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The sense of body boundaries – subjective determinants and implications for body self-relation in people with psychosomatic illnesses

Abstract

This article seeks to explore the determinants of the sense of body boundaries and its implications for body self- relation in psychosomatic patients – patients with irritable bowel syndrome (IBS) as well as psoriasis and atopic dermatitis. Stepwise regression analysis and paths analysis were carried out. The most significant condition affecting the strength of the sense of body boundaries among IBS patients is their sensitivity to the violation of self- boundaries in the dimension of the social self. Likewise, among patients with skin diseases, the most important factor is their style of cognitive functioning (field independence). Furthermore, both similarities and differences have been found in the groups involved in the research in terms of determinants of the sense of body boundaries, as well as in comparison with the results from healthy patients. The results which were obtained indicated that the greater the strength of the sense of body boundaries in IBS patients, the greater its positive impact on the assessment of the patients' own health, their physical attractiveness and comfort from touch, in a similar way to that in healthy people. As far as patients with psoriasis and atopic dermatitis are concerned, the sense of body boundaries was revealed to have a positive impact on the level of health orientation: active involvement with either maintaining or improving the health condition.

Keywords

Sense of body boundaries, body self- relation, irritable bowel syndrome, psoriasis, atopic dermatitis, health condition

Streszczenie

Dążono do poznania uwarunkowań poczucia granic ciała i jego następstw dla relacji z ciałem u osób chorych psychosomatycznie - z zespołem jelita nadwrażliwego oraz z łuszczycą i atopowym zapaleniem skóry. Wykonano analizę regresji metodą krokową i analizę ścieżek. U osób z IBS najważniejszym uwarunkowaniem siły poczucia granic ciała jest wrażliwość na naruszenie granic Ja w wymia-

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rze Ja społecznego, a u osób z chorobami skóry – styl funkcjonowania poznawczego (niezależność od pola). Ponadto stwierdzono, że w badanych grupach istnieją zarówno podobieństwa, jak i różnice w zakresie uwarunkowań poczucia granic ciała, także w zestawieniu z wynikami osób zdrowych. Uzyskane rezultaty wskazały, że im większa jest siła poczucia granic ciała u osób z IBS, tym większy jest jej pozytywny wpływ na ocenę własnego zdrowia i atrakcyjności fizycznej, a także komfortu w dotyku, podobnie jak u osób zdrowych. U osób z łuszczycą i atopowym zapaleniem skóry poczucie granic ciała okazało się istotnie wpływać na poziom zorientowania na zdrowie: aktywne zaangażowanie w utrzymanie lub poprawę kondycji zdrowotnej.

Słowa kluczowe

poczucie granic ciała, relacja z ciałem, zespół jelita nadwrażliwego, łuszczyca, atopowe zapalenie skóry, kondycja zdrowotna

Introduction

The aim of this study was to recognise the subjective determinants of the sense of body boundaries and to establish its after-effects on the health condition of psychosomatic patients.

The sense of body boundaries is variously defined in literature (Krzewska, Dolińska-Zygmunt, 2012; Krzewska, 2015). Its definitions seem to be well integrated in the barrier concept (Fisher and Cleveland, 1956; 1958; Fisher,1960; Cleveland, 1960; Fisher, 1963; 1970; S.Fisher and R.Fisher, 1964). According to these authors, the sense of body boundaries is the cognitively-emotional experience of one's own bodily surface in terms of barrier and permeability . The sense of barrier is a relatively constant sense of a person's own physical separateness from the environment, while the sense of permeability is a sense of physical vulnerability to violation, connected with fear for one's own physical safety. The barrier dimension as well as the dimension of permeability of boundaries, based on the intensity in each individual case, are the components of the strength of the sense of body boundaries.[3]

Psycho-dynamic-developmental concepts indicate the fundamental importance of the sense of body boundaries on a person's personality and the growth of their identity (Krueger, 1989, 1990, 2002; Kowalik, 2003, Allport, 1998, James, 1890, Grotstein, 1980, after: Sakson-Obada 2009). This fact also implies the considerable role played by the sense of body boundaries in the shaping of a health condition. (Fisher, Cleveland, 1958; Fisher, 1971, Krzewska, Dolińska-Zygmunt, 2012; Krzewska, Ruda, Rymaszewska, 2012).

In accordance with psycho-dynamic concepts, the sense of body boundaries is conditioned by interoception, which means the body signals' perception is the basis of one's

[3] The stronger the sense of the barrier of body boundaries (separateness from the environment) and the weaker the sense of permeability (susceptibility to violation), the greater the power of the sense of body boundaries.

own feeling as a separate unit from the environment. This feeling increases with a parent's touch (Krueger 1989, 2002; Anzieu, 1979; Meloney, 1957, after: Sakson-Obada, 2007). Fisher and Cleveland (1958) postulated that people differ in the intensity of their perception of the signals from the surface and from the inside of the body. That results in the concentration of attention on those body areas in which the availability of experience is more intense (Fisher and Cleveland, 1958, Reich, 1949, after: Fisher, 1960). The references to the degree of attention on the body's surface has also been analysed by several Polish authors (Wolak, 1989; Wycisk, 2004; Sakson-Obada, 2009).

The ability to differentiate between one's own body and the environment has been considered in terms of field dependence / independence – the style in which the individual receives and processes incoming information. The cognitive style that is independent from the field means the ease of the differentiation of the field fragments against the totality, whereas, the style that is dependent on the field means the difficulty in maintening of the portion of the field (e.g. an object or target) against the background of the totality (Witkin, Goodenough, Oltman, 1979, Matczak, 2000; Nosal, 1990; Strelau, 2006, after: Bednarek, Truszczyński, 2010). The research presents the idea that the degree of independence from the field can be manifested by the style of experiencing one's own body as an object of a separate environment[4] (Witkin, 1968); however, in this understanding, it seems to be ambiguously related to the sense of body boundaries from Fisher's point of view (the barrier aspect) (Fisher, 1970; Fisher, 1990, Shontz 1969). Equivalently to the sense of body boundaries in Fisher's and Cleveland's viewpoint (1956), independence from the field seems to be connected with some personality traits and health issues (Witkin, 1968).

It creates the impression that the sense of body boundaries may be dependent on individual differences in the need for cognitive closure (Webster, Kruglansky, 1994, after: Kossowska, Hanusz, Trejtowicz, 2012), which means the tendency to search for clear and certain knowledge. People with a high need for cognitive closure are featured as decided, orderly and solid; they prefer predictability and they usually do not tolerate ambiguity. Moreover, they can be called as intellectually "closed". The disposition described above should be manifested by the way of experiencing the body: as an integral whole or an open, ambiguous space.

Another psychological phenomenon that is related to the sense of body boundaries as analysed by Fisher and Cleveland (1956) is the level of sensitivity to the violation of self- boundaries (Burris and Rempel, 2004, after: Jaśkiewicz and Drat-Ruszczak, 2011): the recognition and protection of one's own boundaries in bodily, social and territorial-symbolic terms.

[4] Together with independence from the field, some changes occur, e.g. the ability of the people being examined to determine the position of the body in a dark room – based on signals coming from the body.

After-effects of the sense of body boundaries

The literature indicates that the sense of body boundaries adjusts the relation of an individual to his/her own body (Krueger, 2002ab, Mirucka, 2003ab, Kowalik, 2003; Sakson-Obada, 2009; Sakson-Obada, Mirucka, 2013) and carries significant implications for a human's health condition (Krzewska, Dolińska-Zygmunt, 2013). A weakened sense of body boundaries is described, among others, in schizophrenia-related disorders (Rohricht, Priebe, 2001,2002), personality disorders (like borderline) (Sakson-Obada, 2003), among victims of trauma and emotional violence (Wycisk, 2004) and also among obese people (Geiger, Magyar, 1978).

Fisher and Cleveland (1956, 1958) illustrated that the strength of the sense of body boundaries allows for the prediction of symptoms of psychosomatic disease[5] with regard to where they occur in the body (on the surface or inside). In the research by the authors mentioned above, patients with dermatitis had higher barrier indicators and, at the same time, lower permeability indicators, compared to patients with peptic ulcers (Fisher and Cleveland, 1954, after: Fisher, Cleveland, 1956). Other authors have not confirmed these findings among the people they examined who had psychosomatic diseases in the areas of the skin, the stomach and the urogenital system (Eigenbrode and Shipman, 1960; Hirt and Kurtz, 1969). Certain data suggests that the sense of body boundaries can be considered in categories of health potential, due to the fact that its greater strength is associated with a greater ability to control emotions (Brodie, 1959 after: Fisher, 1963); and furthermore with a greater ability to cope with stress (Fisher, 1963).

The literature indicates that the sense of body boundaries may be an important condition for health self-assessment (Fisher and Cleveland, 1958; Fisher, 1963; Krzewska, Ruda and Rymaszewska, 2012), physical fitness (Fisher, 1970) and attractiveness (Wycisk, 2004; Mirucka, 2006; Sakson-Obada, 2009; Krzewska, 2012, Ruda, Krzewska, Rymaszewska, Koczanowicz, 2013), as well as involvement in these spheres.

It has been frequently claimed that the sense of body boundaries has a role in building a sense of comfort in touch. This role is noted in issues of both health and illness (Wycisk, 2004; Sakson-Obada, 2009; Krzewska, 2012; Ruda, Krzewska, Rymaszewska, Koczanowicz, 2013). Patients with an increased sense of boundaries, in Fisher's understanding, are attributed with having a high degree of openness to communication, a more advanced tendency to interact (Fisher and Cleveland, 1971) and greater ease of interactive functioning as well as spontaneous expression (Fisher, 1963; Ramer, after: Fisher, 1963).

[5] The authors do not give one accepted definition of psychosomatic disease.

Materials and Methods

Based on the literature, two major research problems were formulated [6]:

1. What are the conditions affecting the sense of body boundaries among the patients with psychosomatic diseases: irritable bowel syndrome, psoriasis and atopic dermatitis?

   Among determinants of the sense of body boundaries the following variables were analysed: style of cognitive functioning, concentration of attention on the body surface, insensitivity of proprioception, need of cognitive closure, sensitivity to the violation of boundaries

2. What are the after-effects of the sense of body boundaries for body relations among psychosomatically[7] ill patients with irritable bowel syndrome, psoriasis and atopic dermatitis?

   The following implications of the sense of body boundaries for body self- relation were analysed: appearance evaluation and orientation, physical fitness evaluation and orientation, health evaluation and orientation (health care), disease orientation (sensitivity to the symptoms of the illness)

Variables and methods[8,9] for the main research problems were presented in charts 1 and 2.

[6] The results of the patients will be discussed in relation to earlier studies conducted among healthy people – because of the amplitude of the latter studies, it was decided not to present them in the present study. However, they have been widely discussed in a separate publication (Krzewska, Dolińska-Zygmunt, 2016).

[7] The following thesis is focused on those psychosomatic illnesses which are manifested by two arbitrarily defined types of symptoms: symptoms involving the external parts of the body (due to their function, the symptoms that remain in continuous, direct physical contact with the outside world or are subjected to the will) or symptoms involving internal parts of the body (that are not subjected to the will and do not remain in continuous, direct physical contact with the outside world). Attention was concentrated on psychosomatic illnesses in the field of dermatology and gastroenterology. For practical reasons (unambiguous recognition, the availability of patients), atopic skin dermatitis, psoriasis and irritable bowel syndrome were chosen. The following diseases were selected because of the similarities in their unclear and multiple etiology (genetics are mentioned, among others). The diseases which were analysed also do not have a clearly psychogenic etiology. The clear influence of psychological factors on the course of these illnesses is stressed, so that they are described as the psychosomatic diseases.

[8] Variable: the sense of body boundaries can be both dependent and independent – depending on the stage of the research.

[9] The description of the author's research tools can be found in the publication by Krzewska and Dolińska-Zygmunt, 2016

Chart 1. Dependent variables

Variable	Indicator	Tool
The sense of body boundaries: – The strength of the sense of body boundaries – Barrier – Permeability	The answers in the questionnaire – the numerical results	The Sense of Body Boundaries Questionnaire (Kwestionariusz Poczucia Granic Ciała) **KPGC** (Krzewska I., Dolińska-Zygmunt G., 2013)
Comfort in touch	The answers in the questionnaire – the numerical results	The Body Investment Scale, **BIS**, (Orbach I., Mikulincer M., 1998, trans. B. Lewandowska) sub-scale: comfort from touch
The relation with one's own body: – Appearance evaluation – Appearance orientation – Physical fitness evaluation – Physical fitness orientation – Health evaluation – Health orientation (health care) – Disease orientation (sensitivity to the symptoms of the illness)	The answers in the questionnaire – the numerical results	Multidimensional Body Self Relations Questionnaire, **MBSRQ,** Cash, 2000, trans. Schier and others 2009, sub-scales in accordance with the particular variables

Chart 2. Independent variables

Variable	Indicator	Implement
The sense of body boundaries: – The strength of the sense of body boundaries – the global result – Barrier – Permeability	The answers in the questionnaire – the numerical results	The Sense of Body Boundaries Questionnaire (Kwestionariusz Poczucia Granic Ciała) **KPGC** (Krzewska, Dolińska-Zygmunt, 2013)
The style of cognitive functioning according to Witkin – the range of independence from the field	The amount of correctly performed test tasks in a given time period	Group Embedded Figure Test, **GEFT** (Witkin H.A., Oltman P.K., Raskin E., Karp S.A.,1971, 2002).
The concentration of attention on the body surface	The percentage participation of answers of an "external" type in the procedure of asking the examined people about the body parts which they think about more frequently thanothers.	The Scale of Paying Attention to the Body Surface (Skala Koncentracji Uwagi na Powierzchni Ciała) **SKUPC**, the author's method
The insensitivity of proprioception	The amount of the spontaneously reported experiences from the body by the examined person in the situation of a short period of relaxation	The report of the Signals from the Body (Raport Sygnałów z Ciała) **RSC** (the author's method, based on Fisher, 1965; Sakson-Obada, 2009)

Variable	Indicator	Implement
The need of cognitive closure: – the intensity of the need of cognitive closure, – order preference, – predictability preference, – intolerance of ambiguity, – mental closeness, – decisiveness	The answers in the questionnaire – the numerical results	Need for Cognitive Closure Scale (Skala Potrzeby Poznawczego Domknięcia) **SPPD** – shorten version (Kossowska, Hanusz, Trejtowicz, 2012, based on: Kruglansky, Webster, 1994)
The sensitivity to the violation of the boundaries: – global self- result – corporal self: discomfort in the situation of the violation of the body boundaries – social self: discomfort in the situation of the risk of social rejection – symbolic-territorial self: discomfort in the situation of the loss of the environment characters connected with the sense of identity	The answers in the questionnaire – the numerical results	**Amoebic Self Scale**, **SNaG** (Burris, Rempel, 2004, Polish adaptation Jaśkiewicz, Drat-Ruszczak, 2011)

The subjects who were examined:

People with psychosomatic diseases with symptoms in the area of the digestive system: diagnosed with IBS (Irritable Bowel Syndrome) (Chart 3,4)

People with psychosomatic diseases with symptoms on the skin : diagnosed with psoriasis and atopic dermatitis (Chart 3,4).

Chart 3. The descriptive statistics for the participants of the study

	Irritable Bowel Syndrome	Psoriasis, Atopic Skin Dermatitis
N	56	56
Age range	21-65	19-65
Age average	38,17	39,31
Women	46	48
Men	10	8

Chart 4. The descriptive statistics for the people examined

		N	Average	Standard deviation
The strength of the sense of body boundaries	irritable bowel syndrome	56	67,34	14,32
	psoriasis and atopic skin dermatitis	56	66,07	13,18
Barrier	irritable bowel syndrome	56	24,98	5,28
	psoriasis and atopic skin dermatitis	56	24,43	4,68
Permeability	irritable bowel syndrome	56	42,36	9,87
	psoriasis and atopic skin dermatitis	56	41,63	9,82

Psychosomatically ill patients with dermatological symptoms were collected through the following: private clinics of general dermatology and aesthetic dermatology, public dermatological clinics (National Health Fund), the Dermatological Unit in Dermatology and Venereology Clinic (Medical University), contact with fellow patients and their acquaintances, the Lower Silesia Association for Psoriasis.

Psychosomatically ill patients with symptoms in the area of the digestive system were collected/contacted through Internet forums, gastroenterological clinics in Wrocław, and hospital wards, including among others: the Gastroenterology and Hepatology Clinic at the Medical University in Wrocław, the Gastroenterological Ward in the J. Gromkowski Hospital in Wrocław.

The patients were qualified to be in the ward due to the recognition of the following illnesses: irritable bowel syndrome, psoriasis or atopic dermatitis, which had been diagnosed at least one year before the examination. As far as possible the recognition was objectified through access to the medical records and conversations with the attending doctors. In rare cases, information about the recognition of the condition was personally provided by the patients. The research has a psychological character, which is why the severity of the diseases was not rated. Instead of this, the subjective feeling of illness among the patients participating in the research and the patients identification with the problem was evaluated. Not only patients with actual symptoms of the diseases were qualified to take part in the research, but also those who could expect a relapse due to the chronic nature of the disease. The Commission on the Ethics of Scientific Research at the Psychology Institute agreed to t this research being carried out.

Statistical analysis methods

Statistical analysis was conducted using the SPSS 21 and Statistics 6, 10: Descriptive statistics (numbers, average, standard deviation), multiple regression model, structural equation modelling – paths analysis.

Procedure

The people invited to take part in the research were familiar with the aim and the course of the study; then they gave their informed consent to participate in the study. The research had an individual character.

Results[10]

The study of the conditions of the sense of body boundaries among the psychosomatically ill patients started from establishing opportunities to predict the strength of the sense of body boundaries and its dimension intensity: barrier and permeability. Linear regression stepwise analysis was conducted [11].

In the case of patients suffering from **irritable bowel syndrome**, the variance of the strength of the **sense of body boundaries** is explained in 29,9% (adjusted R^2) by the variability of the following significant predictors: sensitivity to the violation of self- boundaries in the dimension of the social self and the need for cognitive closure in the dimension of order preference as well as predictability preference (chart 5). The sensitivity of self- boundaries in the dimension of the social self is the stronger predictor, while the predictability preference is the weakest, as evidenced by the β values (chart 6). Based on increased sensitivity to the violation of self -boundaries in the dimension of the social self, the decrease in the strength of the sense of body boundaries can be predicted. The

[10] The value of the β factors for the dimension: **permeability** should be interpreted in accordance with the principle of inverse (because of the reversed punctuation key). That means that due to the increase in the intensity of variables with a negative value of β factor, we can predict the increase of permeability intensity and also its decrease – based on β with a positive value. For the strength of the sense of body boundaries and the dimension of barrier, the interpretation of the value of β factors is standard.

[11] Firstly, the stand out observations that could have a negative impact on the results of the regression analysis were diagnosed and deleted. The stand out observations were recognised as those whose value of Mahalanobis distance, after introducing all of the predictors to the model, exceeded the critical level of 29,588. It is a critical value of chi^2 distribution for 10 degrees of freedom on the significance level $p \leq 0{,}001$. |Together, 10 explaining variables were entered; then the stepwise regression analysis method saved only those in which the β factor was crucial on the $p < 0{,}05$ level. In each of the following regression studies, there were the following variables: the intensity of proprioception, the style of cognitive functioning (independence from the field), the need for cognitive closure in the dimensions: preference of order, preference of predictability, intolerance of ambiguity, mental closeness, decisiveness; moreover, the sensitivity to the violation of the "I" boundaries in three dimensions: the bodily I, the social I and the symbolical I. It was decided not to include the results obtained in the range of concentration on the surface of the body as well as the age/life period, since as shown in Pearson's correlation analysis and tests of the significance of the differences, the variables do not considerably bind with the sense of body boundaries and its dimensions. Furthermore, the global results in the range of the need of cognitive closure and sensitivity to the "I" boundaries, were also not included, in order to reduce the phenomenon of the colinearity of predictors.

strength of the sense of body boundaries increases with the growth of the intensity of the need for cognitive closure in the dimension of order preference; whereas, it decreases in the dimension of permeability preference.

In the group of people suffering from **atopic dermatitis and psoriasis**, there are the following predictors of the strength of the **sense of body boundaries**: the style of cognitive functioning (independence from the field) and the dimensions of the need for cognitive closure: decisiveness and preference of predictability. Based on the increase of their values, the growth of the strength of the sense of body boundaries can be predicted. In this group, the predictors mentioned explain more than half of the variances of the overall score of the strength of the sense of body boundaries (chart 5). The predictors have been approached from the strongest to the weakest (chart 6).

Chart 5. The summary of the model of regression analysis for the strength of the sense of body boundaries in the groups marked out on the basis of their state of health. Irritable bowel syndrome N=56, psoriasis, atopic skin dermatitis N=56

	R	Adjusted R^2	Standard error of estimation	ANOVA			
				F	df1	df2	Significance F
Irritable bowel syndrome	0,581	0,299	11,989	8,82	3	52	**0,000**
Psoriasis, atopic skin dermatitis	0,733	0,511	9,217	20,17	3	52	**0,000**

Predictors – irritable bowel syndrome: (Constant), the sensitivity to the violation of the boundaries of social self (social SnaG), the preference of order, the preference of predictability – the dimensions of the need of cognitive closure
Predictors – psoriasis, atopic skin dermatitis: (Constant), the style of cognitive functioning – independence from the field (GEFT), decisiveness, the preference of predictability – the dimensions of the need of cognitive closure

Chart 6. The standardised and non-standardised coefficients of the regression analysis for the strength of the sense of body boundaries in the groups marked out on the basis of their state of health . Irritable bowel syndrome (IBS) N=56, psoriasis, atopic skin dermatitis N=56

		Non-standardized coefficients		Standardized coefficients β	t	Significance
		B	Standard error			
Irritable bowel syndrome	(Constant)	74,594	12,016		6,208	**0,000**
	Social SnaG	−0,810	0,220	−0,421	−3,683	**0,001**
	Order preference	2,743	0,812	0,395	3,378	**0,001**
	Predictability preference	−1,947	0,718	−0,321	−2,710	**0,009**

		Non-standardized coefficients		Standardized coefficients β	t	Significance
		B	Standard error			
Psoriasis, atopic skin dermatitis	(Constant)	9,089	8,035		1,131	0,263
	GEFT	2,359	0,458	0,497	5,155	**0,000**
	Decisiveness	1,128	0,238	0,448	4,729	**0,000**
	Predictability preference	1,749	0,517	0,325	3,381	**0,001**

Denotations: decisiveness, order preference, predictability preference – the dimensions of the need of cognitive closure. GEFT – the style of cognitive functioning (independence from the field), social SNaG – the sensitivity to the violation of the boundaries of social self

In the group of people suffering from **irritable bowel syndrome**, the sense of **barrier** predictors are the dimensions of the need for cognitive closure: predictability and order preference. Together, they explain 21,8% of the variability of the barrier results (chart 7). The predictability preference is a stronger predictor than the order preference (chart 8). Moreover, the intensity of the barrier dimension decreases with the increase in predictability preference; however, it increases when there is growth in the intensity of the order preference.

Taking into consideration the people suffering from the **atopic skin dermatitis and psoriasis**, the following predictors are crucial: the need for cognitive closure in the dimension of decisiveness and predictability preference, as well as the style of cognitive functioning (independence from the field). The increase in the value of these variables gives an opportunity to predict the growth of the intensity of the body boundaries barrier. These predictors explain about 40,1% of the variance of the barrier feeling (chart 7), wherein the strongest predictor is the need for cognitive closure in the decisiveness dimension, while the weakest is the style of cognitive functioning (chart 8).

Chart 7. The summary of the model of the regression analysis for the barrier dimension in the groups singled out on the basis of their state of health. Irritable bowel syndrome N=56, psoriasis, atopic skin dermatitis N=56

	R	Adjusted R^2	Standard error of estimation	ANOVA			
				F	df1	df2	Significance F
Irritable bowel syndrome	0,496	0,218	4,672	8,66	2	53	**0,001**
Psoriasis, atopic skin dermatitis	0,659	0,401	3,620	13,29	3	52	**0,000**

Predictors – irritable bowel syndrome: (Constant), predictability preference, order preference – the dimensions of the need of cognitive closure
Predictors – skin: (Constant), decisiveness, predictability preference – the dimensions of the need of cognitive closure, the style of cognitive functioning – independence from the field (GEFT)

Chart 8. The standardised and non-standardised coefficients of the regression analysis for the barrier dimension in the groups singled out on the basis of their state of health . Irritable bowel syndrome N=56, psoriasis, atopic skin dermatitis N=56

		Non-standardized coefficients		Standardized coefficients β	t	Significance
		B	Standard error			
Irritable bowel syndrome	(Constant)	25,875	4,059		6,375	**0,000**
	Predictability preference	−1,032	0,277	−0,461	−3,732	**0,000**
	Order preference	0,869	0,316	0,339	2,746	**0,008**
Psoriasis, Atopic skin dermatitis	(Constant)	5,640	3,155		1,788	0,080
	Decisiveness	0,906	0,180	0,538	5,039	**0,000**
	GEFT	0,194	0,094	0,217	2,071	**0,043**
	Predictability preference	0,748	0,203	0,392	3,681	**0,001**

Denotations: decisiveness, order preference, predictability preference – the dimensions of the need of cognitive closure. GEFT – the style of cognitive functioning (independence from the field), SNaG social – the sensitivity to the violation of the boundaries of social self.

Lastly, an attempt was made to make a prediction about the permeability dimension among the patients taking part in the research.

In the group of people suffering from **irritable bowel syndrome**, the percentage of explained variability of permeability dimension is 32,8% (chart 9). This variance is clarified by sensitivity to the violation of self- boundaries in the dimension of the social self (the stronger predictor) and the need of cognitive closure in the dimension of ordinance preference (chart 10). Based on the growth of the intensity of sensitivity to the violation of self-boundaries in the dimension of the social self, an increase in the intensity of permeability can be predicted. Moreover, based on the growth of the order preference, a decrease can be foreseen as well.

Considering the patients with **skin diseases**, the percentage of the explained variance of the permeability dimension is as high as 49,6% (chart 9). The crucial predictors in this group are the following (from the strongest to the weakest): the style of cognitive functioning (independence from the field), the need for cognitive closure in the dimensions: decisiveness as well as predictability preference and intensity of proprioception (chart 10). Depending on the increase in the intensity of proprioception, we can speculate that there will be growth in the intensity of permeability; then, based on the increase of the intensity of other variables – its decrease.

Chart 9. The summary of the model of the regression analysis for the permeability dimension in the groups marked out on the basis of their state of health . Irritable bowel syndrome (IBS) N=56, psoriasis, atopic skin dermatitis N=56

	R	Adjusted R^2	Standard error of estimation	ANOVA			
				F	df1	df2	Significance F
Irritable bowel syndrome	0,594	0,328	8,089	14,45	2	53	**0,000**
Psoriasis, Atopic skin dermatitis	0,730	0,496	6,971	14,53	4	51	**0,000**

Predictors – IBS: (Constant), the sensitivity to the violation of the boundaries of social self (social SNaG)., the preference of order – the dimension of the need of cognitive closure

Predictors – skin: (Constant), the style of cognitive functioning – independence from the field (GEFT), decisiveness, predictability preference – the dimensions of the need of cognitive closure, the intensity of proprioception (IP)

Chart 10. The standardised and non-standardised coefficients of the regression analysis of the dimension of permeability in the groups singled out on the basis of their state of health . Irritable bowel syndrome (IBS) N=56, psoriasis, atopic skin dermatitis N=56

		Non-standardized coefficients		Standardized coefficients β	t	Significance
		B	Standard error			
Irritable bowel syndrome	(Constant)	38,085	7,061		5,394	**0,000**
	social SNaG	−0,635	0,147	−0,479	−4,331	**0,000**
	Order preference	1,620	0,529	0,338	3,061	**0,003**
Psoriasis, Atopic skin dermatitis	(Constant)	15,813	8,067		1,960	0,055
	decisiveness	1,137	0,373	0,322	3,049	**0,004**
	GEFT	0,953	0,181	0,508	5,275	**0,000**
	Predictability preference	1,006	0,391	0,251	2,572	**0,013**
	IP	−0,124	0,053	−0,242	−2,335	**0,024**

Denotations: decisiveness, order preference – the dimensions of the need of cognitive closure, GEFT – the style of cognitive functioning (independence from the field),

social SNaG – the sensitivity to the violation of the boundaries of social self, IP- intensity of proprioception

The next stage of the studies endeavoured to establish the psychological factors that are significant in the genesis of the sense of body boundaries among the psychosomatically ill patients. An attempt was also made to specify in which aspects of body self- relation the role of the sense of body boundaries is the strongest (in the area of body self- relation the following aspects were analysed: evaluation and orientation towards physical attractiveness, evaluation and orientation towards physical fitness, evaluation and orientation

towards health as well as orientation towards illness; moreover, the comfort drawn from touch was taken into account). The following procedure was carried out for this purpose: the theoretical model of the conditions and aftermaths of the sense of body boundaries was tested by modelling the structural equations – through path analysis[12]. The model of the best matching indicators revealed the cause and effect variables for the strength of the sense of body boundaries.

The correlations between the sense of body boundaries as well as the variables defining its conditions and after-effects were taken into account in the selection of variables for particular models. The theoretical premises were recognised as the basis of the plan.

The path analysis in the sample of patients with irritable bowel syndrome

The function discrepancies method GLS→ML was applied, without the assumed standardisation while adding the obtained correlations between the variables to the analysis.

The model that was obtained fitted well with the data: $chi^2(15) = 20{,}91$; $p = 0{,}140$.

Considering the patients suffering from irritable bowel syndrome, the model which fitted best to the data (diagram 1) is the one according to which the strength of the sense of body boundaries is conditioned by sensitivity to the violation of self- boundaries in the social dimension and order preference (the dimension of the need for cognitive closure). In accordance with the resulting model, the aftermaths of the sense of body boundaries among the patients with irritable bowel syndrome are revealed in such areas of body self- relation as: evaluation of attractiveness as well as evaluation of health and comfort in touch, similar to the healthy people. Furthermore, the chosen model indicates that among the patients with IBS, the after-effect of the sense of body boundaries is the evaluation of physical condition.

[12] The research was conducted on the groups identical with the previous ones in terms of numbers. Due to the lack of the data (which were so far replaced with the average values), some of the cases were substituted with the results of the new members (5 cases in the skin illnesses and 6 cases in the irritable bowel syndrome diseases).

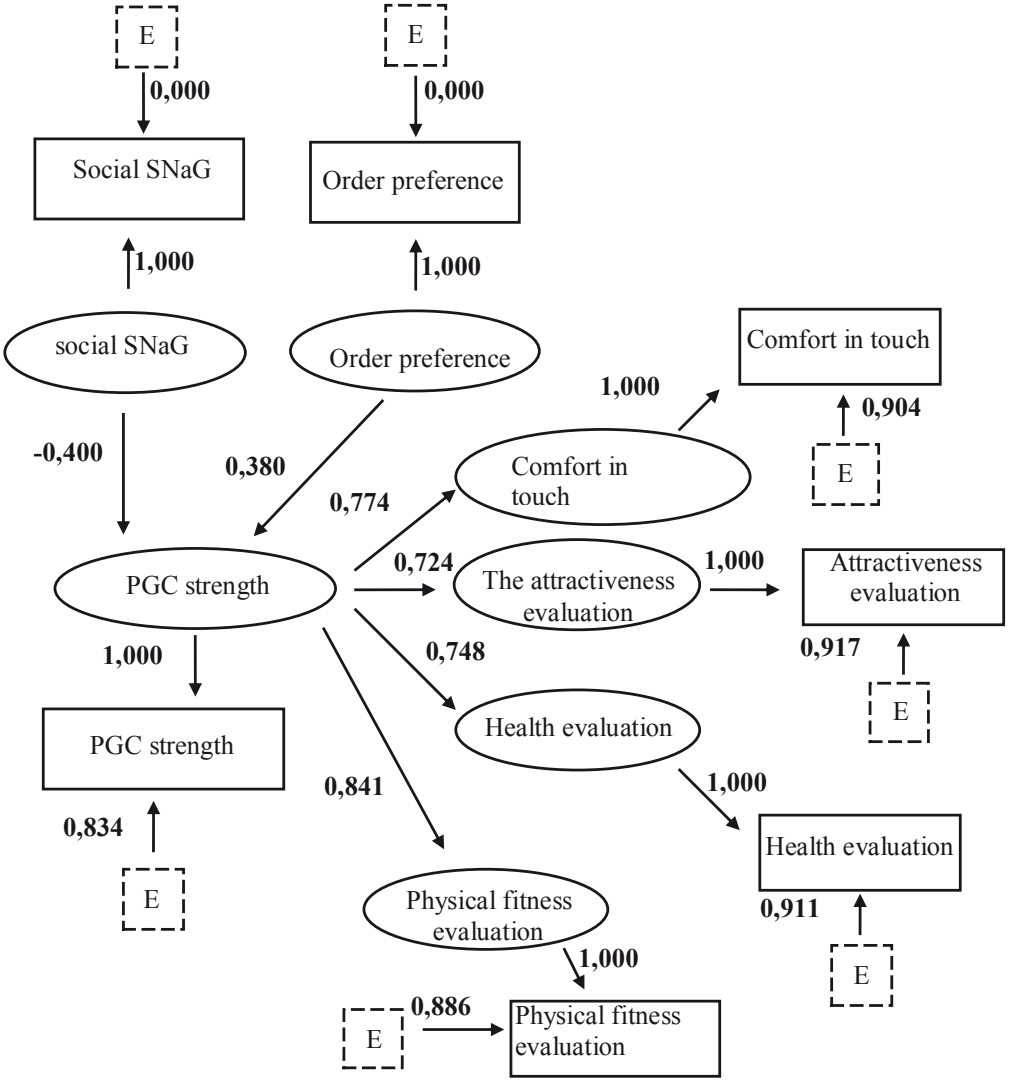

Diagram 1. The results of the path analysis for the model of the conditions and after-effects of the strength of the sense of body boundaries among the people suffering from the irritable bowel syndrome, N=56. In the rectangular brackets the open variables are shown; in the circular brackets, the hidden variables are shown; E means the residual variables that are shown in the frame with the dotted line. The negligible statistical relations are deleted from the model. The strength of PGC – the strength of the sense of body boundaries. Social SNaG – sensitivity to the violation of the self -boundaries in the dimension of the social self.

The path analysis among the patients with psoriasis and atopic dermatitis

The function discrepancy method GLS was applied, without assumed standardisation while adding to the analysis the correlations obtained between the variables.

The model presented below fitted well with the data: $chi^2(1) = 0,10$; $p = 0,756$.

The model which is presented (diagram 2) indicates that among the people suffering from psoriasis and atopic dermatitis, the strength of the sense of body boundaries is conditioned by the level of the need for cognitive closure in the decisiveness dimension. The important after-effect of the sense of body boundaries among those examined who had skin diseases is revealed to be the level of health orientation.

Discussion

This thesis has sought to recognise the conditions affecting the sense of body boundaries and their after-effects for body self- relation among the psychosomatically ill patients.

In the light of reports in the literature, people with symptoms of psychosomatic illness on the skin reveal a stronger sense of body boundaries than people with symptoms in the area of the digestive system, which was associated with personality differences[13] (Fisher, Cleveland, 1956, 1958; Fisher, 1963). In our own research (Krzewska, 2015), conducted earlier on a group of healthy and ill people (the same ones whose results are described in the following thesis), contrary to reports in the literature, there were not any significant intergroup differences in terms of the strength of the sense of body boundaries and its dimensions. The healthy individuals did not differ from either of the particular groups of ill people with regard to the strength of their sense of body boundaries and its dimensions. Additionally, the individuals with IBS did not differ in this regard from the individuals with psoriasis and atopic dermatitis. This leads to the following question: what are the factors that determine the strength of the sense of body boundaries and its dimensions in each particular group: the healthy subjects and the two groups of ill subjects.[14]

[13] Activity, volition and assertiveness vs, passivity and dependency.

[14] When in the first phase of the project the model of conditions and aftermaths of the sense of body boundaries among healthy people was tested (Krzewska, Dolińska Zygmunt, 2016), the path analysis showed that the strength of the sense of body boundaries depends on the style of cognitive functioning (independence from the field) and decisiveness – as the dimension of the need of cognitive closure. This model indicated that the sense of body boundaries among the healthy is conditioned by their comfort in touch, their evaluation of attractiveness and health evaluation. The conducted regression analysis, which was carried out at the same time, also revealed that among the healthy people the style of cognitive functioning and decisiveness as a dimension of the need of cognitive closure definitely explain the small range of variability of the strength of the sense of body boundaries and its dimensions. That is indicated based on the omission of the significant variables explained in the accepted theoretical model of the conditions and the aftermaths of the strength of the sense of body boundaries. In spite of the low percentage of explained variance, the collected results suggested that among healthy

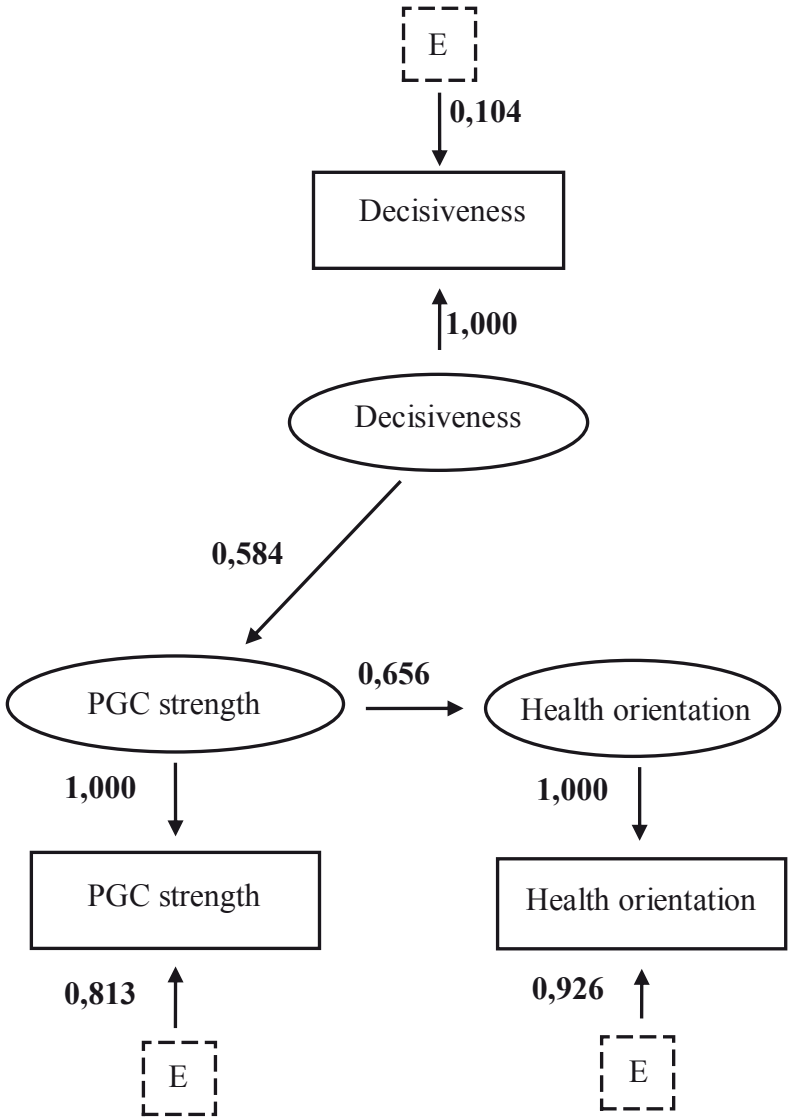

Diagram 2. The results of the path analysis for the model of the conditions and after-effects of the strength of the sense of body boundaries among the people suffering from psoriasis and atopic skin dermatitis, N=56. In the rectangular brackets, the open variables are shown; in the circular brackets the hidden variables are shown; E means the residual variables that are shown in the frame with the dotted line. The negligible statistical relations are deleted from the model. The strength of PGC – the strength of the sense of body boundaries.

The testing of the model of the conditions and the aftermaths of the sense of body boundaries among the people with irritable bowel syndrome indicated that the following factors affect the sense of body boundaries: sensitivity to the violation of self- boundaries in the dimension of the social self and order preference (the dimension of the need for cognitive closure). This result suggests that the issue of the sense of body boundaries among the patients with IBS can be manifested in their sense of social identity and in the matter of social functioning. Various interpretations are suggested by the influence of order preference (as a dimension of the need for cognitive closure) on the sense of body boundaries in this group. Perhaps this can be understood in two ways: firstly, as organising the experience of the disease according to rules that are beneficial for mental well-being and secondly, as attempting to compensate for the withdrawal from social relations. The studies by Endo and others (2011) indicate that lower self - efficacy is observed among people with IBS than those in the control group, which explains the direction of the interpretation. As shown in the unpublished studies by Krzewska and Ruda (2013), the strength of the sense of body boundaries remains in a positive relation with the sense of self - efficacy among young healthy people. These dependencies create interesting scope for further research and interpretations.

The path analysis among the patients with psoriasis and atopic dermatitis indicated that variable decisiveness (the need of cognitive closure dimension) is the main factor influencing the strength of the sense of body boundaries. This result suggests that decisiveness may be manifested by the way the people with the listed skin diseases experience their own bodies. This is another premise for the dependence of the sense of body boundaries on cognitive-motivational variables, instead of those strictly bound with the body. The result which was obtained indicates that psychological variables have a significant role in the sense of body boundaries (Krzewska, Dolińska-Zygmunt, 2016) not only among healthy people, but also among the ill people suffering from psoriasis and atopic dermatitis.

The outcome, which is difficult to interpret clearly, is the diversity of the determinants influencing the sense of body boundaries among the people with the previously mentioned skin and bowel diseases. The social factor should play an important role in the sense of body boundaries in both cases; nevertheless, it does not work in this way. This result opens a field of entertaining research and interpretations.

The results of the multiple regression analysis, conducted to reveal predictors of the strength of the sense of body boundaries and its dimensions, confirmed and completed the results of the path analysis. Considering the patients with IBS, the possibility to draw

people, the sense of the body boundaries is a phenomenon related not only to physical experience (like, e.g. perception of body signals) but also conditioned by a broader cognitive, emotional and motivational context. These results encouraged the formulation of questions about the character of the conditioning of the strength of the sense of body boundaries among psychosomatically ill patients.

conclusions about the strength of the sense of body boundaries and the sense of permeability of the boundaries was confirmed, especially based on their sensitivity to the violation of self- boundaries in the dimension of the social self.[15] The outcome indicates the significant importance of the loss of the sense of security in the social aspect for the sense of body boundaries and the sense of boundaries' permeability among the patients suffering from IBS. The higher this sensitivity is, the lower the strength of the sense of body boundaries is and, at the same time, the higher the sense of susceptibility to violation (permeability) is. This dependency can be justified by the character of the symptoms experienced by the unhealthy people: in case of diarrhoea, the patients complain about their constant anxiety over the uncontrollable symptoms and the huge feeling of helplessness accompanying it. It significantly reduces the comfort of social functioning and tends to lead to the experience of anxiety in social relationships; moreover, it frequently ends with avoidance of participation in social life (Hulisz, 2004).

The result, which is coherent with the one previously described, is the possibility of predicting the strength of the sense of body boundaries among people suffering from IBS, based on the order preference and on the permeability preference, both as dimensions of the need for cognitive closure. This dependence manifests itself in the following way: the increase in the order preference leads to an increase in the strength of the sense of body boundaries; whereas, the increase of permeability preference leads to a decrease in the strength of the sense of body boundaries. This causes some interpretation difficulties, because it seems to be self-contradictory. The need for permeability can often be referred to the predictability of situational factors (frequently random); while the need for order can be referred to the phenomenon of the will and controllable things, such as the factors targeted on the creation and maintenance of order. It can be supposed that the lower preference of predictability means that the unhealthy person copes with the symptoms (which are predictable for her/him) better, so the strength of his/her sense of body boundaries is bigger (Fisher, 1963). On the other hand, the preference of order can be a variable of personality, which helps an individual to cope with the disease.

The need of predictability (the dimension of the need of cognitive closure) among the people with IBS can for example be largely related to the risk of the necessity of suddenly going to the toilet. People with diarrhoea or a mixed form of IBS try to organise their day in a predictable manner; they do not like sudden situations, since they can be connected with a reduced sense of security in the body area. The possibility of predicting the strength of the sense of body boundaries based on the need of predictability can

[15] This pattern is characterised especially by women (Krzewska, 2015) and is coherent with the crucial advantage of women among the examined patients who were examined. Its presence leads to asking the following questions: if the same predictors of the sense of body boundaries would characterise a male group of patients with IBS?

probably be explained by the level of effectiveness in coping with the disease. The level of coping with other situational factors seems to be crucial. The lower the experience of the predictability of the situation, the stronger the sense of the body boundaries, as well as the lower the sense of the permeability of the boundaries. It is possible that these people are capable of predicting a situation, such as the symptoms of an illness and the possibility of coping with them in a predictable, safe and unequivocal manner.

Interestingly, the result is consistent with that observed among healthy people (not recognised as suffering from a psychosomatic illness, correlation model) (Krzewska, 2015). The increase in the strength of the sense of body boundaries together with the decrease in the intensity of the boundaries' permeability cause the diminishing of the need of permeability and the intolerance of ambiguity (the dimensions of the need of social closure) among healthy people. This suggests that health (and coping with an illness) can be identified with the ability to maintain one's own physical identity independently from changing environmental conditions. That can probably be linked with the ability to maintain internally referenced standards in spite of the instability of the situation (e.g. travelling on a bus without toilets can be negatively experienced by people with IBS as a more or less predictable situation). As it is known, the stronger the sense of body boundaries is, probably the bigger the personal resources are in coping with stress and processing data about the situation in accordance with internal standards (Jakubik, 2003; Witkin, 1968, Strealu, 2002, Fisher, Cleveland, 1958, Fisher, 1963, Fisher, 1970).[16] Additionally, it is worth recalling the result of the studies (Krzewska, 2015), according to which, among healthy people, a weak correlation is observed between the strength of the sense of body boundaries together with the sense of permeability and sensitivity to the violation of the self- boundary in the dimension of the symbolic-territorial self . Moreover, a correlation is noticed between the sense of permeability of boundaries and sensitivity to the violation of self- boundaries in the dimension of the social self . The last convergence assimilates the people with irritable bowel syndrome to the healthy ones; therefore the correlation is moderate in nature. This suggests that the patients with IBS have a severe representation of some instructions that are crucial for the sense of body boundaries. These instructions seem to be less important for healthy people.

The possibility of predicting the increase in the strength of the sense of body boundaries and the decrease in the sense of permeability of body boundaries based on increasing order preference (the dimension of the need of cognitive closure) is the characteristic and the distinction of people with irritable bowel syndrome in comparison to healthy people

[16] It seems to be probable that the strength of the sense of body boundaries among the IBS patients may be bound with the objective characteristics of the situation itself (e.g. little intensity of the symptoms of the disease for years) and also with the individual predispositions (the perception of the world and incoming information according to the safe and well-known scheme). (I.K.)

(Krzewska, Dolińska-Zygmunt, 2016) and those with skin diseases. The result is appealing in the light of reports concerning a higher intolerance of uncertainty among people with a stronger order preference (Kossowska, 2003). Uncertainty about the time and place when symptoms may occur seems to be a distinctive sign of irritable bowel syndrome. A stronger order preference should be associated with worse tolerance of uncertainty connected with the symptoms of less effective coping with illness and hence, a less strong sense of body boundaries, which is frequently considered in relation to the health potentials (Krzewska, Dolińska-Zygmunt, 2012; Krzewska, Ruda, Rymaszewska, 2012).[17]

Both sensitivity to the violation of self -boundaries in the dimension of social self as well as the need for cognitive closure in the dimensions of order preference and predictability, together explain about 30% of the variability of the strength of the sense of body boundaries among the people with IBS. In view of the psychological character of the factors causing an escalation in the symptoms of this syndrome, the meaning of the emerging predictors of the sense of body boundaries for the course of illness can be considered. In particular, an intriguing direction seems to be contemplation of the degree of need for control among IBS patients. They may experience a sense of disruption of physical identity, when they feel the impossibility of predicting (controlling?) a situation; what is more, they may feel reinforced symptoms under the influence of stress. Because of the fact that patients suffering from irritable bowel syndrome have a sense of the ineffectiveness of the treatment they receive, more often than with other diseases (Orzechowska and others 2013), it is worth studying personal factors in their assessment of the situation. It is worth mentioning that the results of the research do not show a lower sense of body boundaries among the patients with IBS in relation to the healthy people and those who are ill ; they do not indicate weaker predispositions in the scope of coping with the illness (also in the studies by Krzewska (2012), the IBS patients did not differ from the healthy ones in the area of the strength of the sense of body boundaries). The results display only the need for predictability (as a dimension of the need for cognitive closure) as a significant predictor of the strength of the sense of body boundaries in this group of the ill people .

The predictors that are essential for the sense of body boundaries in the case of irritable bowel syndrome (sensitivity to the violation of the boundary of the social self; the need of order and predictability) should be considered in relation to data on violence and sexual abuse;

[17] As already stated, the possibility of prediction of the increase of the strength of the sense of body boundaries and the decrease of the sense of permeability on the basis of the stronger need of order among the people with the irritable bowel syndrome can be related with their active and controllable attempts to organize the world in order to cope with the symptoms better as well as to encourage the sense of the impact on these symptoms. One of the instances is the attempt to organize the day in such way to avoid being away from the toilet (e.g. going home directly after work) or the need of order in terms of diet – that promotes a feeling of taking control of the symptoms and potentially reduces the need of predictability in this area, in connection with the experienced own effectiveness.

therefore, situations connected with chaos, violence, or abuse, which are mentioned by some researchers as crucial factors in IBS disclosure among some people (Nauert, 2011).

There is an impression that the sense of body boundaries can be conditioned by factors that are crucial for coping with an illness and experiencing oneself as a sick person; however, the nature of these factors remains dependent on health condition.

Among the people suffering from skin diseases, cognitive style (independence from the field) and the need for cognitive closure in the dimensions of decisiveness as well as predictability preference, explain about 50% of the variability of the strength of the sense of body boundaries – with an interpretatively interesting direction of dependence, according to which the increase in the need of predictability (the dimension of the need of cognitive closure), leads to the increase in the strength of the sense of body boundaries and the intensity of barrier, and the decrease in the sense of the boundaries' permeability. The result concerning the need of predictability is exactly opposite to the one obtained among the healthy people (here: in correlation analysis) (Krzewska, 2015) and the IBS patients (regression analysis): the sense of body boundaries among the people with skin diseases is stronger and higher than the need of predictability is. Among the people with irritable bowel syndrome with a strong sense of body boundaries, the hardly predictable symptoms of the disease can be less perceptible as an obstacle in everyday life; while, among the people with skin diseases with a stronger sense of body boundaries, and a higher need of predictability seems to be related to the need of influencing the symptoms of the skin disease – which can be controlled to a greater extent than the symptoms of IBS. These symptoms appear to have a character that is less surprising, less disrupting in social functioning and more stable in time than diarrhoea, which is difficult to control, and their predictability seems to be relatively higher than the symptoms of dysentery in IBS. The appearance in skin diseases can be regulated to a certain degree by means of clothing or make-up. Someone can also cope with it, for example, through appropriate management of the frequency of social contacts and places of residence. In the light of reports in the literature (Fisher, 1963), lower resistance to stress and the potentially increased need of predictability which is connected with it (the dimension of the need for cognitive closure) should be rather consistent with the weaker sense of body boundaries – which was connected with lower abilities of coping with stress. It is possible that higher stress levels among patients with skin diseases (Korabel, Dudek, Jaworek, Wojas-Pelc, 2008) promote the need of predictability, which can be associated with greater effectiveness and its realisation; and this connects with the stronger sense of body boundaries. In the research by Krzewska (2012), the people suffering from psoriasis and atopic dermatitis revealed a weaker sense of body boundaries than healthy people. Possibly, the preference for predictability can be interpreted in the group currently being investigated according to the implications that are

caused by a strong sense of body boundaries: such as the lack of an attitude of resignation, which is helpful in coping with stress and the symptoms of the disease.

The predictors of the strength of the sense of body boundaries among the patients with skin diseases assimilates this group to the group of healthy people (the need of cognitive closure in the dimension: decisiveness, cognitive style – independence from the field) (Krzewska, Dolińska-Zygmunt, 2016). Nevertheless, there are indications of participation which is five times higher in the explained variance than in the group of healthy people. Perhaps among people with skin diseases, being exposed to stress connected with the unsettled dimension of their own aesthetic as well as with the suffering connected with the pain and the duration of the illness is associated with an increase in the importance of such individual dispositions which foster a sense of physical separateness from the surroundings and the integrity of one's own body (barrier and permeability) – therefore coping better with the disease. Decisiveness as the dimension of the need of cognitive closure undoubtedly favours the sense of control; whereas, the ability to process information selectively in accordance with internal standards (independence from the field) can be significant for the maintenance of one's own identity and the efficient regulation of social contacts.

As far as the barrier predictors are concerned, in the group of people with skin diseases, decisiveness plays a special role (the dimension of the need for cognitive closure). The explained variance of 40%, among the people suffering from psoriasis and atopic dermatitis is additionally illustrated by their style of cognitive functioning (independence from the field) and their preference for predictability (the dimension of the need for cognitive closure). The fact that in the studies, among the healthy people these variables gain only marginal importance for the sense of body boundaries (Krzewska, Dolińska-Zygmunt, 2016) is probably related to the increased diversity of the examined sample and the existence of numerous additional factors that may have an influence on the sense of body boundaries in this group. In one of the studies, the people with skin diseases revealed higher indicators of separateness from the environment (barrier) than the ones with IBS, which can doubtlessly be linked with the occurrence of the symptoms on the surface of the skin and its greater presence in the subject's awareness (Krzewska, 2012). Conceivably, among people who are developing skin diseases, the sense of one's own separateness from the environment is conditioned by psychical instructions whose intensity exceed the beneficial levels for coping with stress, resulting in the symptoms of the disease. In another interpretation, such psychical instructions may be a characteristic adaptation of the illness's symptoms for people with skin diseases. It should also be noted that people with skin diseases show a correlation between the strength of the sense of body boundaries in both its dimensions and a global need for cognitive closure (Krzewska, 2015). It suggests the harmony of cognitive motivations for the maintenance of the sense of physical

identity in this group – that can signal the existence of a significant mechanism for coping with the illness. Additionally, the role of sensitivity to the violation of self -boundaries in the dimension of the symbolic-territorial self with regard to the sense of body boundaries and separateness from the environment (barrier) can be observed among patients with skin diseases (Krzewska, 2015), which indicates the spatial and material dimension of the factors that are meaningful to the sense of body boundaries in this group of ill people. In comparison with the people with IBS, whose symptoms are not visible to the environment, people with skin diseases struggle with the constant visibility of their symptoms – therefore the territorial aspect seems to be crucial for them.

Among the patients suffering from IBS, about 20% of variance, the sense of body boundaries is explained by the need for cognitive closure in the following dimensions: the preference of predictability and order, so by the factors that are also significant for the global strength of the sense of body boundaries of these people. Previous research by Krzewska (2012), which is different in comparison to the results described in the following thesis, pointed to the sense of barrier of body boundaries among the IBS patients compared to the healthy ones and the ones with skin diseases; moreover, it also pointed to a relatively higher involvement in external appearance in this group. It can be assumed that the sense of separateness from the environment (barrier) among people who are concentrated on the inside of their body (intestines) is the dimension that has a crucial compensatory meaning for the internal character of the symptoms and their importance for comfort in social relations. If we also take into account the sense of the permeability of body boundaries for the people with IBS, we can predict - mostly based on their sensitivity to the violation of self- boundaries in the dimension of the social self - that the compensatory meaning of the barrier dimension for feeling comfortable in one's own body gains importance.

Among the patients suffering from skin diseases, the sense of the susceptibility of the body's surface to violation (permeability) can be predicted at a level as high as 50% , on the basis of the same variables, which explain the global strength of the sense of body boundaries for these people: independence from the field (cognitive style) and decisiveness as well as predictability preference – as the dimensions of the need of cognitive closure. This can mean that the occurrence of symptoms on the surface of the skin is connected with the increased sense of physical sensitivity to violation; so, it is connected with a more physical character of the global strength of the sense of body boundaries than is observed among the IBS patients (among the latter, the relational and emotional character of the sense of body boundaries is marked and its predictors are the followings: sensitivity to the violation of self-boundaries in the dimension of the social self and the need for cognitive closure in the dimension of order preference). The following interpretation correlates with the observation

that the sense of the permeability of body boundaries among the skin disease patients can be predicted based on the intensity of proprioception; this kind of relation is not observed among healthy people (Krzewska, Dolińska-Zygmunt, 2016) or the ones with IBS (Krzewska, 2015). The higher the availability of the experiences from the body surface is, the stronger the sense of permeability of the boundaries among the people suffering from skin diseases is – and the nature of this dependence emerges as the opposite of what was expected (it was believed that an increase in insensitivity to proprioception leads to an increase in the sense of barrier and a decrease in the sense of the permeability of body boundaries). Among the people with skin diseases, this result seems to be understandable in view of the fact that the symptoms concerning the body surface can promote a general sense of their own susceptibility to violation in the body.

As shown by the results of these studies obtained from the group of psychosomatically ill patients – with IBS, psoriasis and atopic dermatitis (regression analysis and path analysis) in comparison with the results from healthy people (Krzewska, 2015, Krzewska, Dolińska-Zygmunt, 2016), the possibility of predicting (the range of variation) the strength of the sense of body boundaries and its dimensions as well as its genesis, are conditioned by various psychological factors, depending on health condition and the symptoms of the disease. The evaluation of the results of the research conducted among the group of psychosomatically ill people and healthy people (Krzewska, 2015, Krzewska, Dolińska-Zygmunt, 2016) also indicates some similarities in terms of the possibility of prediction and the understanding of the genesis of the sense of body boundaries in these groups.

The variety of determinants of the strength of the sense of body boundaries in the groups differ according to the symptoms of the psychosomatic disease (and, as it seems, health condition in general, Krzewska, 2015) and this shows that the sense of body boundaries can represent a slightly different psychological phenomenon, independently from its similar numerical values in the test studies. This interpretation opens the door to further research.

The test results which were collected (the regression and path analysis) indicate the polietiology of the sense of body boundaries among the psychosomatically ill patients and the high diversity in the range of importance that its particular conditions represent for the understanding of health and illness. The significance of the sense of body boundaries for coping with the illness seems to remain dependant on the nature of the symptoms being experienced and the manner of coping with them.

It is worth noticing that, similarly to the healthy people (Krzewska, 2015), the psychosomatically ill patients had results that speak for the sense of body boundaries as a phenomenon that is constituted by variables whose nature goes beyond the psychological experience of the body. It concerns the range of variables with a motivational-cognitive

character (especially among the patients with psoriasis and atopic dermatitis) as well as with elements of self conception (people with IBS). [18]

The research into the after-effects of the sense of body boundaries among the psychosomatically ill patients was again taken using the path analysis. Its results were in the area of the relation of a person with his or her own body, so a relation that is significant to the health condition.

The sense of body boundaries emerged as having a crucial influence on the evaluation of health and physical attractiveness, as well as the level of comfort in touch among the people suffering from IBS. It was corresponding among the healthy people (Krzewska, Dolińska-Zygmunt, 2016)– indicating the similarity of these groups in the range of the consequence of the way body boundaries are experienced. The greater the strength of the sense of body boundaries, the more positive the subject evaluates his or her own attractiveness, health condition and feeling in situations connected with touch. This result is the premise of the recognition of the universal influence of the sense of body boundaries on relations with one's own body and the level of comfort drawn from touch –variables of significant importance to health condition and its assessment. This influence is even more positive when the strength of the sense of body boundaries increases. The deviation from this pattern among the patients with skin diseases can be the exception that proves the rule (as described later).

The path analysis also demonstrated that, among the IBS patients, there is a significant impact of the sense of body boundaries on their evaluation of physical fitness – the more positive this influence is, the greater the strength of the sense of body boundaries is. This result distinguishes this group of the ill people in the other groups that were examined; moreover, it creates an interesting possibility for interpretation in the light of reports of the relatively less active and "volitional" attitude to reality among psychosomatically ill patients with symptoms inside the body (Fisher, Cleveland, 1956). Symptoms concerning the intestines can favour this kind of orientation. As our own studies show, experiencing gastrointestinal symptoms not only excludes the benefits that can be gained from the strength of the sense of body boundaries in the area of self-assessment of the physical condition (positive influence), but also even determines this state of affairs. This conclusion tends to reflect the fact that the objective symptoms probably do not always correspond with the cognitive and emotional involvement with the areas of the body that are related to them[19].

[18] It should be mentioned that the concentration of attention on the body surface proved to be a negligible predictor of the strength of the sense of body boundaries, which indicates the incorporeal nature of the psychological factors in the genesis of the phenomenon being examined.

[19] During the research connected with the construction of The Sense of Body Boundaries Questionnaire, the people who took part frequently declared the concentration of their attention on entirely different body parts

As far as the patients suffering from psoriasis and atopic dermatitis are concerned, the sense of body boundaries was revealed as having a crucial influence on the level of orientation on health: active engagement in maintaining or improving the health condition. The strong sense of body boundaries influences the psoriasis patients to make an effort to maintain or improve their health. These results confirm the hypothesis concerning the crucial role that the sense of body boundaries has on shaping the health condition of each person. Additionally, they are consistent with the assumption that the people who are focused on the body surface demonstrate a task orientation that is focused on actively changing their situation (Fisher, Cleveland, 1956). In this case, the patients who are potentially most focused on the skin (from all the examined groups), turn out to be actively focused on health; despite the lack of stronger indicators of the sense of body boundaries in comparison to other groups[20]. The people with skin diseases achieve probably the best results regarding their commitment to health as determined by the strength of the sense of body boundaries; because the skin symptoms seem to be a more objective obstacle in the positive evaluation of appearance, health condition and comfort in touch. It should be mentioned that the sense of body boundaries among this group of people did not influence such areas of body self- relation as the evaluation of attractiveness, health and comfort in touch; this can be explained by the nature of the symptoms.

The influence of the sense of body boundaries with relation to the evaluation of attractiveness, health and comfort in touch appears to be modified by the nature of the symptoms of the psychosomatic illness; furthermore, it seems to be exposed in those areas of coping with the illness with the highest importance for the sense of health.

The determinants and after-effects of the sense of body boundaries among the psychosomatically ill people with psoriasis and atopic dermatitis as well as with IBS, partly assimilate these groups with the healthy groups . It also emerged that the pattern of the conditions of the sense of body boundaries in both groups can be modified by the symptoms of the psychosomatic illness; furthermore, it can be connected with the means of coping with the illness. Additionally, the psychosomatic illness seems to constitute the background for the specific influence of the sense of body boundaries on the patient's relation with his or her own body. The knowledge of these dependences can contribute to a bet-

than seemed to be implied from the symptoms of the illness which they were suffering from (Krzewska, Dolińska-Zygmunt 2013). For instance, a person suffering from a chronic kidney disease mentioned only the external parts of the body which were devoted most of the attention in the context of taking care of beauty. It is not known if these answers were only declarative in nature or were compatible with the actual attitude of the respondents, e.g. with a compensatory nature in the face of common symptoms.

[20] The lack of differences in the field of the concentration of attention on the body surface (not only in the range of the sense of body boundaries) among people with differing health condition and disease symptoms (the skin vs. the digestive system) is a surprising result. Achieving this result opens up numerous questions, among others, whether the declared conscious concentration of attention on the particular body parts actually coincides with their everyday representation in the subject's awareness.

ter understanding of the psychological needs of people with psychosomatic illnesses (irritable intestines and the skin diseases described above); what is more, it can lead to the recognition of the functions of the body boundaries in a particular illness and the mechanisms for coping with it.

Our previous research (Krzewska, 2015) did not confirm the differentiating importance of the sense of body boundaries for the health condition of the patients we examined; however, they indicated appealing differences in the range of opportunities for predicting the strength of the sense of body boundaries and its dimensions among people who varied because of their health condition. This allows the extraction of significant therapeutic problems among the people with particular diseases, and hence, the possibility of indicating the areas of practical use of the results obtained . It is worth remembering that, among the IBS patients, emotional-social factors have a greater role in the aetiology of the sense of body boundaries; whereas, among the patients with skin diseases, physical and cognitive factors are more important. This is an interesting premise for the understanding of the factors that potentially aggravate the disease and, moreover, are areas of therapeutic effects. One of the examples of these kind of effects can be the strengthening of resolute attitudes (the dimension of the need of cognitive closure) among patients with skin diseases – this can encourage them to cope with the illness according to the results which were obtained. For the IBS patients, the crucial factor in easing the symptoms was the strengthening of their own sense of security in the area of social relations (e.g. through exercising interpersonal competence, such as assertiveness) as well as the strengthening of their own sense of perpetration through sport. The significance of these variables for the sense of body boundaries among patients with IBS may be an important indication for the understanding of the psychological issues connected with this disease.

The sense of body boundaries, according to the literature (Krueger, 2002ab; Mirucka 2003ab; Kowalik, 2003; Sakson-Obada, 2009; Sakson-Obada and Mirucka, 2013), appears to be an instance of the body self regulating body-self relation in the areas of health and disease. Irrespective of which aspects of the body relations gain from an increase in the sense of body boundaries, this influence seems to be mostly positive.

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