

FACTORS DETERMINING THE HEALTH LOCUS OF CONTROL IN PATIENTS AND HEALTHY INDIVIDUALS

Czynniki determinujące umiejscowienie kontroli zdrowia u osób chorych i zdrowych



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Summary

Aim of the study: The aim of this study was to compare the dimensions of the Multidimensional Health Locus of Control (MHLC).

Material and methods: This study included 296 individuals. This group included 99 patients of the General, Gastroenterological, Colorectal, and Oncological Surgery Ward hospitalised due to the primary surgical treatment of colorectal cancer (Group A) and 100 patients who were operated on due to gallstones (Group B). The control group (Group C) comprised 97 participants who were free from cancer or gallstones and selected at random from visitors to the Clinic. All participants were asked to complete the standardised questionnaire Multidimensional Health Locus of Control (MHLC) along with the General Self-Efficacy Scale (GSES).

Results: The only MHLC dimension whose values differed significantly between compared groups was the Powerful others parameter. Mean values of this dimension in both groups of patients were significantly higher than in the controls. On detailed analysis, this finding was confirmed only in participants aged 65 years or older, as well as in married and professionally inactive individuals.

Conclusions: This study explicitly revealed that in lieu of disease, people transfer to others most responsibility for their health, which is not a fully favourable attitude. Consequently, they should be provided with proper support oriented towards strengthening their internal health locus of control along with acceptance and active participation in the therapy ordered by a doctor. Special attention should be paid to lonesome patients. Moreover, systemic activities should be undertaken to provide easier access to health services for professionally active patients.

Key words: health locus of control, MHLC, GSES, self-efficacy.

Streszczenie

Cel pracy: Celem pracy było porównanie wartości poszczególnych wymiarów skali MHLC w jednolitych grupach osób chorych o różnym rokowaniu i ludzi zdrowych o podobnym rozkładzie zmiennych metrykalnych.

Materiał i metody: Badaniem objęto 296 osób. W tej próbie znalazło się 99 kolejnych pacjentów Oddziału Klinicznego Chirurgii Ogólnej hospitalizowanych z powodu pierwotnego leczenia chirurgicznego raka jelita grubego (grupa A) oraz 100 kolejnych pacjentów operowanych z powodu kamicy pęcherzyka żółciowego (grupa B). Grupę kontrolną (grupa C) stanowiło 97 uczestników wolnych od choroby nowotworowej i kamicy pęcherzyka żółciowego, dobranych losowo spośród osób odwiedzających chorych na Oddziale. Wszystkich uczestników poproszono o wypełnienie standaryzowanych arkuszy Wielowymiarowej skali umiejscowienia kontroli zdrowia (MHLC) oraz Skali uogólnionej własnej skuteczności (GSES).

Wyniki: Jedynym wymiarem MHLC, którego wartości różniły się istotnie między porównywanymi grupami, był parametr *Wpływ innych*. Średnie wartości tego wymiaru w obu grupach pacjentów były znacznie wyższe niż w grupie kontrolnej. W szczegółowej analizie stwierdzono to tylko u uczestników w wieku 65 lat lub starszych, a także u osób zameężnych i nieaktywnych zawodowo.

Wnioski: Przeprowadzone badanie jednoznacznie wykazało, że osoby chore w znacznym stopniu przenoszą ciężar kontroli zdrowia na innych, co jest zjawiskiem nie do końca korzystnym. W związku z tym konieczne jest zapewnienie im odpowiedniego wsparcia, ukierunkowanego na wzmocnienie kontroli wewnętrznej oraz akceptację i zaangażowanie w terapię. Szczególną opieką należy otoczyć osoby samotne. Potrzebne są też działania systemowe umożliwiające lepszy dostęp do opieki zdrowotnej pacjentom, którzy w momencie rozpoznania choroby byli aktywni zawodowo.

Słowa kluczowe: umiejscowienie kontroli zdrowia, MHLC, GSES, poczucie własnej skuteczności.

Introduction

The health awareness of a community is very important from the viewpoint of health prevention [1]. Health awareness can be defined as sufficient knowledge in regard to risk factors for various diseases, and practical application of this knowledge in order to avoid these factors whenever possible, or reduced exposure to them. Another manifestation of sufficient health awareness is partaking in regular prophylactic screening to detect potential diseases at the early stages when the probability of recovery is markedly higher. Finally, cooperation with a physician in the course of the therapeutic process and following his/her prescriptions constitute measures of health awareness in case of disease. Therefore, it can be generalised that high health awareness corresponds to exhibiting proper health behaviours [2].

Health behaviours undoubtedly play important roles in determining the health status of communities, but the evaluation of these roles remains difficult. Proper health behaviours (or lack of them) usually have long-term consequences, with the identification of respective cause-effect relationships having proven to be difficult. Research in this field is also complicated due to the the complex characteristics of the activities involved in health behaviours. Potential factors that may influence health behaviour level include age and gender, educational level, place of residence, financial and time resources, psychological status, and environmental considerations, among others. In the case of patients, participation within the therapeutic process is also modulated by their awareness pertaining to diagnosis and further prognosis [3-5]. However, the role of all these aforementioned factors and their mutual interactions during health awareness determination are still not fully understood [3].

Consequently, health psychologists still search for standardised tools allowing indirect evaluation of health awareness measures. One such tool is the Multidimensional Health Locus of Control (MHLC), which was designed in 1970 [6-8]. MHLC analyses the respondent's expectations pertaining to three dimensions of health control: internality, powerful others, and chance. From a prevention viewpoint, high values of internality are most desirable, whereas during the therapeutic

process also an important role of powerful others (namely: medical personnel) is required.

Numerous comparative studies on values of particular MHLC dimensions in health and diseased individuals have been performed thus far [9-16]. However, the results of these studies are not entirely consistent – mostly due to the presence of many confounders.

Consequently, the aim of this study was to compare particular MHLC dimensions between two homogeneous groups of patients with different prognoses and a group of healthy individuals with similar distribution of demographic variables. Additionally, this study analysed the influence of demographic variables on particular MHLC dimensions along with the relationship between MHLC type distribution and the distribution of the General Self-Efficacy Scale (GSES) values – a tool designed to assess self-beliefs to cope with a variety of difficult demands in life.

Material and methods

This study included 296 individuals. This group included 99 patients of the General, Gastroenterological, Colorectal, and Oncological Surgery Ward hospitalised due to primary surgical treatment of colorectal cancer (Group A) and 100 patients who were operated on due to gallstones (Group B). The control group (Group C) comprised 97 participants who were free from cancer or gallstones and selected at random from visitors to the Clinic. The statistical characteristics of the study participants are summarised in Table 1.

Patients from Group A and B were subjected to a questionnaire survey during the pre-operative period, whereas participants in the control group completed the questionnaire during their visits to the Clinic. All participants were asked to complete the standardised questionnaire “Multidimensional Health Locus of Control” (MHLC) along with the “General Self-Efficacy Scale” (GSES) form, kindly provided by the Workshop of Psychological Tests by the Polish Psychological Society in Warsaw. The MHLC form includes 18 statements pertaining to general respondent expectations in three dimensions of health control: 1) Internality, 2) Powerful others, and 3) Chance. Possible scores for each dimension ranges from six to 36 points. Depending

Table 1. Statistical characteristics of the study participants

Parameter	Group A (n = 99)	Group B (n = 100)	Group C (n = 97)	p value ¹
Age (years)	64.19 ±9.92	60.94 ±10.73	62.11 ±10.99	0.091
≥ 65 years, n (%)	55 (55.56)	39 (39.00)*	40 (41.24)*	0.040
Women, n (%)	46 (46.46)	56 (56.00)	48 (49.48)	0.388
Married, n (%)	72 (72.73)	67 (67.00)	70 (72.16)	0.620
Professionally active, n (%)	26 (26.26)	33 (33.00)	36 (37.11)	0.259

¹ANOVA or Pearson's chi-square test, *significant differences between groups

on the dimension, Cronbach's reliability index (alpha index) of the Polish MHLC version ranges from 0.54 to 0.74 [3]. Designed in 1990, the GSES form includes 10 questions regarding general self-beliefs of respondent to cope with a variety of difficult demands in life [17]. Cronbach's reliability index (alpha index) of the Polish GSES version amounts to 0.78 [3].

The three groups of subjects were compared in terms of mean levels of each of the three MHLC dimensions and mean values of GSES, as well as in terms of MHLC type distribution [18] and the distribution of GSES values within the standard ten scale for the Polish population [3]. Also, associations between demographic variables and mean levels of each of the three MHLC dimensions were analysed along with the relationship between MHLC type distribution and GSES distribution within the standard ten scale.

Continuous variables were presented as arithmetic means and their standard deviations (SD). Normal distribution was tested using the Shapiro-Wilk test. Arithmetic means between the A, B, and C groups were compared using ANOVA and the Tukey post-hoc test. The influence of demographic (grouping) variables on mean values of each of the three MHLC dimensions within particular groups of patients was analysed with an aid of Student's *t*-test for independent variables. Discrete variables were presented as number and percentage distributions. Their distributions amongst the groups and the relationship between MHLC type distribution and GSES distribution within the standard ten scale were compared using the Pearson's chi-square test. Calculations were performed

using Statistica 7 (StatSoft®, Poland) software, with statistical significance defined as $p \leq 0.05$.

Results

The only MHLC dimension whose values differed significantly between compared group was the Powerful others parameter. Mean values of this dimension in both groups of patients were significantly higher than in the controls (Table 2).

Female colorectal cancer patients were characterised by significantly lower values of Internality than males from Group A. Mean values of Internality amongst women from this group were also significantly higher compared to female gallstone patients and women from the control group. In the male subgroup of gallstone patients, in turn, the mean values of Chance were significantly lower than in women affected with this disease (Table 3).

No significant influences of participant age and marital status and their employment status were observed on the mean values of particular MHLC dimensions. The occurrence of higher values of Powerful others in the case of disease was confirmed only in subgroups of participants aged 65 years or older, as well as in married and professionally inactive individuals (Tables 4-6).

Analysed groups did not differ in terms of MHLC type distribution. Undifferentiated weak type of health locus of control predominated within all analysed groups (Table 7).

Table 2. Mean values (\pm standard deviations) of particular MHLC dimensions in colorectal patients (Group A) and gallstone patients (Group B) and in the controls (Group C)

Parameter	Group A (n = 99)	Group B (n = 100)	Group C (n = 97)	p value ¹
Internality	26.40 \pm 6.09	27.52 \pm 5.17	27.68 \pm 5.05	0.204
Powerful others	29.89 \pm 4.73	29.92 \pm 5.25	26.93 \pm 6.12*	< 0.001
Chance	24.56 \pm 5.81	24.30 \pm 6.22	22.93 \pm 5.81	0.123

¹ANOVA, *significant differences between groups (Tukey post-hoc test, $p \leq 0.05$)

Table 3. Mean values (\pm standard deviations) of particular MHLC dimensions in analysed groups stratified depending on participant gender

Parameter	Gender	Group A (n = 99)	Group B (n = 100)	Group C (n = 97)	p value ¹
Internality	female	24.91 \pm 6.31	27.80 \pm 5.20*	27.44 \pm 4.50*	0.017
	male	27.70 \pm 5.64	27.16 \pm 5.18	27.92 \pm 5.57	0.792
	p value ²	0.022	0.539	0.641	
Powerful others	female	29.15 \pm 5.63	29.84 \pm 5.36	26.27 \pm 6.79*	0.007
	male	30.53 \pm 3.72	30.02 \pm 5.16	27.57 \pm 5.38*	0.005
	p value ²	0.150	0.863	0.298	
Chance	female	25.13 \pm 5.64	25.68 \pm 6.51	23.17 \pm 6.52	0.111
	male	24.06 \pm 5.96	22.55 \pm 5.42	22.69 \pm 5.08	0.320
	p value ²	0.362	0.012	0.691	

¹ANOVA, ²Student's *t*-test for independent variables, *significant differences between groups (Tukey post-hoc test, $p \leq 0.05$)

Table 4. Mean values (\pm standard deviations) of particular MHLC dimensions in analysed groups stratified depending on participant age

Parameter	Age	Group A (n = 99)	Group B (n = 100)	Group C (n = 97)	p value ¹
Internality	\leq 64 years	26.95 \pm 5.20	27.64 \pm 5.06	28.12 \pm 4.56	0.499
	> 65 years	25.96 \pm 6.74	27.33 \pm 5.41	27.05 \pm 5.67	0.506
	p value ²	0.424	0.775	0.305	
Powerful others	\leq 64 years	29.80 \pm 4.65	29.03 \pm 5.82	27.63 \pm 5.88	0.136
	> 65 years	29.96 \pm 4.84	31.31 \pm 3.88	25.93 \pm 6.39*	< 0.001
	p value ²	0.862	0.034	0.178	
Chance	\leq 64 years	23.70 \pm 5.54	24.18 \pm 5.88	23.26 \pm 5.04	0.665
	> 65 years	25.24 \pm 5.98	24.49 \pm 6.80	22.45 \pm 6.80	0.114
	p value ²	0.194	0.811	0.501	

¹ANOVA, ²Student's t-test for independent variables, *significant differences between groups (Tukey post-hoc test, $p \leq 0.05$)

Table 5. Mean values (\pm standard deviations) of particular MHLC dimensions in analysed groups stratified depending on participant marital status

Parameter	Marital status	Group A (n = 99)	Group B (n = 100)	Group C (n = 97)	p value ¹
Internality	single	26.00 \pm 7.01	27.85 \pm 4.20	27.96 \pm 4.89	0.322
	married	26.56 \pm 5.76	27.36 \pm 5.62	27.57 \pm 5.13	0.512
	p value ²	0.688	0.658	0.734	
Powerful others	single	29.56 \pm 6.19	29.30 \pm 5.10	27.85 \pm 5.63	0.482
	married	30.01 \pm 4.10	30.22 \pm 5.33	26.57 \pm 6.31*	< 0.001
	p value ²	0.670	0.412	0.359	
Chance	single	24.81 \pm 5.01	25.58 \pm 4.72	23.11 \pm 7.47	0.258
	married	24.46 \pm 6.11	23.67 \pm 6.79	22.86 \pm 5.09	0.288
	p value ²	0.787	0.151	0.848	

¹ANOVA, ²Student's t-test for independent variables, *significant differences between groups (Tukey post-hoc test, $p \leq 0.05$)

Table 6. Mean values (\pm standard deviations) of particular MHLC dimensions in analysed groups stratified depending on participant employment status

Parameter	Working	Group A (n = 99)	Group B (n = 100)	Group C (n = 97)	p value ¹
Internality	no	26.32 \pm 6.13	27.57 \pm 5.25	27.59 \pm 5.30	0.308
	yes	26.65 \pm 6.11	27.42 \pm 5.10	27.83 \pm 4.66	0.681
	p value ²	0.809	0.897	0.820	
Powerful others	no	29.93 \pm 5.01	30.70 \pm 4.07	27.25 \pm 6.13*	< 0.001
	yes	29.77 \pm 3.95	28.33 \pm 6.86	26.39 \pm 6.16	0.084
	p value ²	0.882	0.033	0.508	
Chance	no	24.90 \pm 5.73	24.99 \pm 6.23	23.10 \pm 6.10	0.138
	yes	23.58 \pm 6.03	22.91 \pm 6.06	22.64 \pm 5.37	0.817
	p value ²	0.320	0.117	0.709	

¹ANOVA, ²Student's t-test for independent variables, *significant differences between groups (Tukey post-hoc test, $p \leq 0.05$)

Analysed groups did not differ in terms of mean GSES values and these value distributions within the standard ten scale (Table 8). There was significant association between MHLC type of health locus of control and GSES values within the standard ten scale ($p = 0.010$).

Discussion

This study revealed that disease development and treatment necessity are reflected by significant changes in health locus of control distribution, manifested by significantly higher impact of Powerful others when

Table 7. MHLC type distribution amongst colorectal cancer patients (Group A) and gallstone patients (Group B) and in the controls (Group C)

MHLC type	Group A (n = 99)	Group B (n = 100)	Group C (n = 97)	p value ¹
Strong internal type, n (%)	9 (9.1)	10 (10.0)	11 (11.3)	0.982
Strong external type, n (%)	6 (6.1)	9 (9.0)	8 (8.2)	
Powerful others belittling type, n (%)	8 (8.1)	8 (8.0)	11 (11.3)	
Powerful others augmenting type, n (%)	13 (13.1)	9 (9.0)	10 (10.3)	
Chance belittling type, n (%)	9 (9.1)	6 (6.0)	7 (7.2)	
Chance augmenting type, n (%)	10 (10.1)	10 (10.0)	13 (13.4)	
Undifferentiated strong type, n (%)	21 (21.2)	20 (20.0)	16 (16.5)	
Undifferentiated weak type, n (%)	23 (23.2)	28 (28.0)	21 (21.6)	

¹Pearson's chi-square test**Table 8.** Mean values (\pm standard deviations) of GSES values and their distributions within the standard ten scale in colorectal cancer patients (Group A) and gallstone patients (Group B) and in controls (Group C)

Parameter	Group A (n = 99)	Group B (n = 100)	Group C (n = 97)	p value
GSES (pts)	32.07 \pm 4.75	32.04 \pm 4.65	31.36 \pm 4.88	0.5001
GSES (standard ten scale)				
1, n (%)	1 (1.0)	0 (0.0)	0 (0.0)	0.4952
2, n (%)	3 (3.0)	0 (0.0)	0 (0.0)	
3, n (%)	0 (0.0)	1 (1.0)	3 (3.1)	
4, n (%)	1 (1.0)	5 (5.0)	3 (3.1)	
5, n (%)	5 (5.1)	5 (5.0)	7 (7.2)	
6, n (%)	13 (13.1)	16 (16.0)	13 (13.4)	
7, n (%)	28 (28.3)	25 (25.0)	30 (30.9)	
8, n (%)	27 (27.3)	23 (23.0)	21 (21.6)	
9, n (%)	13 (13.1)	15 (15.0)	14 (14.4)	
10, n (%)	8 (8.1)	10 (10.0)	6 (6.2)	

¹ANOVA, ²Pearson's chi-square test

compared to the controls. However, significant differences in values of particular MHLC dimensions were not noted between the groups of patients with different aetiologies and outcomes (i.e. colorectal cancer and gallstones). The only exception pertained to female colorectal patients whose internal control values were significantly lower than in women from other groups and in male cancer patients.

Transferring health locus of control onto powerful others is not surprising in lieu of disease. Similar results were revealed in previous studies of diseased subjects, such as HIV-positive persons, individuals suffering with chronic fatigue syndrome or posttraumatic stress disorder, in epilepsy patients, and kidney cancer [19-23]. One should hope that in the respondents' opinion the term "others" pertained to healthcare workers. It should be remembered, however, that – particularly in lieu of cancer diagnosis – many patients refer to non-conventional (and frequently evidence-deficient) alternative forms of therapy. This attitude is usually reflected by a delay in proper oncologic therapy and worsened prognosis [24]. Therefore, psychological support should

immediately be provided to the patient whenever cancer (or other disease with unfavourable prognosis) is diagnosed, in order to give direction to his/her expectations regarding health control by others. The results of previous studies suggest that in lieu of disease alternative forms of therapy are sought mainly by individuals with predominant internal health locus of control [25]. Consequently, this group of patients requires particular care and support in the case of disease diagnosis.

One should expect that in lieu of disease with a priori unfavourable prognosis, such as colorectal cancer, negative changes will take place in the mentality of many patients, manifested by weakened internal locus of control and an increased role of chance as a determinant of further prognosis. This theory was supported by a study of patients with persistent motor neuron disease [26]. However, we did not observe this phenomenon in our group of colorectal cancer patients. This surprising observation seems at least partly to be related to the fact that our study was carried out at the onset of oncologic therapy, prior to surgery, which raised hopes of recovery in many patients. Plausibly,

also weakened internal control observed amongst female colorectal patients had similar aetiology. Besides the stronger influence of Powerful others observed amongst Japanese women by Kuwahara *et al.* [27], and a marked role of Chance in determining the health of women from a Native American minority described by Egan *et al.* [28], previous studies did not reveal a significant influence of gender on health locus of control distribution.

Analysis of particular MHLC dimension values stratified by demographic characteristics of respondents revealed that previously mentioned differences in Powerful others health locus of control pertained only to the subset of married or professionally inactive participants. Therefore, marital status and employment status seem potential determinants of respondent expectations regarding control of their health by other individuals. The influence of these two aforementioned factors on external health locus of control has not been studied thus far. In the case of marital status, the association revealed in this study was probably related to support offered to the patient by his/her family members. This finding points to the necessity of particular care and psychological support provided to lonesome patients who cannot expect any help from their families.

In turn, the role of employment status seems to result from the current situation of public healthcare in Poland. Due to long waiting times for specialist consultations and negative employers' attitude to disease-related absence from work, many professionally active individuals have to delay medical consultation despite their disease. This, in turn, has poor effects on prognosis and disease outcome. This theory was at least partially supported by a study of participation in prophylactic screening by professionally active women [29].

In this study, we did not observe a significant influence of participant age on their expectations regarding health locus of control. This phenomenon probably resulted from the age distribution within the analysed groups; they were predominated by elderly people, and previous studies (also in Polish population) revealed that no significant changes take place in MHLC values after 30 years of age [3]. According to various authors, younger individuals are characterised by predominantly internal health locus of control and also higher impact of the Chance variable. However, with age an increasing role of Powerful others is observed [27, 28, 30-34]. According to the literature, lower educational level is another factor (not included in our analysis) that promotes susceptibility to the Influence of others and the role of Chance [27, 34].

Our analysis revealed significant association between MHLC type distribution of health locus of control and the distribution of GSES values. Therefore, we have

confirmed previously revealed high consistence of these two scales [3].

In lieu of current evidence, proper distribution of health locus of control in diseased individuals has a significant influence on further prognosis. In most previous studies, the predominance of internal control was reflected by better therapeutic results – this phenomenon was described in many disorders, e.g. in hypercholesterolaemia, motor neuron disorders, type 2 diabetes, posttraumatic stress disorder, and epilepsy [21, 26, 31, 35, 36]. Therefore – particularly in lieu of chronic disorders – it seems reasonable to determine a baseline level of health locus of control. It should be further monitored and interventions towards internal locus of control strengthening should be undertaken whenever needed. Studies amongst HIV carriers confirmed that participation in support groups is an efficient factor promoting internal health locus of control [37]. In lieu of this finding and many other advantages, organisation of support groups seems a reasonable component of psychological care in chronically diseased patients.

In conclusion, this study explicitly revealed that in lieu of disease, people transfer to others most responsibility for their health, which is not a fully favourable attitude. Consequently, they should be provided with proper support oriented towards strengthening their internal health locus of control along with acceptance and active participation in the therapy ordered by a doctor. Special attention should be paid to lonesome patients. Moreover, systemic activities should be undertaken to provide easier access to health services for professionally active patients.

The authors declare no conflict of interest.

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