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Health behaviors and psychological health control types among university students

Abstract

Introduction. The factors that influence gaining good results of prophylactic programs are human attitudes to health. These attitudes manifest themselves as individual beliefs and health-oriented behaviors.

Aim. The aim of the research was to investigate relations between the health control types and health behaviors performed by the university students.

Material and methods. The research was conducted in the group of 532 Polish university students in 2009. The average age in the researched group was M=20.74 (SD=1.542). Two questionnaires were used in the survey: the Multidimensional Health Locus of Control Scale (MHLC) worked out by Wallston, Wallston & R. DeVellis and the Inventory of Health Behaviors (IHB) by Juczynski. The MHLC scale allows for evaluating three dimensions of the health locus of control, namely: Internal Health Locus of Control (IHLC), Powerful Others Health Locus of Control (PHLC) and Chance Health Locus of Control (CHLC). The Inventory of Health Behaviors (IHB) allows for estimating various kinds of health behaviors categorized into four groups: diet habits, preventive behaviors, positive psychical attitude and health practices.

Results. The health behaviors correlate most strongly with the PHLC dimension. The higher result in the PHLC dimension was obtained, the higher were the results in the following three dimensions: preventive behaviors, positive psychical attitudes and health practices.

Conclusions. Students manifest the belief that internal control (IHLC) prevail over external sources of health control (PHLC, CHLC). In the studied group, the women have exhibited significantly greater intensification of good diet habits and preventive behaviors. The main factor modifying preventive behaviors performed by researched students is the belief in the influence of other people on the students' health status.

Keywords: health locus of control types, health behavior, health promotion, health education, students.

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INTRODUCTION

The function of individual beliefs and resulting from them behaviors in the disease prophylaxis models has been widely discussed since the half of the previous century. Many categories have been suggested in the professional literature as the way to conceptualize the genesis of risky behaviors. The categories are to describe human beliefs in the light of their relation to certain health behaviors and to describe the ways behaviors are controlled. One of the most important and widely discussed categories is the category "locus of control" that already appeared in the Julian Rotter's social learning theory [1]. According to J. Rotter's social learning theory the internal (I) locus of control and the external (E) locus of control should be differentiated. The term "locus of control" refers to the "location" where the psychological control mechanism resides. The successful application of Rotter's main ideas to research on beliefs and health attitudes (in the social and individual aspect) should be attributed to Wallston's research team. The Multidimensional Health Locus of Control Scale (MHLC) was developed in 1978 [2-4]. The MHLC scale reveals three important dimensions of the health control: an internal dimension of the health control and two external dimensions – the influence performed by other people and the chance [2]. One of assumptions the scale is based on is discussed in the literature on the health education and public health. The assumption states that the internal health locus of control promotes health-oriented attitudes. The health locus of control allows foreseeing some behavioral and cognitive actions relating to psychic and physical health [5].

Recently there have also been some attempts to evaluate the modulation of the health locus of control and its correlations with some chosen health attitudes and the advancement in the academic education [6,7] and the cultural specificity and health attitudes in the developing countries among

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university students [8]. Further systematic research on the causal relations between the health locus of control and health attitudes in order to understand psychological and behavioral indicators of the human health was suggested [4].

In the light of the above-mentioned facts, the essential scientific problem of a preventive medicine and health promotion is the relation between the type of health locus of control and the health attitudes in certain social groups [9]. It is worth focusing on the groups of people that are entering the adult and professional life, because modification of health behaviors that occurs in such a phase of life may result in the relatively greatest benefits as far as the population health and medical economics are concerned. One of the groups important for educational benefits is a group of university students. During recent decade the extended comparative research has been conducted on the health attitudes and behaviors of university students in most of the European countries [10,11], the USA [12], Canada [13] and Australia [9]. Steptoe & Wardle [14] attempted to evaluate relations between the health locus of control and the health attitudes in the group of young people (18 to 30 years old) in 18 European countries. Our research is related to this kind of scientific exploration.

AIM

The aim of the research was to investigate relations between the health control types and health behaviors performed by the university students.

MATERIAL AND METHODS

The research was conducted in the group of 532 first-to-fifth year university students between the age of 18 and 25, studying at 9 different faculties at universities in Lublin. The faculties included medicine, dentistry, nursing, medical rescue, physiotherapy, pharmacy, public health, philosophy and pedagogy. The average age in the researched group was M=20.74 and a standard deviation was SD=1.542. Women constituted most of the sample 77.44% (N=412). Men constituted 22.56% (N=120) of it. Our research was conducted, among other things, among the students of faculties traditionally dominated by women (nursing, dentistry, pedagogy and pharmacy). Most of the enquired people ceme from the countryside 34.02% (N=181) and small towns up to 50 thousand of inhabitants 26.5% (N=141). Students coming from the cities up to 50-100 thousand of inhabitants constituted 18.23% (N=97) and the students coming from agglomerations with population above 100 thousand inhabitants – 21.24% (N=113).

Two questionnaires were used in the survey: the Multidimensional Health Locus of Control Scale (MHLC) developed by Wallston, Wallston and DeVellis [2] adapted to Polish situation by Juczynski [15], and the Inventory of Health Behaviors (IHB) by Juczynski [15]. The survey was carried out from April to June 2009.

The Multidimensional Health Locus of Control Scale, in A and B forms (they are considered to be equally valid), consists of 18 statements and allows to evaluate three dimensions of the health locus of control, namely:

1. Internal Health Locus of Control (IHLC);
2. Powerful Others Health Locus of Control (PHLC), and
3. Chance Health Locus of Control (CHLC) [16].

The results are calculated separately for each of three dimensions by summing up scores. The results for each dimension range from 6 (minimum) to 36 (maximum). Form B of the MHLC scales was used in the survey.

The Inventory of Health Behaviors (IHB) allows estimating practicing various kinds of health behaviors categorized into four groups:

1. Diet habits (eating vegetables, fruit and whole meal bread; limiting consumption of food containing preservatives, salt and sugar);
2. Preventive behaviors (regular attending medical examinations, complying with physician's recommendations, improving the knowledge on health and illnesses);
3. Positive psychical attitude (avoiding: strong emotions, anger, fear and depressive situations; maintaining relationships and a positive attitude to life); and
4. Health practices (habit of a daily relax, sleep, body weight control and limiting the amount of cigarettes). According to the recommendations of author's scale, results are estimated for each of the dimensions by calculating the average of the points in each dimension: the sum is divided by 6. The range of calculated results for each of the inventory's dimension is within the range from 1.0 (minimum) to 5.0 (maximum) [15].

The data were analyzed on three levels. The first level is the analysis of health control intensity and health-oriented attitudes in the whole group of enquired students. The correlations between variables of the MHLC and the IHB scales were calculated by using the Pearson's correlation coefficient. On the second level, the differences between women and men in regard to evaluated variables were analyzed by Student's t-Tests. The aim of the third level analysis was to determine (using k-means clustering analysis and the analysis of variance (one-way ANOVA)) how people of different types of health locus of control function in respect to the health-oriented behavior. The statistical analyses were performed with Statistica Version 6.0 (StatSoft Poland) and SPSS Version 16.0 (SPSS Poland).

Approval was obtained from the Bioethics Committee at Medical University of Lublin (KE-0254/224/2008) prior to this research.

RESULTS

The analysis of the results obtained for the whole group (Table 1) shows that health behaviors correlate most strongly with the PHLC dimension. The higher result in the PHLC dimension was obtained, the higher were the results in the following three dimensions: preventive behaviors, positive psychical attitudes and health practices.

Data obtained were analyzed with regard to the gender (Table 2). It appeared that statistically significant differences between the group of women and the group of men exist (according to the IHB scale) in intensity of proper dietary habits and the intensity of preventive behaviors. There were no

TABLE 1. Reliability coefficients (Cronbah's alpha), health control (MHLC scale) and health-oriented behaviors (IHB scale) Pearson's correlation.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				MHLC			
Internal Health Locus of Control (IHLC) (1)	**α=0.619**						
Powerful Others Health Locus of Control (PHLC) (2)	0.232(**)	**α=0.675**					
Chance Health Locus of Control (CHLC) (3)	0.065	0.177(**)	**α=0.545**				
				IHB			
Good dietary habits (4)	0.099(*)	0.055	-0.032	**α=0.767**			
Preventive behaviors (5)	0.134(**)	0.273(**)	-0.009	0.537(**)	**α=0.659**		
Positive psychical attitude (6)	0.193(**)	0.265(**)	0.001	0.411(**)	0.491(**)	**α=0.686**	
Health practices (7)	-0.001	0.089(*)	0.015	0.516(**)	0.407(**)	0.500(**)	**α=0.551**

Note. Correlation coefficient (r). Significance level (p): * (p<0.05); ** (p<0.01)

statistically significant differences between women and men with regard to three types of health control on the MHLC scale.

A difference of health behaviours between men and women was noticed. For example, with reference to smoking cigarettes Baş et al. claimed, "The prevalence of current smoking was found to be 22.2% for males and 18.2% for females. In addition, 29.6% of the males and 37.6% of the females were physically inactive (p<0.05); however, male adolescents (48.2%) were significantly more likely than female adolescents (52.1 %) to report sufficient moderate physical activity (p<0.05)" [16]. The differences also occurred in many different behaviour styles, such as doing exercises or general sense of having control over someone's own health.

TABLE 2. Gender differences in reference to health control (MHLC scale) and health behaviors (IHB scale). Student's t-Tests.

Variables	Women		Men		t	p
	M	SD	M	SD		
			MHLC			
Internal Health Locus of Control (IHLC)	25.78	4.334	26.05	3.948	-.618	.537
Powerful Others Health Locus of Control (PHLC)	21.74	5.011	21.77	4.832	-.058	.954
Chance Health Locus of Control (CHLC)	19.66	4.797	19.58	5.617	.146	.884
			IHB			
Good dietary habits	3.21	.702	2.91	.699	4.218	.001
Preventive behaviors	3.15	.696	2.91	.802	3.148	.002
Positive psychical attitudes	3.33	.664	3.35	.732	-.316	.752
Health practices	3.17	.674	3.08	.718	1.208	.227

Note. Mean (M). Standard deviation (SD). Significance level (p).
Bold type indicates differences reached significance at p<0.005.

The typology of the studied group was done using the k-means clustering. This method allows dividing a set of studied people or properties without any previously existing external criterion. Four different clusters of students – differentiating with regard to the health locus of control – were distinguished due to using this method.

According to Juczynski's [15] suggestion regarding MHLC authors' division of the scores into high and low, the clusters can be defined as it is shown in Table 3. Classification of the results obtained in each of the cluster (Table 3) was done with regard to the means (M) of each dimension that were calculated for the whole group. Normal distribution of the obtained results and the similar values of mean and median for each of the dimension were observed in the studied sample.

TABLE 3. Health control types differentiated in k-means clustering analysis of three dimensions of MHLC scale (Internal Health Locus of Control – IHLC; Powerful Others Health Locus of Control – PHLC; Chance Health Locus of Control – CHLC).

Cluster number	The dimension of MHLCS	N	Min.	Max.	M	SD
Cluster 1	IHLC	131	19.0	34.0	27.20	3.621
health control type that diminishes influence of chance	PHLC	131	16.0	31.0	23.22	3.271
	CHLC	131	7.0	20.0	14.73	2.801
Cluster 2	IHLC	162	12.0	36.0	24.04	4.072
health control type that intensifies influence of chance	PHLC	162	11.0	25.0	19.79	3.234
	CHLC	162	18.0	33.0	23.00	3.031
Cluster 3	IHLC	89	7.0	33.0	23.33	4.408
weak undifferentiated health control type	PHLC	89	6.0	21.0	15.11	3.082
	CHLC	89	7.0	23.0	15.30	3.352
Cluster 4	IHLC	150	20.0	36.0	28.10	3.066
strong undifferentiated health control type	PHLC	150	19.0	34.0	26.50	2.559
	CHLC	150	18.0	31.0	22.88	3.163

Note. Number of respondents (N). Mean (M). Standard deviation (SD)

Then, four clusters (Health Control Types – HCTs) were compared with IHB scales in order to define whether the differentiation of beliefs concerning health control influences the type and intensity of behaviors promoting positive health habits (Figure 1). Statistically significant differences (using the analysis of variance – ANOVA) appeared in three out of four IHB scales (Table 4). The difference among distinguished types of health control exists with regard to

TABLE 4. Health-oriented behaviors performed by people exhibiting different health locus of control (results of ANOVA analysis).

Variables	Cluster 1		Cluster 2		Cluster 3		Cluster 4		F	p	Post hoc tests
	M	SD	M	SD	M	SD	M	SD			
Good dietary habits	3.18	.701	3.03	.690	3.15	.781	3.24	.692	2.540	.050	2<4
Preventive behaviors	3.23	.738	2.95	.720	2.84	.665	3.28	.690	11.138	.001	1>2; 1>3; 2<4; 3<4
Positive psychical attitudes	3.41	.649	3.22	.609	3.04	.741	3.56	.659	13.875	.001	1>3; 2<4; 3<4
Health practices	3.13	.689	3.10	.670	3.13	.784	3.24	.629	1.164	.323	not significant

Note. Mean (M). Standard deviation (SD). Significance level (p).

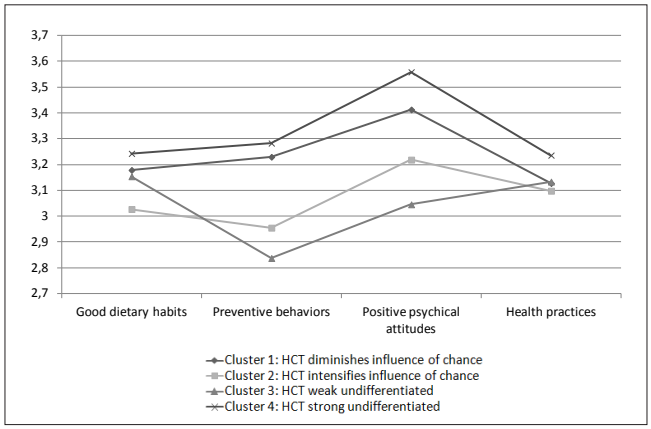

FIGURE 1. Graphic presentation of intensity of the health behaviors (according IHB scale) performed by students belonging to different Health Control Types (HCTs).

good dietary habits (F=2.540; p=0.050), preventive behaviors (F=11.138, p=0.001) and positive psychic attitudes (F=13.875, p=0.001). No differences were found with regard to health practices.

DISCUSSION

In the light of the analysis of the data collected in our research, it should be stated that the internal health locus of control belief is predominant among students. The domination exists in the entire studied group as well as in all of four distinguished health control types (Table 3). Research carried out in the late 1990s in the group of Polish students (N=97) indicated the existence of the strong internal control (IHLC: M=28.61, SD=3.73) and much weaker beliefs concerning the influence of others on one's health (PHLC: M=18.76, SD=4.19), or beliefs concerning the influence of chance (CHLC: M=15.65, SD=5.12) [15]. The results of the research conducted on students from 18 European countries (N=7115) in the late 1990s [14] were similar with regard to PHLC and CHLC to the results of the Polish research conducted among the students. However, the mean value for the IHLC (M=24.1; SD=4.3) was significantly lower than the mean obtained in Polish research in the similar period.

To what degree are the differences of health practices (that were observed in our research) dependent on the internal health locus of control (IHLC) – that is suggested by many previous studies – and to what degree are they dependent on the influence of other people (PHLC)? The people representing strong undifferentiated health control type and these representing the type diminishing the influence of chance demonstrate the greatest commitment to preventive, prophylactic practices (Table 3). The lowest mean of intensification of prophylactic behaviors was noticed in case of the weak undifferentiated type. In this case, there is the greatest disproportion between the internal control and the influence of other people. It is worth noticing that high values of the internal control (IHLC) do not collide with the regular attendance to prophylactic medical tests, especially, if within a given type they coexist with a strong belief that the health status is also influenced by other people (Table 3). It occurs in case of strong undifferentiated health control type (PHLC=26.500) and the health control type that diminishes the influence of chance (PHLC=23.218). The rightness of suggestion that the influence of other people (PHLC) is the main variable modifying prophylactic behaviors is confirmed by the statistically significant and quite clear correlation between PHLC and prophylactic behaviors (r=0.273, p<0.01) (Table 1). The internal health locus of control should be suggested as a factor modifying prophylactic behaviors only in the second place, for its correlation with these behaviors is weaker (r=0.134; p<0.01) (Table 1) and the disproportions between four types of health control with regard to the IHLC is also weaker than in case of the PHLC.

Previous theoretical analyses and research conducted on various age groups indicate the possibility of some diversity within the health locus of control assessed with the MHLC scales. Wallston [17] suggested that eight possible types of the health control exist: (a) pure internal; (b) pure powerful others external; (c) pure chance external; (d) double external; (e) belief in control; (f) yea sayer; (g) nay sayer; and (h) an unnamed Type VI (high Internal and Chance combined with low Powerful Others scores, a profile type considered unlikely to occur). By contrast, Rock et al. [18] distinguished, and then verified in a group of students, six types of the health locus of control, namely, (a) pure internal; (b) double external; (c) pure chance; (d) yea sayer; (e) nay sayer, and (f) believer in control. Wiegmann and Bergen (1998) obtained similar results [19]. They analysed the health locus of control among workers suffering from accidents at work. An analysis of clusters distinguished the following clusters in the group: (a) pure powerful others; (b) yea-sayers; (c) believers in control; (d) pure chance; (e) pure internal.

The research indicates that the numbers of distinguished types of the health locus of control may be different but a more detailed analysis suggests that there are some similarities among them, e.g. in each case the individuals with the strong internal health locus of control and so called yea-sayers occur. Furthermore, all classifications include the individuals with the strong external locus of control.

The next dimension of the IIHB scales within which the distinct and significant differences between various types

of control have been noticed, is the dimension of positive psychic attitudes. With regard to this dimension, relations between various types of health control are really similar to the relations noticed in case of prophylactic behaviors. The influence of PHLC is the main factor modifying the intensity of the positive attitude also in this case – there is a strong correlation between the PHLC and psychic attitudes ($r=0.265$; $p<0.01$).

No statistically significant differences among four types of health control with regard to health practices were noticed. However, it may be suggested that also in this dimension of the IHB scales there is a positive relation between the intensity of the PHLC belief and health oriented behaviors. For there is a weak but statistically significant correlation between the intensity of the health practices and the PHLC ($r=0.089$; $p<0.05$). This observation can be explained by the fact that students who score high in the PHLC dimension are susceptible to adopting positive exemplars with regard to health behaviors. It may be of essential importance to the health education, too. Students demonstrating stronger beliefs in the influence of others (PHLC) should assimilate the knowledge of health behaviors more easily.

Four dimensions of the IHB scales (good diet habits, preventive behaviors, positive psychical attitude, and health practices) reflect main directions of health education and promotion of health. In the view of the discussion of the research results, some practical recommendations for the specialists teaching and promoting health behaviors can be suggested. The MHLC scale seems to be especially useful to evaluate students' willingness to take up preventive, prophylactic behaviors. Thus, the MHLC scale in the introductory phase of health promotion program is worth using.

CONCLUSIONS

1. Students manifest the belief that internal control (IHLC) prevail over external sources of health control (PHLC, CHLC).
2. In the studied group, women exhibit significantly greater intensification of good diet habits and preventive behaviors.
3. Main factor modifying preventive behaviors performed by researched students is the belief in the influence of other people on the students' health status.
4. The MHLC scale may be a useful instrument allowing estimation of university students' resistance and susceptibility to health promotion.

REFERENCES

1. Rotter JB. Generalized expectancies for internal versus external control of reinforcement. Psychol Monogr. 1966;80(1).
2. Wallston KA, Wallston BS, DeVellis RF. Development of the Multidimensional Health LOC (MHLC) Scales. Health Educ Monogr. 1978;6:160-70.
3. Wallston KA. Multidimensional Health Locus of Control (MHLC). Scales; 1978. [http://www.vanderbilt.edu/nursing/kwallston/mhlcscales.htm]
4. Luszczynska A, Schwarzer, R. Multidimensional Health Locus of Control: Comments on the Construct and its Measurement. J Health Psych. 2005;10(5):633-42.
5. Masters KS, Wallston KA. Canonical correlation reveals important relations between health locus of control, coping, affect and values. J Health Psych. 2005;10:719-31.
6. Acharya S. Professionalization and Its Effect on Health Locus of Control Among Indian Dental Students. J Dent Educ. 2008;72(1):110-5.
7. Acharya S, Sangam DK. Oral health-related quality of life and its relationship with health locus of control among Indian dental university students. Eur J Dent Educ. 2008;12:208-12.
8. Shamsedden W, Mahmoud H, Otrock Z, AfifiSoweid R. Health Locus of control among medical students in a developing country. Int J Health Promot Educ. 2006;44:145-51. [http://findarticles.com/p/articles/mi_6793/is_4_44/ai_n28405795]
9. Trankle SA, Haw J. Predicting Australian health behaviour from health beliefs. Elec J of App Psychol. 2009;5(2):9-17.
10. Steptoe A, Wardle J. Health behaviour, risk awareness and emotional well-being in students from Eastern Europe and Western Europe. Soc Sci Med. 2001;53:1621-30.
11. Steptoe A, Wardle J, Cui W, et al. Trends in Smoking, Diet, Physical Exercise, and Attitudes Toward Health in European University Students from 13 Countries, 1990-2000. Prev Med. 2002;35:97-104.
12. Pasch KE, Perry CL, Stigler MH, Komro KA. Sixth grade students who use alcohol: do we need primary prevention programs for "tweens"? Health Educ Behav. 2009;36(4):673-95.
13. Christiansen M, Vik PW, Jarchow A. College student heavy drinking in social contexts versus alone. Addictive Behav. 2002;27:393-404.
14. Steptoe A, Wardle J. Locus of control and health behavior revisited: A multivariate analysis of young adults from 18 countries. Br J Psychol. 2001;92:659-72.
15. Juczynski Z. Narzędzia pomiaru w promocji i psychologii zdrowia. Warszawa: Pracownia Testów Psychologicznych Polskiego Towarzystwa Psychologicznego; 2001.
16. Baş M, Altan T, Dinçer D, et al. Determination of dietary habits as a risk factor of cardiovascular heart disease in Turkish adolescents. Eur J Nutr. 2005;44(3):174-82.
17. Wallston KA. Overview of the Special Issue on Research with the Multidimensional Health Locus of Control (MHLC) Scales. J Health Psychol. 2005;10(5):619-21.
18. Rock, DL, Meyerowitz BE, Maisto SA, Wallston KA. The derivation and validation of six multidimensional health locus of control scale clusters. Res Nurs Health. 1987;10(3):185-95.
19. Wiegmann SM, Bergen NL. Health Locus-of-Control Beliefs and Improvement in Physical Functioning in a Work-Hardening, Return-to-Work Program. Rehabil Psychol.1998;43(2):83-100.

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