or psychological control (i.e. control) and the other closely related to parenting as acceptance, emotional availability, sensitivity and a parent-child emotional bond or attachment (i.e. emotionality) (Cummings et al., 2000).

The aim of the investigation was to determine the specific family variables which are related to asthmatic symptoms in children. The family variables were operationalised as two parenting dimensions: control and emotionality. It was hypothesized that different parenting practice would be helpful in the differentiation between children with asthma and healthy children. Therefore, the general aims of the present study were to examine the differences between asthma sufferers in pediatric care and their matched controls without asthma for different aspects of the perception of parenting.

Method

Participants

The participants in this study represented a sub-sample from an ongoing study on psychosocial aspects of psychopathology in children. For the purpose of the present study we focused our attention on two samples.

1) A group of schoolchildren with asthma (N = 46) in pediatric care. This sample comprised of individuals who met the established criteria for identifying asthma and were referred to the examination by pediatric care. The children originally were observed in an outpatient clinic in Zadar over a 6-month period. The children with asthma and some other serious disease or physical problem were excluded.

A total of 46 subjects (38 boys and 8 girls) aged between 10 and 15 (M = 12.89; SD = 1.37) were included in the study. The children's asthma problems were rated by an experienced pediatrician in three groups: mild severity (N = 16), moderate severity (N = 26) and severe asthma (N = 4).

2) A group of healthy children (N = 42) from a PSS standardization sample. The Psychosomatic Symptoms Questionnaire for Children and Adolescents (PSS) is a 35-item scale that inquires about 35 somatic symptoms and sensations. PSS was applied on the sample of 278 primary school children. Four inclusion criteria for this group were established according to the following answers in PSS:

- Answer *Very good* or *Excellent* to the first PSS question *How would you range your health generally?*

- Answer *No* to the second question *Did you go to a physician due to the problems you experienced?* This referred to the 35 symptoms listed above the question;

- Answer *No* to the third question *Do you suffer from an illness such as asthma, allergy, diabetes, etc.?*

- The total score on the 35- symptom list was less than 43 (lower quartile established on the PSS standardization sample).

A total of 42 subjects aged between 11 and 15 years (20 boys and 22 girls) fulfilled the four inclusion criteria and were enrolled. Matching was conducted because it was not possible to randomly assign participants to the asthma-free control group and it was the most reasonable method for equating the two groups.

Instruments

Two self-report questionnaires were used in this study. Their main characteristics were established in previous standardization procedures and they are presented in Table 1.

Perception of Family Interaction Scale (SPOO, Macuka, 2004) is a 25-item self-report questionnaire designed to assess the child's perception of two basic dimensions of parenthood: emotionality (15 items) and control (10 items). Subscale Emotionality describes the emotions that parents express toward their children. It refers to a common set of parenting characteristics, including parenting support, expressions of warmth or positive emotional tone and responsiveness to children's psychosocial needs. Subscale Control describes parental behavior characterized by communication of a set of rules, monitoring and supervision of children. A 3-point response scale is used (1 = not true for me, 2 = partially true for me, 3 = true for me). Total score for subscale Emotionality ranges from 15 to 45 and for subscale Control total scores ranges from 10 to 30.

The Psychosomatic Symptoms Questionnaire for Children and Adolescents (PSS) (Vulić-Prtorić, 2005) is a 35-item scale that inquires about 35 somatic symptoms and sensations (cardiovascular, respiratory, gastrointestinal, dermatological, pseudoneurological, and pain/weakness). The subjects were asked to rate the frequency of each symptom (*How often did you have this problem in the last 3 months?;* 1 = never, 2 = a few times a month, 3 = a few times a week, 4 = almost every day) and then the distress degree (severity) of each symptom they experienced (*How much does it bother you in daily activities?;* 1 = does not bother me at all, 2 = it bothers me a little, 3 = it bothers me a lot). Thus, the PSS Frequency subscale total score ranges from 35 to 140 and the total score for Severity subscale ranges from 35 to 105.

The integral part of the PSS had also 3 questions: the first one was posited at the beginning of the list of the symptoms. The subjects were asked *How would you range your health, generally?* (1 = bad, 2 = moderate, 3 = very good, 4 = excellent). The second one was at the end of the symptoms list and it was an additional question about the severity of the symptoms the subjects experienced and rated on the list. The subjects were asked *Did you need to go to a physician due to the problems you experienced?* (1 = yes, 0 = no). The third question was about the general health status of the subjects and it asked *Do you suffer from any illnesses such as asthma, allergies, diabetes, etc.?* (1 = yes, 0 = no).

For the purposes of this study only Frequency scale data were used.

Table 1
Description of instruments used in the current study

	Number of items	Score range	α
PSS Frequency subscale	35	35-140	.88
SPOO Emotionality subscale - mother	15	15-45	.84
SPOO Emotionality subscale - father	15	15-45	.85
SPOO Control subscale – mother	10	10-30	.75
SPOO Control subscale – father	10	10-30	.78

Procedure

Self report questionnaires were individually administered to the sample of children with asthma, and group administered to the community sample of healthy controls during a regularly scheduled classroom period. The study presented here is part of a larger research project in Croatia. The questionnaires presented in this paper were part of a broader battery of instruments dealing with psychopathology in childhood and adolescence, as well as different personal and contextual risk and protective factors.

The research project was approved by the Ethical Committee of the University of Zadar and was carried out according to the ethical principles of the Croatian Psychological Society.

Results

The ANOVA was used to assess the children's perceptions of parenting practices in two samples (the group of children with asthma and healthy controls), separately on the following parenting measures: emotionality – mother, emotionality – father, control – mother, control - father. As can be seen from Table 2, the results indicated that two groups differed in the perceptions of parental emotionality. More specifically, children with asthma perceived both their parents as less emotionally warm and their fathers as more controlling and overprotective than healthy children.

Table 2
Perception of parenting practice scores in children with asthma (N = 46) and healthy controls (N = 42)

	Children with asthma		Healthy controls			
SPOO subscale	M	SD	M	SD	F (1,86)	p
Emotionality - mother	39.06	4.54	40.91	3.69	4.34	.04
Control – mother	14.26	3.38	13.54	3.15	1.07	.30
Emotionality - father	37.73	4.65	40.03	3.62	6.06	.01
Control – father	14.49	3.73	12.49	2.48	7.39	.00

Discussion

The present study sought to investigate the links between family variables (control and emotionality) and asthma symptoms. With regard to some previous research results it was expected that healthy children and children with asthma could be differentiated with regard to these two variables. For the purposes of good prevention it seems necessary to examine the children's experience and perception of the characteristic parenting styles.

The present study found that compared to healthy children, children with asthma perceived both their parents (mother and father) as less emotionally warm and found their fathers to be more controlling. Although the two groups differed in the estimated emotional warmth of mothers, it should be noted that difference was less than two points. Despite the fact that the present study was relied on children's perceptions of their parents child-rearing style and the inclusion of parental data would have yielded a more complete picture, it should be mentioned that the correspondence of the parent and child reports about family processes might disagree and it is of great interest to know the child's point of view.

Asthma is a chronic pediatric illness that affects the whole family and family factors reciprocally affect the child with asthma. The implementation of skills for effective asthma management results from the complex interactions between parent and child. On the one hand, parenting a child with a chronic illness appears to influence the emotional functioning of both mother and father. Eccleston et al. (2004) found that parental pre-treatment scores for parental emotional status were clinically significant for depression in 40%, for anxiety in 62% and for parenting stress in 31% of the parents of children with chronic pain. Parents of children with asthma have to cope with a lot of situations that provoke their anxiety, helplessness and worry. The child's pain, attacks and respiratory symptoms in asthma, may be extremely distressing for both the child and the parents. Family characteristics such as overprotection, monitoring and a lack of conflict resolution could also be a secondary effect resulting from frequent emergency visits (Wjst et al., 1996). The fact that asthma may be fatal leads some parents to feel more anxious and therefore respond to asthma in more overprotective and controlling way. They need to establish clear rules and routines for their own and children's daily activities and medication regime. Daily life could be disrupted as a result of parenting a child with a chronic illness like asthma. One descriptive study of 20 parents of children with inflammatory bowel disease demonstrated that 15% of parents reported career restriction as a result of their child's illness condition (Akobeng et al., 1999). Parents

should involve children in the disease management process by providing more directive guidance and more supervision of medication regimes. As a result of these parental emotional functioning, they could be perceived by their child as more controlling and less emotionally warm. In the present study children described their parents as less emotionally warm using the following questionnaire statements: *Do not comfort me when I am sad; Do not accept my mistakes; I have the feeling that he/she does not notice me at all; He/she is not on my side when I need it; Often said that do not have time to talk with me.* They also described more control perceived in their interactions with father using the following questionnaire statements: *He is questioning me all the time; He is lecturing me about how I should behave; He is black mailing me to obey his rules.*

On the other hand, children suffering from asthma attacks experience anxiety, embarrassment, sadness and occasionally have fears of suffocation and dying (Wjst et al., 1996). Consequently, they can become more psychologically hypersensitive and over reactive to parental demands for following medical regime. Some research suggests that school-age children with asthma have many misinterpretations about the illness and the use of medications due to the clinical picture that may be difficult for even adults to understand (McQuaid & Walders, 2003). Consequently, children could interpret the parents' demands for medical tasks and adjustment to illness related conditions in a more controlling and punitive way. Additionally, it was well documented that children with asthma have a depressogenic cognitive style and are generally more vulnerable to internalizing problems such as depression and anxiety (Lemanek & Hood, 1999). This attributional style also contributes to the child's individual negative perception of himself, his parents and the future. But, the relatedness between child's asthma and parenting style is always bidirectional. In the study of 337 children with asthma and their parents, it was found that asthma severity may be a salient stressor to parents, who in turn report higher levels of child internalizing symptoms for children with severe asthma, than to children themselves (Wamboldt et al., 1998).

Additionally, some limitations of this study can be connected with the gender structure of both clinical and control group: the number of boys in the clinical group was significantly larger than the number of boys in the healthy group. This disproportion in ratio of boys and girls in the clinical group can be explained by the greater occurrence of asthma in boys than in girls generally. We can assume that this disproportion could have affected the results by lowering the statistical power of this analysis.

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