



Parents' from Poland coping with the illness of a child—Preliminary research. Cultural adaptation and evaluation of the psychometric properties of the coping health inventory for parents - polish version

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ABSTRACT

Purpose: The goal was to present preliminary research results on how parents cope with the illness of a child using the *Coping Health Inventory for Parents (CHIP)* after it had been culturally adapted and its psychometric properties evaluated.

Design and methods: Taking part in the study were 459 parents of children with asthma ($n = 230$) or suffering pain ($n = 229$).A.

Results: The content validity of the coefficient of variation ratio (CVR) for each item on the scale ranged from 0.84 to 1.00. Exploratory factor analysis by principal components method with Equamax rotation confirmed the three-factor structure of the test. The theoretical validity of the tool was confirmed by intercorrelation matrix analysis, and the criterion validity of the CHIP test was evaluated based on analysis of intergroup differences regarding individual measurements of coping by parents of children diagnosed with asthma but differentiated by need of regular medication. CHIP has high Cronbach alpha coefficients values: 0.80–0.86. Results indicate that the children's parents rate as moderately helpful the Support ($2.23, \pm 0.60$) and Family ($2.17, \pm 0.55$) styles. Parents rated the Medical style as least helpful in coping ($1.75, \pm 0.59$).

Conclusions: This study confirms both the accuracy and the reliability of the CHIP test, and the obtained coefficient values indicate that the tool can be used for individual and for scientific research.

Practice implications: The study shows that assessment of the manner of a parent's coping with the illness of a child is influenced by the child's gender and place of residence.

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Introduction

Coping, and research on specific coping behaviors that families use when they find themselves in a stressful situation such as a child's illness, have long been of interest to researchers. In this context coping is defined as an active process in which the existing resources of the family are used, but in which can also be observed the development of new resources and behaviors that will strengthen the family and alleviate/reduce the impact of stressors and facilitate a return to normal health (McCubbin, 1979). When a child is touched by illness or disability and requires care and support, it is the family, and in particular the parents, who bear the responsibility of helping the sick child (Aftyka, 2014; Almeida & Pereira, 2016). Illnesses have a physical, socio-economic, psychological and behavioral impact on the patients themselves, but also on their families, and therefore can lead to a reduction in quality

of life and functioning of the family (Toledano-Toledano et al., 2020). Complex treatments for children and adolescents associated with chronic disease can have a significant impact on families; their caregivers may feel overburdened; this can lead to a poorer quality of life and the emergence of health problems in them as well (Javalkar et al., 2017a, 2017b). As soon as a child is affected by chronic illness, it is essential to apply behaviors necessary to control the illness while at the same time recognizing the emotional, social, and environmental needs of the family (Patistea, 2005). Research shows that coping with a stressful situation or life-threatening illness contributes to the development of psychological stress within the family (Johnson & Onieka Mendoza, 2018). It is worth noting that coping has a protective function, and that families are an important asset in the treatment of a child as every day they are involved in their offspring's care, ensuring support in the broad sense—emotional, physical, spiritual, and psychological (Honea et al., 2008; Patistea, 2005). Applying active coping strategies leads to an increase in well-being and to a decrease in the level of stress being felt (Toledano-Toledano et al., 2020).

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Coping refers to a person's cognitive or behavioral efforts to deal with stressful situations (Lazarus & Folkman, 1984). It also refers to a family's strategies, patterns, and behaviors aimed at keeping and/or strengthening organization and stability within the family unit, at maintaining the emotional stability and well-being of the family members, at obtaining and/or using family and social resources to manage the situation, and at initiating efforts to resolve family problems caused by stressors (Charles R. Figley, 1989). *Coping Health Inventory for Parents* (CHIP) has been applied to evaluate coping behaviors of families affected by a child's illness (McCubbin et al., 1983) and has been used in countries around the world, including countries in Europe, Asia, North and South America, where it has demonstrated good psychometric values (Garro, 2011; Tvrdik et al., 2015; Gothwal et al., 2015; Almeida & Pereira, 2016; Senger et al., 2016; Gothwal et al., 2015; Lakkis et al., 2016; Bhattacharya et al., 2016; Kiami & Goodgold, 2017; Basso Zanon et al., 2017; Johnson & Onieka Mendoza, 2018; Toledano-Toledano et al., 2020; Miller et al., 2021). It is a research and clinical instrument, specifically designed to evaluate coping patterns of parents caring for seriously and/or chronically ill children, within the Resiliency Model. In essence this model describes the way in which stressful events accumulate and are filtered by strengths, resources, and coping strategies in the evolution of the family (Chapin, 2009; McCubbin et al., 1983). Despite the fact that research has shown an increase in the share of the male sex in the care of a chronically ill child, it is still women who are the main caregivers of the family and who take responsibility for most of the care of a sick child. (McCann et al., 2012; Khanna et al., 2015). In research results on coping known up to the present time, the greatest differences observed have been in fact between the sexes, and they consist of seeking support from the spouse and also from the whole family (women use this form of coping more often) (Toledano-Toledano et al., 2020) Among children and adolescents suffering from bronchial asthma, it has been shown that coping strategies such as religious practices and focusing on the problem have been useful to mothers in the care of their children (Perosa et al., 2013). In research by Honea et al., 2008 it was shown that mothers who experience greater self-efficacy feel less of a burden associated with the illness of a child, while a high level of feeling burdened on the part of a child's caregiver is statistically associated with negative effects on the child and on the caregiver. The psychological burden on parents can have very negative consequences and lead them to develop depression and anxiety, among other things (Javalkar et al., 2017a, 2017b). A proper use of coping strategies is helpful in caring for a sick child. The use of coping strategies has a positive effect on both children and caregivers; for this reason, there is a need to evaluate the coping strategies used in order to provide the child with holistic care, including his family and caregivers in the nursing process.

Material and methods

Purpose

The goal of this study was to present preliminary research results on how parents cope with the illness of a child (chronic asthma and acute pain) using the *Coping Health Inventory for Parents* after it was culturally adapted and its psychometric properties evaluated.

The choice of parents of children suffering a chronic disease or an acute condition was not accidental. Based on analysis of the literature, it was established that the process for parent's coping with the difficult situation of an illness lasting at least one year, and a short-term situation, often sudden, related to trauma or pain, are distinct from each other. Parents of children with asthma are included in planned educational programs on coping with the symptoms of this illness, participating in therapy, and the principles of monitoring the child's condition. On the other hand, parents of children suffering acute pain, due to the dynamic course of the health situation, do not have opportunity nor sufficient time for putting into use similar forms of influencing coping

methods regarding their child's illness. The children's parents participated voluntarily and anonymously in the study. They received a research toolkit for three days, during which time they were to select a suitable opportunity for answering the questions. As indicated by the parents' observations, this was most often at a time when their children were sleeping. All of the parents who participated in the study accompanied their children during the time in the hospital, staying with them in their hospital rooms.

Study setting

This research project is of an adaptive-diagnostic character. Taking part in the study were 459 parents of children with asthma ($n = 230$) or suffering from painful conditions ($n = 229$). Data collection was carried out at a children's hospital from February 2019, to February 2020. Inclusion criteria: having a child aged 12–17 years old; the child had to be ill with bronchial asthma or experiencing pain connected to trauma /injury (evaluated by the child on the Numerical Rating Scale [NRS] from 0 to 10) and hospitalization of the child; a parent's written consent to the study. A printed research toolkit was prepared, and a total of 850 questionnaire packets were distributed. The study used the *Coping Health Inventory for Parents* questionnaire by McCubbin, H.I., McCubbin, M.A., Patterson, J.M., Cauble, A.E., Wilson, L.R. & Warwick, W. (1983), who gave their consent for validation and use of the scale in Poland. The study followed the guidelines for translation and scale validation for maintaining idiomatic, semantic, and conceptual equivalence in a questionnaire (Sousa & Rojjanasrirat, 2011). The adaptation procedure for the scale was based on the translation and adaptation of instruments process recommended by the WHO (World Health Organization, 2020). Two independent language specialists made translations of the questionnaire content from English to Polish. The translations were then compared and inconsistencies that were noticed were discussed by the research team. In this way a unique version of the questionnaire was developed: the *Coping Health Inventory for Parents-Polish version*. In order to assess equivalence, the Polish questionnaire was translated back into English by another language expert, and then this reverse-translated version was compared with the original questionnaire. The competent judge method was used to evaluate the aptness of the questionnaire. The next step after receiving the finalized Polish version of the questionnaire was to carry out a preliminary test on a group of 30 parents, with the goal of assessing the quality of the translation and the possibility of using this tool in practice. This preliminary test made possible the introduction of minimal changes to the graphic aspects and content of the questionnaire, and for setting the time needed to complete the instrument at 15 min.

The research project was confirmed by the Bioethics Commission of the Medical University. The study observed the ethical principles of the Helsinki Declaration. Participation was voluntary and anonymous. All respondents were provided with information on the possibility of withdrawing from completing the survey at any time without the need to give a reason. All respondents received written and oral information about the purpose and course of the study and detailed information was provided on the study itself as well as on how to complete the survey form.

The return of the completed form was considered as informed consent to participate in the study. The research toolkits were not labeled in any way, in order to maintain full anonymity.

Data analysis

The IBM SPSS 26 program was used to perform statistical calculations. The characteristics of the study sample were developed on the basis of percentage distributions of the frequency of occurrence of qualitative data and on the basis of the measures of the mean, standard deviation, minimum and maximum of quantitative variables. Homogeneity of the studied groups was verified using the chi-square test and the

parametric t-Student test for independent data. The CHIP content accuracy was assessed on the basis of the CVR coefficient. The theoretical validity of the adapted test was estimated using exploratory factor analysis with Equamax rotation and Kaiser normalization, scree plot and the results of intercorrelation matrix analysis. Criterion validity was determined by analysis of intergroup differences. Cronbach's alpha coefficient and discriminant power measures were used to verify internal compliance of the tool. The shape of the distribution of the analyzed parameters was assessed using the Shapiro-Wilk and Kolmogorov-Smirnov tests. Correlation matrix analyses were conducted using Spearman's rho and tau-b Kendall coefficients, and the results interpreted with reference to the classification proposed by Guilford. The non-parametric Mann-Whitney *U* test was used to carry out intergroup comparisons, along with effect size estimate obtained based on the Glass coefficient ranking.

In the study a 5.0% statistical inference error ($p < 0.05$) was accepted as admissible for corroborating the presence of statistically significant differences or relationships.

Instruments

The *Coping Health Inventory for Parents (CHIP)* questionnaire was designed to evaluate parents and their response to family management when their child is seriously and/or chronically ill. CHIP is a self-reporting behavioral tool composed of a list of 45 specific behaviors/items. The parents were asked to indicate how helpful (on a scale of 0 to 3) each behavior is in their own concrete family situation. For each coping mechanism which the parent does not use, he/she gives the reason for not doing so: a) I do not use this method because we have decided not to use it; or, b) this coping method is not possible in our family/ it does not apply to us. The tool consists of three sub-scales: *Family* (Family Integration, Cooperation and An Optimistic Definition of the Situation), *Support* (Maintaining Social Support, Self Esteem, and Psychological Stability) and *Medical* (Understanding the Health Care Situation through Communicating with Other Parents and Consulting with the Health-Care Team). The Cronbach's alpha coefficients for the individual subscales in the original version of the questionnaire were: factor I: 0.79; factor II: 0.79 and factor III: 0.71 (McCubbin et al., 1983).

Characteristics of the participants

The study population consisted of 459 parents whose children are ill with asthma ($n = 230$; 50.1%) or suffering pain ($n = 229$; 49.9%). The respondents ranged in age from 30 to 59 years old, with an average age of close to 42. Among the parents both of children with asthma and of those suffering from pain, women were predominant. In the population studied, persons who have finished college and live in urban areas dominated. More than half of those researched have two children, every third parent is raising at least three sons or daughters, and more than a tenth of these men and women have one child. Most often the research participants reported a good or very good financial situation. Their children were between the ages of 12 and 17, averaging just under 15 years old. More than half of them were female. Close to half of the parents of the children under treatment for asthma stated that their son or daughter must take medication regularly, with almost two-fifths of respondents reporting that they use emergency pharmacotherapy in urgent situations. Severity of coughing, difficulty in breathing, wheezing, and shortness of breath in the children ranged from 1 (never) to 5 (more than once a week) points, and chest tightness and nocturnal asthma attacks ranged from 1 (never) to 4 (once a week) points. On average, the children experienced coughing and shortness of breath once per week, and had difficulty breathing, chest tightness, nocturnal asthma attacks, and wheezing once per month. In their turn, among the group of parents of children reporting painful symptoms, close to two fifths of the study participants blamed their son or daughter

for causing such symptoms to come about. Detailed characteristics of the trial group are presented in Table 1.

Results of the CHIP Questionnaire adaptation

For evaluating the content accuracy of the Polish language version, twelve qualified judges participated in the content validity assessment of the Polish version of the *Coping Health Inventory for Parents (CHIP)* who, using a defined universe, determined the degree to which each item in the scale was representative for them. The content validity coefficient (CVR) for each item was calculated based on their assessments. These assessments ranged from 0.84 to 1.00, which makes it possible to consider the items covered in the CHIP as accurate in terms of content.

For verifying the theoretical validity of the test, exploratory factor analysis was performed using the principal components method with Equamax rotation and Kaiser normalization of forty-five statements. In the final step of the analysis, the value for the Kaiser-Mayer-Olkin criterion was 0.73, which confirms the adequacy of the data selection. The result of the Bartlett sphericity test shows that the factor model is appropriate, $\chi^2 = 13,101.09$; $p = 0.001$.

The resulting data confirmed the three-factor structure of the test. The isolated dimensions explain a total of 50.2% of the variance. The values of the factor loadings in the selected scales are presented in Table 2. Table 2 omits items for which the factor loadings were lower than 0.4.

Of the forty-five CHIP test items, forty remain, as items that played a factor loading role on more than one scale were eliminated. The obtained data show that seventeen items constitute the first factor of Family, explaining 27.2% of the variance. The second factor, Support, consists of fifteen items and explains 13.0% of the variance. Meanwhile the third factor, Medical, consists of eight items and explains 10% of the variance.

The test structure has also been verified with a scree plot. The data obtained are presented in Chart 1.

In addition, the tool's theoretical accuracy was confirmed by analysis of the inter-correlation matrix between the various dimensions of the test. The obtained values of the coefficients are presented in Table 3.

The calculations performed show that there is a strong, directly proportional relationship between the parents' belief that family integration, cooperation, and positive attitude regarding the situation being experienced are helpful remedies, and their perception in these terms of striving to understand their circumstances through communicating with other parents and consulting with their health-care team. There was also a strong co-existence of the conviction that obtaining this kind of help from family members and medical staff is an effective way of coping, and perceiving the benefits of focusing on maintaining social support, self-esteem and psychological stability. In its turn, assessment of the usefulness of family integration, cooperation and an optimistic approach to the situation shows a reasonably positive relationship with the perception of coping by striving to maintain the level of received social support, self-esteem, and emotional stability.

Validity of the CHIP test criteria was evaluated based on analysis of intergroup differences in the individual coping dimensions for parents whose children diagnosed with asthma differed from each other as regards need for regular medication. Results of the comparative analysis are presented in Table 4.

In accordance with the assumption that had been accepted, strong effects were noted from systematic medication of the child for parents to cope with the illness through: family integration, cooperation, and a positive attitude towards the situation; striving to understand it through communicating with other parents and consulting with the health care-team; and by focusing on maintaining the level of social support received as well as self-esteem and emotional stability.

The analysis shows that parents of children regularly receiving medication more often find each of the above-mentioned methods more helpful in their situation than mothers and fathers caring for children who do not require regular pharmacotherapy.

Table 1
Characteristics of the participants.

Variable		Group				Comparison		Total	
		asthma		pain		χ^2	p	n	%
		n	%	n	%				
Parent's sex	female	132	57.4	129	56.3	0.05	0.819	261	56.9
	male	98	42.6	100	43.7			198	43.1
Education	vocational	32	13.9	42	18.3	1.98	0.373	74	16.1
	secondary	85	37.0	75	32.8			160	34.9
	higher	113	49.1	112	48.9			225	49.0
Place of residence	rural	93	40.4	110	48.0	2.69	0.101	203	44.2
	city	137	59.6	119	52.0			256	55.8
Number of children	one child	27	11.8	26	11.4	0.67	0.717	53	11.6
	two children	124	54.4	133	58.1			257	56.2
	at least three children	77	33.8	70	30.6			147	32.2
Economic status	(very) good	123	53.5	109	47.6	1.861	0.394	232	50.5
	satisfactory	96	41.7	105	45.9			201	43.8
	insufficient	11	4.8	15	6.6			26	5.7
Child's sex	female	122	53.0	122	53.3	0.01	0.960	244	53.2
	male	108	47.0	107	46.7			215	46.8
Takes medication regularly	no	120	52.0	–	–	–	–	–	–
	yes	110	48.0	–	–	–	–	–	–
Takes medication in emergency situations	no	140	61.0	–	–	–	–	–	–
	yes	90	39.0	–	–	–	–	–	–
Blames the child for the occurrence of pain	no	–	–	146	63.9	–	–	–	–
	yes	–	–	83	36.1	–	–	–	–
		M	SD	M	SD	t	p	M	SD
Parent's age		41.70	6.76	41.78	5.16	0.13	0.897	41.74	5.99
Child's age		14.90	1.72	14.44	1.93	1.56	0.124	14.81	1.76
Age of child at asthma diagnosis		6.81	3.45	–	–	–	–	–	–
Asthma symptoms	cough	3.12	1.39	–	–	–	–	–	–
	difficulty breathing	2.45	1.36	–	–	–	–	–	–
	chest tightness piersiowej	1.87	0.94	–	–	–	–	–	–
	nocturnal asthma attacks	1.59	0.76	–	–	–	–	–	–
	wheezing	1.93	1.06	–	–	–	–	–	–
	shortness of breath	2.50	1.24	–	–	–	–	–	–

The data obtained, then, make it possible to confirm the criterion accuracy of the adopted CHIP questionnaire.

In the next stage of the analysis, the reliability of the Polish-language version of the test was verified. The values of the internal consistency coefficients and the discriminatory powers of the items that make up the scales identified in CHIP are presented in Table 5.

The obtained data indicate that CHIP has high values of Cronbach's alpha coefficients, as well as satisfactory discriminatory power for all items constituting individual factors. This allows us to confirm the reliability of the three-factor version of the questionnaire.

Taking into account that the adaptation is confirmed in both the relevance and reliability of the test, it must be said that the tool can be used in individual and scientific research. Each of the three CHIP scales is assessed separately. The results are calculated by summing up the points for the answers to the statements included in the individual factors. By dividing the sum of the points of each dimension by the number of items it contains, the results characterize the degree of suitability of each of the three ways (Family, Support, Medical) parents cope with the situation of the child's illness, where 3 means that a given remedy is assessed as extremely helpful; 2 - moderately helpful; 1 - minimally helpful; 0 - not helpful.

Preliminary test results

The descriptive statistics values together with the measures of the shape of the distribution of scales making up the Polish version of the CHIP Questionnaire are presented in Table 6.

The scores of each of the three CHIP scales under consideration ranged from 1.00 (not helpful) to 3.00 (extremely helpful) points. On average, the parents saw family integration, cooperation, and a positive attitude to the situation; seeking to understand it through communication with other parents and consultation with the health care-team; and

striving to maintain a level of social support, self-esteem, and psychological stability as moderately helpful in coping with the child's illness.

The Kolmogorov-Smirnov test results indicate that the dimensions under consideration differ in shape from the Gaussian curve. Both the distribution of the Family scale and the Support and Medical factors are right-skewed and leptokurtic.

Results of comparisons of parents' coping with their child's illness in terms of selected sociodemographic and medical features are presented in Table 7.

The analysis showed statistically significant weak effects of the child's gender for Family and Support, and for place of residence for Support and Medical.

The data obtained show that respondents raising daughters, as compared to the parents of sons, less often consider family integration, cooperation, and a positive attitude towards the child's illness, or seeking understanding of the situation through communicating with other parents and consulting with their healthcare team, as helpful to their situation.

Furthermore, participants from rural areas, as compared to city residents, more often believe that it is helpful to seek understanding of their situation through communicating with other parents and consulting with the healthcare team, as is striving to maintain the level of social support received, self-esteem, and emotional stability.

At the same time, statistically significant effects were not confirmed regarding the child's [specific] illness, parent's gender, the child being blamed for his or her pain/blaming the child for causing the pain, for example by using sharp tools, or the use of emergency medications for the Family, Support and Medical subscales, nor for the child's gender for Medical or place of residence for Family, which means that these factors do not differentiate the respondents regarding the abovementioned ways of coping with the illness of their son or daughter.

Table 2
Factor loadings of the CHIP questionnaire.

Test item number		Factor 1 Family	Factor 2 Support	Factor 3 Medical
original version	adapted version			
3	3	0.85		
11	9	0.82		
2	2	0.78		
1	1	0.75		
9	7	0.74		
7	5	0.73		
13	11	0.69		
10	8	0.67		
18	16	0.65		
15	13	0.65		
19	17	0.63		
16	14	0.62		
5	4	0.60		
12	10	0.58		
14	12	0.52		
17	15	0.49		
8	6	0.43		
21	19		0.80	
25	23		0.70	
28	26		0.67	
31	27		0.67	
36	31		0.66	
23	21		0.65	
26	24		0.63	
37	32		0.63	
35	30		0.62	
33	29		0.62	
27	25		0.61	
20	18		0.60	
32	28		0.59	
22	20		0.55	
24	22		0.40	
40	35			0.88
41	36			0.88
39	34			0.84
44	39			0.75
43	38			0.73
38	33			0.56
42	37			0.40
45	40			0.40

Analysis results of correlation matrix of the CHIP Inventory dimensions, and selected sociodemographic and medical factors, are presented in Table 8.

On the basis of these calculations, it was found that there are weak positive relationships between Family and the ages of parent and child, and weak negative relationships between this variable and the severity of asthma symptoms in children such as coughing, breathing difficulties, nocturnal attacks, and wheezing.

Furthermore, Support is weakly in direct proportion to the ages of parent and child, financial situation, age of the child when diagnosed with asthma, and also moderately inversely proportional to nocturnal asthma attacks and wheezing in the child, and slightly negative as regards severity of the child's illness, coughing, and difficulty in breathing.

On the other hand, Medical correlates positively with the child's age, weakly directly proportional to the parent's age, financial situation, age of the child when diagnosed with asthma, and somewhat negatively with illness, wheezing, and shortness of breath.

Beyond this, there were no statistically significant links between Family, Support and Medical and other sociodemographic and medical factors.

Discussion

This study evaluated the psychometric features of CHIP in the Polish population. The Polish version of CHIP, like the original version, consists

of three factors (Family, Support, and Medical), which include coping patterns such as maintaining family integration; obtaining social support; cooperation and an optimistic approach to the situation; self-esteem; understanding the situation in the medical context, communicating with other parents of sick children, and talking to medical staff. The CHIP list items went from forty-five to forty in the Polish version as some items serving as factor loadings for more than one scale (possibly due to the group under study or to cultural context) were eliminated. This was seen also by researchers in other countries: for example in the Spanish version, CHIP contained only 16 items that were classified into five factors (Toledano-Toledano et al., 2020), and in the Iranian version, factor analysis made it possible to identify a 13-element, three-factor model that recreated the concept of the dimensional structure of the original CHIP instrument (Aguilar-Vafaie, 2008; Toledano-Toledano et al., 2020). On the other hand, analysis of the CHIP scale structure in the Indian version using the Rasch method revealed high psychometric values for two revised subscales: "maintaining family integration" and the original "maintaining social support." A subscale of "understanding the healthcare situation" should be the subject of further research (Gothwal et al., 2015). In the Portuguese version of the questionnaire item number 18 was excluded, so in that translation the questionnaire has 44 items (Almeida & Pereira, 2016). In the original (McCubbin et al., 1983) version the first Factor I consisted of 19 items touching on maintaining family integration, cooperation, and an optimistic definition of the situation; Factor II consisted of 18 items; Factor III was composed of 8 indicators (McCubbin et al., 1983). From the data obtained, it follows that seventeen items constitute the first factor, Family; the second factor, Support, consists of 15 items, and the third factor, Medical, consists of 8 items.

The Cronbach's alpha reliability coefficient in all three factors in our study totaled from 0.80 to 0.86, which means very high reliability, and these results place slightly higher than those presented by McCubbin et al., 1983. The Iranian cultural and psychometric adaptation of CHIP also showed high reliability (alpha Cronbach 0.85) (Ghorbani et al., 2020), as do the Italian version of CHIP, for which the reliability for factors took on Cronbach's alpha values from 0.70 to 0.88 (Ionio et al., 2018); the Sri Lankan version with similar reliability for Factors I-III of 0.81, 0.84 and 0.78, respectively (Padeniya et al., 2020); and the 45-item, three-factor version from Brazil (van der Mheen et al., 2018).

Our research indicated that a strong directly proportionate relationship between the conviction of parents that the coping patterns in the Family [Factor] are a helpful remedy, and perceiving in these categories a striving to understand the existing circumstances through communicating with other parents and consulting with the healthcare team. A fairly constant tendency in the mothers and fathers was to cope using family resources (Clever et al., 2020; Hoseinzadeh et al., 2019). Mothers use social support to the least extent in coping with a child's illness (Clever et al., 2020; Hoseinzadeh et al., 2019).

Research presents various strategies of parents in coping with an ill child. The adaptive nature of parents' coping with the chronic illness of a child allows them to avoid psychopathological problems which could adversely affect social relationships associated with childcare and collaboration with medical staff (Zanon et al., 2017). Latino parents dealt with a child's asthma by actively trying to understand the condition, by carrying out activities with family members, and maintaining an optimistic outlook. Variables concerning children and family were not significantly linked to the parents' use of coping patterns (Garro, 2011).

Research by Han, H. et al. on a group of mothers of children with cancer indicates that their most helpful coping strategy was associated with an optimistic point of view of the situation, and maintaining family integrity (Han et al., 2009; Padeniya et al., 2020). Frequent use of family integration (CHIP-D FAM) and maintenance of social support (CHIP-D SUP), as well greater valuing of two partners coping, were significantly linked to less fear among mothers regarding progression of hematological cancer (Clever et al., 2020).

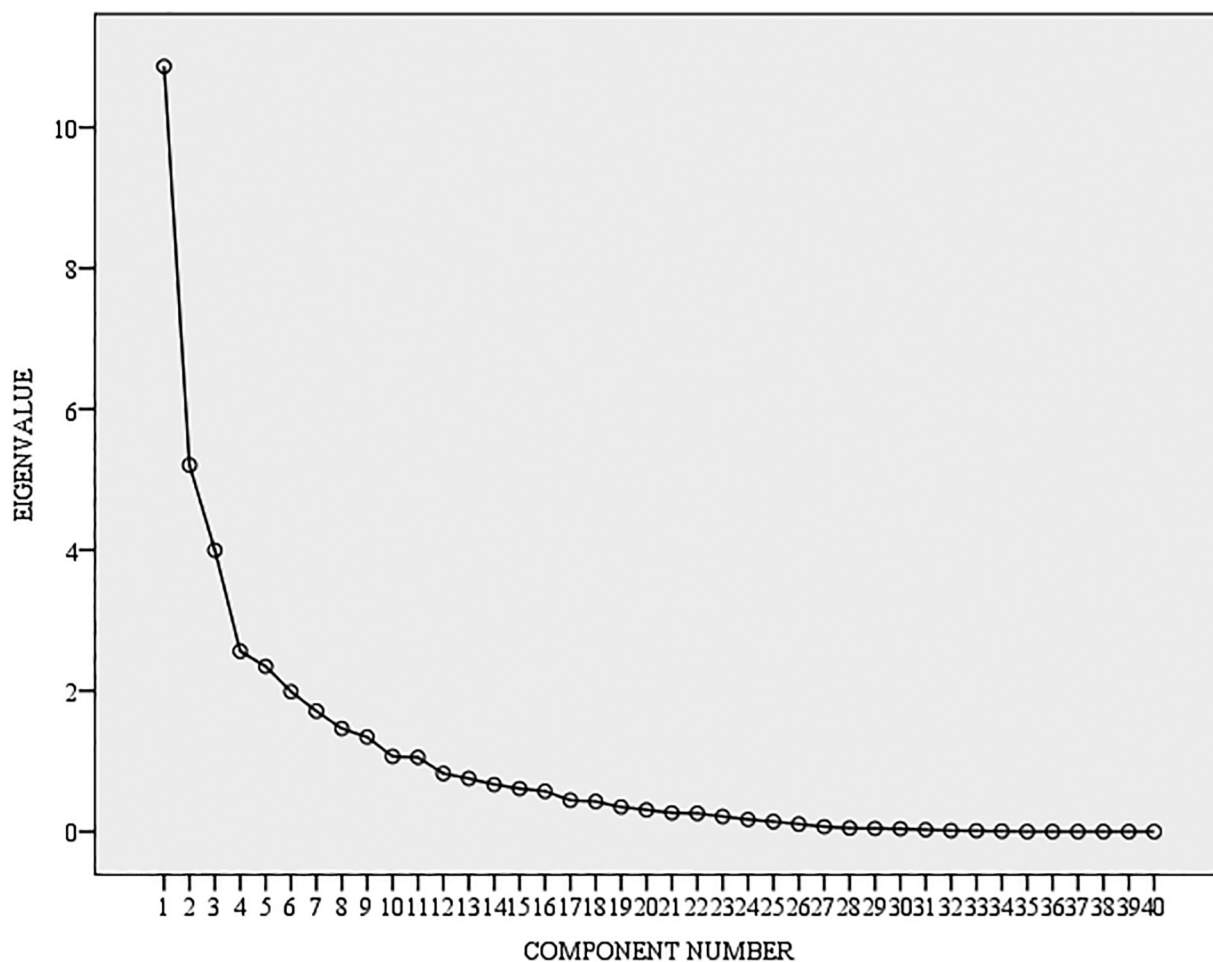


Chart 1. Scree chart of the factor structure of the CHIP Questionnaire.

Analysis showed somewhat statistically significant effects of the child's gender for Family and Support, as well as for place of residence for Support and Medical. When considering the coping strategies of mothers of children suffering from cancer in the light of the children's sociodemographic characteristics, male children in Sri Lanka had significantly greater medical and social support than female children ($p = 0.012$ and $p = 0.038$, respectively). Furthermore, recovering children had greater family, social, and medical support in comparison with critically ill patients (Padeniya et al., 2020). This research indicates that parents of daughters find the coping patterns included in the Family, Support, and Medical factors helpful in their situation, in contrast to parents raising sons. Mothers used coping strategies more frequently and more successfully than did fathers; at the same time the greatest correlation was observed when both parents used religious coping strategies (Goldbeck, 2001). Furthermore, Goldbeck compared the coping strategies used by parents of children suffering from cancer with the strategies used by parents in a control group and the parents in the cancer group used a significantly more withdrawing coping style, along with optimism and information-seeking, while using a coping style based

on social support much less (Goldbeck, 2001). A study conducted in Mexico demonstrated the importance of religion and family in coping with a child's illness (Moral De La Rubia & Miaja Ávila, 2015). In research by Perosa in 2013, on a group of mothers of children with asthma, there was a high percentage of mothers using religious strategies, especially in cases of more severe clinical conditions, and mothers who felt powerless (Perosa et al., 2013). Faith in God was also the most important means for coping for Iranian parents of children suffering from cancer (Ghorbani et al., 2020). In China, unpredictability was associated negatively with parents' ability to cope ($r = -0.225; p < 0.05$) (He et al., 2016). Parents regarded "family members working together as a unit" as the most helpful coping strategy, and "allowing myself to be angry" as the least helpful (Peng et al., 2017).

In turn, parents of Latin children suffering from bronchial asthma coped with the child's disease by attempting to understand the child's condition, collaborating with other family members, and maintaining an optimistic outlook (Garro, 2011). Based on calculations performed,

Table 3 Values of correlation coefficients among the dimensions of the CHIP Questionnaire.

Skala CHIP	Support	Medical
Family	0.64****	0.45****
Medical	0.65****	-

Designations: **** - correlation significant at the level of 0.001.

Table 4 Comparison of coping of parents of children with different pharmacological needs.

Scale	Medication				Comparison		
	non-systematic		systematic		Z	p	r_g
	M	SD	M	SD			
Family	3.45	0.44	3.87	0.60	4.34	0.001	- 0.70
Support	2.28	0.60	3.97	0.51	3.77	0.001	- 2.25
Medical	1.51	0.43	1.86	0.58	4.27	0.001	- 0.60

Table 5
Internal consistency coefficients and CHIP discriminatory power values.

Scale	Cronbach's alpha	Test item number in the adapted version	Item discriminatory power	Cronbach's alpha after deleting an item
Family	0.86	1	0.62	0.85
		2	0.59	0.85
		3	0.20	0.87
		4	0.26	0.87
		5	0.37	0.86
		6	0.63	0.85
		7	0.54	0.86
		8	0.77	0.84
		9	0.83	0.84
		10	0.49	0.86
		11	0.57	0.85
		12	0.53	0.86
		13	0.65	0.85
		14	0.55	0.85
		15	0.25	0.87
		16	0.41	0.86
		Support	0.83	17
18	0.64			0.81
19	0.61			0.82
20	0.25			0.85
21	0.37			0.84
22	0.35			0.83
23	0.61			0.81
24	0.54			0.82
25	0.77			0.80
26	0.85			0.79
27	0.52			0.82
28	0.65			0.81
29	0.53			0.82
Medical	0.80	30	0.44	0.82
		31	0.21	0.84
		32	0.20	0.85
		33	0.56	0.77
		34	0.58	0.77
		35	0.77	0.73
		36	0.70	0.75
		37	0.54	0.78
		38	0.45	0.79
		39	0.28	0.2
		40	0.31	0.81

it was found that there are relationships between Family, Support and Medical and the age of the parent and child, as well as relationships of these variables with the severity of asthma symptoms in children such as coughing, difficulty in breathing, nocturnal attacks of the disease, and wheezing. A significant negative relationship was found between psychological distress of parents of children with cancer and coping in terms of the family-based and social support (CHIP) factors (Lakkis et al., 2016).

Paediatric patients feel pain with the same—or even greater—intensity as adults (Cramton & Gruchala, 2012). Research shows the key role of the mother's coping in the child's quality of life and the functioning of the family (Sales et al., 2008). A child's hospital stay affects the whole family; furthermore, research results confirm the significance of the parents' presence in the child's ability to cope with his or her illness (Salmela et al., 2010). It is worth noting that the pain felt by the child affects himself and the family, but also noteworthy that the presence of a

Table 6
Descriptive statistics and shape measures of the distribution scales of the CHIP questionnaire.

Scale	M	SD	Min.	Max.	K-S	p	A[SE]	K[SE]
Family	2.17	0.55	1.00	3.00	1.91	0.001	0.89[0.11]	3.14[0.23]
Support	2.23	0.60	1.00	3.00	2.57	0.001	1.11[0.11]	2.79[0.28]
Medical	1.75	0.59	1.00	3.00	1.68	0.001	1.64[0.11]	6.67[0.23]

guardian with the child, for example during a hospital stay, and a well-functioning family, have a positive effect on how the child copes with painful ailments (Pölkki et al., 2003).

In the case of other illnesses as well, a parent's coping style related to the development of relationships, taking measures to promote self-esteem and to a less negative orientation towards problem-solving, were important factors in predicting the occurrence of stress in the child's caregiver. The behavioral and cognitive traits of the caregiver influence his adaptation to the situation (Blucker et al., 2011). Mothers and fathers of infants with phenylketonuria obtained lower results in coping with that disease than parents of healthy children in the CHIP-II subscale. In addition, fathers of infants with phenylketonuria had significantly lower results in the CHIP-III subscale than did fathers of healthy children (Ionio et al., 2018).

The results obtained are helpful in understanding which coping strategies are used in Poland by parents whose children have been affected by illness. Moreover, as the research shows, parents responding to the behaviors contained in the questionnaire which focus on their well-being promote reflection and self-awareness about the stress being experienced and on coping, which strengthens their resilience and sense of caring (Starks et al., 2016). Research by Hoseinzadeh et al. has shown that group therapy interventions based on resiliency are an effective coping strategy for mothers of children with cancer, as demonstrated by each of the three factors (Hoseinzadeh et al., 2019). Future research should include social, psychological, and intrafamilial adaptation to the stressful situation of a child's illness strategies for coping, taking the cultural and family context into account.

Evidence application to practice

The illness of a child always affects the functioning of his/her family, which is an important resource in treating the child. Proper assessment of how the family copes with a child's illness is helpful in planning and implementing the nursing care process for the sick child.

Nurses could play a more active role in identifying the resources and the levels of how parents cope with the illness of a child, and in encouraging parents to stay optimistic and promoting a change in their perception of a threat (the illness) to one of opportunity. How the parents cope with any illness of a child influences the sick child, therefore appropriate assessment will make it possible for nurses and other healthcare professionals to take steps to help the child and his/her parents adapt to the illness and maintain the well-being of the family (Senger et al., 2016) and reduce stress (Kiami & Goodgold, 2017). This tool can be used to identify difficulties the family has in coping, and to properly guide parents and help them in the difficult situation in which they find themselves. Coping Pattern I: Family Integration, Cooperation and An Optimistic Definition of the Situation increased after the use of a structured care plan (PC) for parents of children with Prader-Willi Syndrome (PWS), PC ($p = 0.042$). Women and men preferred different coping patterns before and after the PC (Tvrdik et al., 2015). Coping Pattern II: Maintaining Social Support, Self Esteem and Psychological Stability went up after using Healing Hearts and Home© (HHH©) (Miller et al., 2021).

Deliberate coping strategies can contribute to better treatment outcomes and the child's and parents' adaptation to living with the illness, and can help nurses provide care that is responsive to the illness, family-centered and conducive to the child's health outcomes.

Strengths and limitations

The factor analysis of the CHIP Polish version questionnaire provided a structure in the Polish language which was both culturally and statistically satisfactory. The Cronbach's alpha reliability coefficient for the three isolated factors in the questionnaire is high. All of the list items have either a high or very high discriminatory power. Preliminary results confirm the credibility and accuracy of CHIP for future use in this

Table 7
Comparison of how parents cope with a child's illness in terms of selected sociodemographic and medical features.

Scale	Illness				Comparison			Parent's sex				Comparison			Child's sex				Comparison		
	Asthma		Pain		Z	p	r _g	Female		Male		Z	p	r _g	Female		Male		Z	p	r _g
	M	SD	M	SD				M	SD	M	SD				M	SD	M	SD			
Family	2.10	0.48	2.24	0.61	1.54	0.124	–	2.17	0.56	2.17	0.56	0.37	0.712	–	2.12	0.55	2.23	0.55	2.86	0.004	–0.20
Support	2.19	0.59	2.28	0.61	1.66	0.098	–	2.24	0.61	2.15	0.61	0.77	0.444	–	2.17	0.62	2.30	0.62	2.82	0.006	–0.21
Medical	1.76	2.88	1.75	0.61	0.64	0.524	–	1.75	0.60	1.78	0.60	0.85	0.398	–	1.76	0.57	1.75	0.57	0.60	0.549	–

Scale	Place of Residence				Comparison			Blaming the child for causing the pain				Comparison			Medication in emergency situations				Comparison		
	Rural		Urban		Z	p	r _g	Yes		No		Z	p	r _g	Yes		No		Z	p	r _g
	M	SD	M	SD				M	SD	M	SD				M	SD	M	SD			
Family	2.18	0.48	2.16	0.61	1.87	0.062	–	2.18	0.48	2.16	0.61	0.92	0.357	–	2.06	0.50	2.11	0.48	0.55	0.584	–
Support	2.28	0.48	2.19	0.68	2.92	0.004	0.13	2.28	0.48	2.19	0.68	0.78	0.438	–	2.05	0.57	2.22	0.57	1.89	0.059	–
Medical	1.82	0.58	1.70	0.59	2.34	0.02	0.20	1.82	0.58	1.70	0.59	0.57	0.572	–	1.64	0.51	1.78	0.57	1.05	0.295	–

Table 8
Values of correlation coefficients between the dimensions of parents' coping with the child's disease and selected sociodemographic and medical factors.

CHIP Scale	Family	Support	Medical
Parent's age	0.18****	0.20****	0.24****
Child's age	0.23****	0.24****	0.32****
Number of children	0.02	0.01	–0.04
Financial situation	0.07	0.13**	0.16****
Age of child at diagnosis of asthma	0.01	0.25****	0.28****
Cough	–0.18***	–0.16****	–0.30****
Difficulty in breathing	–0.27****	–0.21****	–0.15*
Chest tightness	0.01	–0.05	0.02
Nocturnal asthma attacks	–0.15*	–0.39****	–0.30****
Wheezing	–0.17**	–0.33****	–0.27****
Shortness of breath	–0.09	–0.01	–0.14*

Designations: **** - correlation significant at the level of 0.001; *** - correlation significant at the level of 0.005; ** - correlation significant at the level of 0.01; * - correlation significant at the level of 0.05.

country. It is worthwhile to recall certain limitations to our research. Convenience was used in recruiting participants, so the sample consisted of parents of children with various health problems, levels of dependency, and care needs. This sampling error could have had an impact on the results.

Most of the parents participating in the study were mothers, which is connected to the fact that it is mothers who are most often engaged in the medical care of children. There were difficulties in gathering a study group which were linked to the difficult situation in which parents find themselves when a child is ill and thus not agreeing to participate in a study. In order to overcome this limitation and to obtain more accurate information, the researcher endeavored to provide the questionnaire to parents when they were mentally ready to complete the questionnaire without any stress. In addition, the large number of list items could reduce precision, so sampling was performed at the best possible time, as determined by the participants. An additional limitation to generalizing the results is that the respondents represented only one region of Poland.

Conclusions

1. The study confirms the three-factor structure of the *Coping Health Inventory for Parents* (CHIP) Polish version as well as acceptable reliability of its measurements.
2. The data obtained make it possible to confirm the criterion validity of the adapted CHIP questionnaire as well as the theoretical validity of the tool, which was confirmed by analysis of the inter-correlation matrix between the individual dimensions of the test.
3. This study shows that there is a strong, directly proportional relationship between parents' conviction that family integration,

cooperation, and a positive attitude to the situation is a helpful remedy and the perception in these categories of striving to understand the existing circumstances through communicating with other parents and consulting with the healthcare team.

4. The use of familial resources, collaboration, and an optimistic view of the situation are related to a satisfactory financial situation.
5. Systematic medication of a child has a positive effect on parents' coping with his/her illness, using coping patterns included in the factors Family, Support, and Medical.

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