

Alina Żurek¹*University of Wrocław*Agnieszka Pirogowicz-Hirnle², Nina Chrobot³*SWPS University of Social Sciences and Humanities*

Anxiety intensity levels of children suffering from bronchial asthma and how they cope

Abstract:

Bronchial asthma is the most frequent chronic pulmonary disorder in the world. Population studies indicate about 10% of children in Poland suffer from it. Nowadays, the illness is mild and rarely severe due to specialized treatment. Regardless of how the illness develops, recurring asthma attacks can cause a person suffering from it to feel stigmatized, and result in tension and stress. When under stress, a sick person activates their own characteristic coping strategies, which help them to reduce discomfort. Our paper analyzes both the anxiety intensity levels experienced by children suffering from bronchial asthma and how they cope. Seventy-one children diagnosed with chronic respiratory condition, aged 12–15, were examined during their sanatorium treatment, using the State-Trait Anxiety Inventory for Children (STAIC) by Spielberger, adapted by Sosnowski, Iwaniszczuk, and Spielberger, and the *Jak Sobie Radzisz?* (*How Are You Coping?* – HAYC) Scale by Juczyński and Ogińska-Bulik. Thirty-eight per cent of the examined children had a high anxiety level, and 33% were diagnosed with a high anxiety-as-a-trait level. The results show significant differences between boys and girls on the anxiety trait scale, focusing on emotions strategy and seeking social support strategy. Girls have higher results on the above-mentioned scales. It was observed in the whole group of examined children that there is a statistically significant positive interrelationship between anxiety-trait results and focusing-on-emotions strategy in a dispositional stress-coping style. It is recommended to include psychotherapeutic assistance for children in standard bronchial asthma treatment.

Keywords:

asthma, anxiety, coping with stress, children

Streszczenie:

¹ Alina Żurek, Institute of Psychology, Faculty of Pedagogical and Historical Sciences, University of Wrocław, ul. Dawida 1, 50–527 Wrocław, Poland; alina.zurek@uwr.edu.pl

² Agnieszka Pirogowicz-Hirnle, SWPS University of Social Sciences and Humanities, Ostrowskiego 30B, 53–238 Wrocław, Poland; agnieszka.pirogowicz@gmail.com

³ Chrobot Nina, SWPS University of Social Sciences and Humanities, Department of Marketing Psychology, Chodakowska 19/31, 03–815 Warsaw, Poland; ninachrobot@gmail.com

Astma oskrzelowa jest liderem przewlekłych schorzeń dróg oddechowych na świecie. Populacyjne badania wykazują, że występuje u około 10% dzieci w Polsce. Obecnie przebieg choroby dzięki ukierunkowanemu leczeniu jest łagodny lub umiarkowany, rzadko ciężki. Niezależnie od przebiegu choroby, nawrotowość stanów zapalnych dróg oddechowych w większym lub mniejszym stopniu może stygmatyzować chorych, wywoływać stan napięcia i stresu. W sytuacji stresu chory uruchamia swoje dla siebie strategie radzenia sobie pomagające mu obniżyć przeżywany dyskomfort. Celem pracy stała się analiza nasilenia lęku i przejawianych stylów radzenia sobie ze stresem u dzieci z astmą oskrzelową. Przebadano 71 dzieci w wieku 12–15 lat ze zdiagnozowaną przewlekłą niewydolnością oddechową podczas ich leczenia sanatoryjnego. Wykorzystano do tego Inwentarz Stanu i Cechy Lęku dla Dzieci STAIC Spielbergera w adaptacji Sosnowskiego, Iwaniszczuk i Spielbergera oraz Skalę *Jak Sobie Radzisz?* (JSR) autorstwa Juczyńskiego i Ogińskiej-Bulik. Trzydzieści osiem procent badanych dzieci charakteryzuje wysoki poziom lęku stanu, zaś u trzydziestu trzech procent zdiagnozowano wysoki poziom lęku jako cechy osobowości. Wyniki wskazują istotne różnice pomiędzy chłopcami i dziewczętami na skali lęku, strategii koncentracji na emocjach oraz strategii poszukiwania wsparcia społecznego. Dziewczynki uzyskują wyższe wyniki w wymienionych skalach. Odnotowano również w całej badanej grupie dzieci istotną statystycznie dodatnią zależność między wynikiem lęku jako cechy a strategią koncentracji na emocjach w dyspozycyjnym stylu radzenia sobie ze stresem. Wskazana jest psychoterapeutyczna interwencja w standardowym postępowaniu wobec dzieci z astmą oskrzelową.

Słowa kluczowe:

astma, lęk, radzenie sobie ze stresem, dzieci

Introduction

Bronchial asthma is the most frequent chronic respiratory tract condition in the world. Population studies indicate, about 10% of children in Poland suffer from it, as well as more than 10% of the population in developed countries (Talarowska et al., 2009). Despite progressing development in diagnosis and treatment techniques, asthma negatively affects patients' life quality, and its chronic character limits significantly a person's physical and psycho-social functions. Nowadays, the course of the illness is mild and rarely severe due to specialized treatment. Regardless of how the illness develops, the recurring asthma attacks can cause a person suffering from it to feel stigmatized, and result in tension and stress.

According to research into psychopathological symptoms exhibited by persons suffering from bronchial asthma, more than 10% of the patients have an increased anxiety level (Ciesielska-Kopacz, 1992; Nowobilski, De Barbaro & Furgał, 2002). Talarowska and others (2009) report that as many as 28–49% of children with asthma suffer from an anxiety disorder. Previous studies of patients with bronchial asthma's personality traits show that they are more anxious, less domineering, more self-aggressive, and more depressive than persons from the control group; they have stronger reactions to stress and show a tendency to repress emotions (Nowobilski, De Barbaro & Furgał, 2002). The patient's subjective feelings, for

instance anxiety, sadness, shortness of breath, play a major role in their life quality (Peeters, Boersma & Koopman, 2008; Marsac, Funk & Nelson, 2006). Shortness of breath and anxiety are the main causes for patients' complaints (Nowobilski, 2000). What is more, many children and adults suffering from asthma show a serious anxiety disorder (Katon et al., 2004). It is also observed that there is a significant relationship between a high anxiety level and intensified pathological changes in a patient's respiratory system (Nowobilski, 2000). Thus, one comes to conclusion it is necessary to provide psychological treatment for patients with asthma to relieve their anxiety. According to Nowobilski's research (2000), respiratory treatment based on prolonged contact with a physiotherapist, including psychological therapy (for example, relaxation), is more effective in treating patients with high anxiety levels than impersonal treatment devoid of relaxation. It is also known that psychological factors and a patient's family often decide whether or not doctor's recommendations will be followed. Thus, it is crucial to identify during diagnosis and treatment persons with high anxiety levels and to provide them with proper treatment including psychotherapy, and their families – with an educational program.

Facing illness – and tension and stress, which accompany it – a sick person uses their own characteristic coping strategies which help them to reduce discomfort. Coping means managing negative emotions (resulting from the fact of being sick and the character of that sickness) and being capable of experiencing positive emotions (for example, joy), which neutralize negative emotions. The strategies, characteristic of a given individual and being at their disposal, part of which is activated to cope with the stress – an illness – is termed “coping style” (Heszen-Niejodek, 1996). In activating a solution a person tries to solve a problem and reduce tension accompanying the problem. Endler and Parker have distinguished (Szczepaniak, Strelau & Wrześniewski, 1996) three coping styles:

1. Task-oriented coping style (TOC) – a person makes an effort to solve a problem by means of cognitive conversions or attempts to change the situation (in our paper this style's equivalent is Active Coping)
2. Emotion-oriented coping style (EOC), in which a person acts to reduce uncomfortable emotions; it is characteristic of persons inclined to focus on themselves and their emotional experiences, to fantasize, and with a tendency towards wishful thinking. These actions are aimed at relieving emotional tension but sometimes they may lead to intensification of sadness and tension, and, paradoxically, increase stress.
3. Avoidance-oriented coping style (AOC) – it can have two forms:
 - activities aimed at distracting oneself from what causes stress, namely, engaging in substitute activities (ESA), for example, watching television, overeating, sleeping.

- searching for social support (SSS) – characteristic of persons who, when facing a stressful situation, are likely to avoid thinking about and experiencing the difficult situation.

So, coping is a process in which a person tries to meet specific external or internal demands connected with exhausting one's personal resources by cognitive, emotional, and behavioral means (Kuczyńska & Janda-Dębek, 2002).

Our paper analyzes anxiety (as a state and as a trait) intensity and stress-coping styles among children with bronchial asthma. Such wording of our aim leads to a number of questions: What percentage of the examined children have high anxiety intensity levels? Is there a statistically significant interrelation between a given anxiety intensity level and a corresponding coping style? What final conclusion does our research indicate in terms of therapeutic implications?

Material and methods

Our team's research is part of the statutory research into patients' life qualities with regard to their respiratory illnesses, conducted by the Institute of Psychology at the University of Wrocław, in co-operation with Wrocław Medical University. The research participants were 71 children (34 boys and 37 girls) suffering from bronchial asthma, taking part in a six-week sanatorium treatment program in Polanica Zdrój. The research was conducted individually by a psychologist working at the sanatorium. The researched group is homogenous in respect to age and the place of residence; children's ages vary from 12 to 15, with all of them coming from rural areas.

Two methods were used: State-Trait Anxiety Inventory for Children (STAIC) (by C.D. Spielberger, C.D. Edward, R.E.E. Lushene, J. Montouri, and D. Platzek) in the Polish adaptation by Sosnowski, Iwaniszczyk, and Spielberger (1987); and the *Jak Sobie Radzisz?* (*How Are You Coping?*) Scale by Juczyński and Ogińska-Bulik (2009). STAIC is used for examining anxiety as a state (C-1) resulting from circumstances, and from anxiety as a personality trait (C-2) occurring relatively constantly, regardless of the factors in an environment which activate anxiety and fear; it is to be applied in the examination of children. It comprises two parts, each of them containing 20 positions with answers on a three-point scale (1–2–3). The C-1 and C-2 scale results constitute the sum of points received for the answers in all positions. The minimal result possible to receive in each scale is 20, and the maximal – 60. The raw results can be ascribed to the 'Standard Ten' scores scale, where a sten score 1–3 means lack of anxiety, a sten score 4–6 is a sign of an average anxiety intensity (the norm), and a sten score 7–10 – a high anxiety intensity.

The HAYC (*How Are You Coping?*) scale is, referring to the paradigm of Lazarus and Folkman's research, used to examine situational and discretionary stress-coping styles employed by children. It constitutes two parts; in the first, the examinee is to take a stance towards a standard situation described in the instructions (the result received will inform about the discretionary style of coping with stress, namely, a strategy selection characteristic for an individual or a method for dealing with a difficult situation); and in the second part – towards a difficult situation experienced in the course of the preceding year described by himself/herself (the result received will inform about the situational style of coping used in a specific stress situation. The scale measures three strategies: Active Coping (AC), Focusing on Emotions (FE), and Search for Social Support (SSS). The strategies enumerated above are measured in every part of the Scale. Every part includes nine statements in the present tense (in the first part – discretionary) or in the past tense (in the second part – situational). The assessment is performed on a five-level scale, where each answer is given zero to four points; in the first part zero means 'almost never', and four – 'almost always', while in the second part zero means 'definitely no', and four – 'definitely yes'. In the discretionary part the result received includes frequency of applying a specific behavior pattern (strategy), whereas in the situational part it indicates how strong a given response (strategy) is.

Results

The STAIC examination allows one to receive a raw result reaching from 20 to 60 points, both in the first part, C-1, and in the second part, C-2. The average C-1 research result for the whole group equals 31.89, and the girls' result was lower. The result in C-2 for the whole group is 32.80, and the statistically significant differences between girls (35.20) and boys (30.32) should be mentioned. In the girls' group anxiety as a trait intensification is significantly higher.

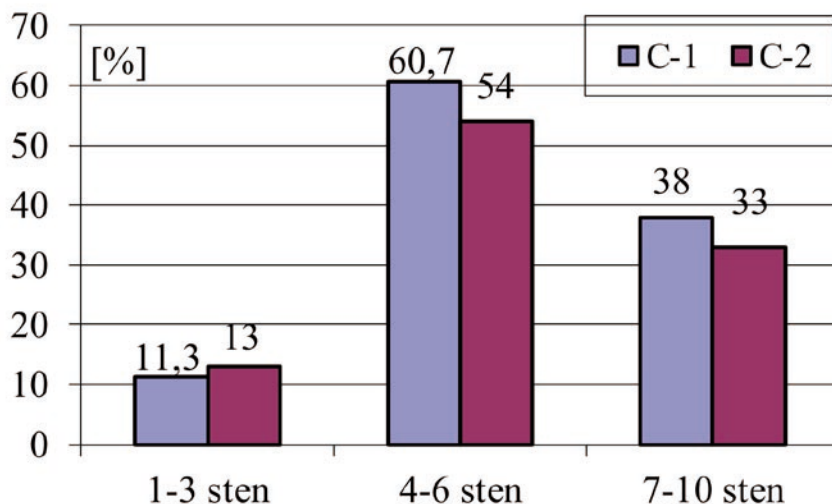
Table 1. Results of the average values in STAIC for the whole group and the subgroups of boys and girls.

	Sex	M	SD
C-1	Girls	31.29	8.50
	Boys	32.59	10.19
	All	31.89	9.19
C-2	Girls	35.20*	7.22
	Boys	30.32*	6.39
	All	32.80	7.21

* $t=2.966$ $p<0.01$

Distinction in numbers between anxiety as a state and anxiety as a trait (Figure 1) indicates that the smallest percentage of children are in the low values category (sten score 1–3) – 11.3% C-1 and 13% C-2, while more than half of the examined pupils achieve results in the average values category signifying a norm. A high proportion is characterized by a high level of anxiety as a state – 38% and anxiety as a trait – 33%.

Figure 1. The percentage of subjects achieving the values in C-1 and C-2 in sten intervals.



Results of coping styles were presented as weighted means (the points sum for each of the three strategies divided by the number of statements, namely, by three) in Table 2. Mean value comparisons in the discretionary coping style examination shows that highest values were given to the Active Coping strategy, next by Search for Social Support, and lastly by Focusing on Emotions. This order is visible in all participant groups as well as in the subgroups of boys and girls. It is worth pointing out that the AC strategy occurred most frequently in the boys' group (AC=1.9), where its result approximates the value two on the scale from zero (almost never) to four (almost always). The differences between the means statistics indicate that in difficult situations girls apply the Focusing on Emotions and Search for Social Support strategies more often than boys.

In the situational coping style the three strategies have similar average weighted values (not exceeding the value of two), the most marked is the AC strategy in the whole group and in the boys subgroup, while FE prevails in the girls subgroup. No statistically significant differences between boys and girls were observed while taking into consideration the application of these strategies.

Table 2. Mean values results on the HAYC Scale in the dispositional (1AC, 1FE, 1SSS) and situational (2AC, 2FE, 2SSS) coping style.

Sex		1AC	1FE	1SSS	2AC	2FE	2SSS
Girls	M	1.79	1.61**	1.62**	1.61	1.69	1.40
	SD	0.87	0.99	0.96	1.32	1.44	1.21
Boys	M	1.90	0.94*	1.14*	1.89	1.26	1.36
	SD	1.14	0.80	0.95	1.29	0.95	0.96
All	M	1.84	1.25	1.38	1.74	1.46	1.38
	SD	1.03	0.96	0.98	1.30	1.23	1.09

* $t(67)=3.079, p=.003$ ** $t(67)=2.102, p=.039$

Factor analysis using the Varimax rotation method was applied in order to conduct a more detailed analysis of results variance for the discretional and situational HAYC Scale. The results are presented in Table 3.

The three identified factors relate to three distinguished coping strategies (1f/FE, 2f/AC, 3f/SSS). The highest percentage of the results variability for the discretional coping style is explained by the Focusing on Emotions factor (1f/FE) – 31.7%, and the lowest – the Search for Social Support factor (3f/SSS) – 14.54%. All three factors explain the 63.34% total variance. The three factors in the situational version explain the 64.41% total variance, including the Focusing on Emotions factor (1f/FE) – 32.93%, the Active Coping factor (2f/AC) – 16.88%, and the Search for Social Support factor (3f/SSS) – 14.59%. In the light of the above analyses it follows that Focusing on Emotions shows the greatest significance in explaining the variance results from both HAYC Scale versions .

Table 3. Variance analysis results and coefficients of reliability values for specific strategies in the dispositional and situational coping style.

Styles	Factors	% variance	% cumulated	Cronbach's Alpha
Dispositional	1FE	31.67	31.67	0.67
	1AC	17.13	48.80	0.64
	1SSS	14.54	63.34	0.65
Situational	2FE	32.93	32.93	0.69
	2AC	16.88	49.81	0.71
	2SSS	14.59	64.41	0.54

Pearson's correlation coefficients indicate one bilateral relation significant from the statistic viewpoint; it refers to anxiety as a trait (C-2) and the coping strategy consisting in Focusing on Emotions (FE). The correlation coefficient value is very high $r(71)=.494, p<.001$, and it proves that in the entire group of children the increase in anxiety-as-a-trait intensity is accompanied by a more frequent application of the Focusing on Emotions

strategy in difficult situations. The indicated interrelation occurs only in the discretionary coping style (1FE). Other interrelations between anxiety as a trait (C-2) and the strategies available to an individual, both in the discretionary and situational coping styles (1AC, 1SSS, 2AC, 2FE, 2SSS), are very insignificant.

All received coefficients of correlation between anxiety as a state (C-1) and all strategies occurring in both examined coping styles are insignificant from the statistical viewpoint (tab. 4). It is only worth mentioning that in this case the Pearson's r coefficient values are negative (excepting the relation between C-1 and 2FE), which indicates a rising trend in anxiety as a state occurrence accompanied by a decreased occurrence in the described strategies in the discretionary as well as in the situational style of coping with difficult situations.

Table 4. Pearson's correlation coefficients between C-1, C-2 and stress coping strategies in the dispositional and situational coping styles for all children.

		1AC	1FE	1SSS	2AC	2FE	2SSS
C-1 (n=71)	r	-0.02	-0.04	-0.17	-0.02	0.09	-0.07
	p	0.859	0.755	0.148	0.864	0.432	0.563
C-2 (n=69)	r	0.20	0.49**	0.07	-0.07	0.06	-0.19
	p	0.091	0.000	0.550	0.581	0.606	0.124

** $p < 0.001$

In the girls group (Tab. 5) the discretionary coping style showed a statistically significant interrelation between anxiety as a trait and the Focusing on Emotions strategy. Correlation between anxiety as a state and the Focusing on Emotions strategy in the situational version of the scale approximates statistical significance (Tab. 5). In other cases correlation coefficients have a statistically low value.

Table 5. Pearson's correlation coefficients between C-1, C-2 and stress coping strategies in the dispositional and situational coping styles for girls.

		1AC	1FE	1SSS	2AC	2FE	2SSS
C-1 (n=37)	r	0.22	0.20	-0.08	0.25	0.32	0.06
	p	0.191	0.227	0.626	0.135	0.053	0.702
C-2 (n=35)	r	0.26	0.66**	0.02	-0.13	0.02	-0.26
	p	0.134	0.000	0.891	0.452	0.891	0.125

** $p < 0.001$

In the boys group (Tab. 6) no correlation coefficients were statistically significant. However, the negative direction between anxiety as a state (C-1) and coping strategies, occurring in both versions of the HAYC Scale is worth mentioning.

Table 6. Pearson's correlation coefficients between C-1, C-2 and stress coping strategies in the dispositional and situational coping styles for boys.

		1AC	1FE	1SSS	2AC	2FE	2SSS
C-1 (n=34)	r	-0.20	-0.26	-0.23	-0.28	-0.16	-0.22
	p	0.246	0.133	0.181	0.103	0.354	0.204
C-2 (n=34)	r	0.23	0.08	-0.06	0.08	-0.03	-0.12
	p	0.192	0.650	0.753	0.631	0.854	0.504

Discussion

It is noteworthy that 38% of the children have a high anxiety-as-a-trait intensity level (7–10 sten), and 33% have a very high anxiety-as-a-state intensity level. Other research programs into patients suffering from asthma confirm these findings; according to them more than 10% of examined patients show high anxiety intensity symptoms, as presented by, among others, Vamos and Kolbe (1999), Ciesielska-Kopacz (1992), and Yanxia et al. (2012). The high anxiety intensity level may be a consequence of failure to cope with problems and manifests itself psychopathologically, for example through bad moods or illnesses (Juczyński & Ogińska-Bulik, 2009). Moreover, anxiety as a state, which accompanies pulmonary disorders, may modify anxiety as a trait, which predisposes patients to responding with anxiety as a state more frequently (Talarowska et al., 2009).

Differences regarding sex were observed in the anxiety-as-a-trait occurrence pattern; girls scored higher than boys. This tendency was also noticed by other researchers, for instance Spielberger et al. (as cited in Jaworowska, 2005), Krain and Kendall (2000), Jacques and Mash (2012), who used the original version of STAIC and did not find differences regarding anxiety as a state between girls and boys but did find that girls' anxiety-as-a-trait results were higher than boys'. Similarly in Polish research (Sosnowski, Iwaniszczuk & Spielberger, 1987): there was no difference between sexes regarding anxiety as a state, but anxiety-as-a-trait intensity was significantly higher in the groups of 9- and 12-year-old girls. Polish normalization research (Jaworowska, 2005) into STAIC gave the following result: middle school (age 13–15) girls (33.00%) had significantly higher anxiety-as-a-trait results than boys (31.6%). In our research girls suffering from asthma show an even higher anxiety-as-a-trait level (35.0%) than those in the normalized group. Possibly, asthma, with which children are often diagnosed in early childhood, and which is related to numerous occasions when a child is separated from their family, causes high anxiety intensity levels, present in a child's life from its earliest stages (Stewart et al., 2011). Moreover, patients with bronchial asthma show signs of anxiety level pathologically higher than do healthy persons or other outpatient clinic patients (Sreedhar, 1989). Life is not stable when there is the necessity for frequent medical interventions or hospitalization, constant fear of expected shortness of breath. These factors are not conducive to feeling safe and

secure, safety being the fundamental factor influencing ill children and their families' quality of life. This was confirmed in the latest University of Illinois research⁴; it appears that regularity and predictability of, for example, regular meals with parents and their support are crucial factors for improving children with bronchial asthma's health and for reducing their anxiety. Children feel safer then, and the impression of being organized, which accompanies a meal with their family, brings relief.

Our paper indicates a connection between specific coping styles and anxiety intensity. It was proven that there is a relation between high anxiety-as-a-trait intensity level and the focusing on emotions strategy. Such interrelation is confirmed by the latest research into children with anxiety disorders results (Legerstee et al., 2010). According to this research, these children's coping styles consist mostly in thinking about negative life events in terms of a disaster (*catastrophizing*) and pondering on negative life events (*rumination*); children focus on these events' negative aspects more intensely than children from the control group. Apparently there is a positive correlation between *catastrophizing* and *rumination* strategies, and anxiety symptoms also among young people and adults (Garnefski et al., 2002). Results in our paper confirm a positive correlation between high anxiety intensity and focusing on emotions. This interrelation can be observed in the girls group suffering from asthma. It can be expected, therefore, that a more intense anxiety experience will trigger focusing on emotions strategy.

Our results indicate that the children use an active coping strategy more often in trying to find solutions to their problems. However, girls more frequently search for social support and focus on emotions. According to Band and Weisz (1988), stress related to medical procedures causes tendencies to cope using focusing on emotions strategy, whereas stress connected with social situations activates other strategies. It is so, because psychological factors influence the patients' efficiency in coping with illness (Pietras et al., 2009).

Our research results suggest that existing support and therapy programs for children with bronchial asthma ought to make use of diagnostic results which detail children's anxiety intensity levels and their stress coping styles, since there is a connection between the patients' psychological state and occurring asthma symptoms and treatment efficiency. Emotional factors are cited as having a major role in causing asthmatic symptoms to be more severe (hyperventilation and hypocapnia lead to bronchial tubes narrowing) (Talarowska et al., 2009). Similarly panic attacks, which occur to those more severely ill, can also cause breathing disorders, constituting one of the physiological components of phobias (Seligman, 2003).

⁴ <http://www.rynekzdrowia.pl/Nauka/Co-lagodzi-lek-u-dzieci-chorych-na-astme,16508,9.html> (na dzień 10.01.2016)

Numerous research results stating the necessity for child therapy that efficiently lowers anxiety have been published (Nowobilski, 2000). It appears that a therapy program selected for treatment should involve elements of relaxation, for it is more effective in reducing anxiety than a program without relaxation (Lamontagne, Mason, Hepworth, 1985). Also, since it is known that focusing on emotions strategy often increases tension and stress, therapy and education (in a systematic family therapy) will activate other coping strategies, for example looking for solutions, or at least will point out the benefits of searching for social support (Rathner & Messner, 1992). As has been cited, using various coping strategies leads to better psychological adaptation (Caplan, Bennetto & Weissberg, 1991). It also appears that physical activity in asthma therapy is not to be underestimated. Strunk et al. (1989) argue that asthmatic children's psychological adaptation correlates with their physical condition rather than with various health condition variables. Physical activity, underestimated until recently, is now one of the fundamental medical recommendations for such patients.

Conclusions:

Results of our research and discussion lead to the following conclusions:

1. Doctors in their initial contact with an asthmatic child should be aware of the necessity for examining the child's psychological condition.
2. Efficiency of coping strategies depends largely on psychological factors, for example on the anxiety intensity level.
3. Psychological examination of children with bronchial asthma's emotional condition seems to be indispensable .
4. Relaxation, parental instruction, and new trends in therapy – for instance, underscoring the role of physical activity in the treatment process – should be included in treating children and young people with a pulmonary disorder.

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