The profile of Sense of Positive Health and Survival Abilities indices (subjective assessment) as a diagnostic tool used in health-related training

Roman Maciej Kalina

Faculty of Physiotherapy, Department of Health Promotion & Research Methodology, Academy of Physical Education, Katowice, Poland

Abstract

Background and Study Aim: The main objective of the article is a methodic of the profile of the sense of positive health and survival abilities indices in relation "patient (client) personal trainer (leader)". The objective of empiric sphere was the profile based on subjective assessment of young women possessing different level of everyday physical activity. The question is whether there is a significant difference in the profile of sense of positive health indices in all its dimensions and own survival abilities between young women who declare engagement in everyday physical activity and their peers, who are occasionally active?

Material/Methods: The profile based on the subjective sense of various positive health indices covers three dimensions: somatic A, mental B, social C and D dimension, which represents sense of indices and assessment reflecting individual's survival abilities. The sense of intensity of particular indices is evaluated in the 1 to 5 scale (where its value is as follows: 1 very low, 2 low, 3 average, 4 high, 5 very high). The "0" index is used for the purpose of evaluation of specific abilities (D dimension). The arithmetic mean of indices (after decomposition to diagnostic values) calculated for particular dimensions (from A to D) constitutes a general measure of a given health dimension and survival abilities. The arithmetic mean calculated for A to D indices represents the most general index of Sense of Positive Health and Survival Abilities (SPHSA).

The study group consisted of 23-year old female students of the 2-cycle university program in physiotherapy, (22 declared engagement in everyday physical activity whereas 100 were occasionally active).

Results: Women who reported engagement in everyday physical activity possess higher values of SPHSA than their peers, who are occasionally active (respectively 3.641 and 3.479; p<0.05). The highest value was recorded for social health sense (4.12 and 4.14), whereas the lowest value was noted for the survival abilities (2.956 and 2.828). Students who are active on daily basis possess statistically higher values than women who occasionally engage in physical activity as far as the following indices are concerned: muscular strength (p<0.01) and aerobic capacity, reduced aggressiveness, swimming ability, precision skills in various status of organism (p<0.05).

Conclusions: From the methodological point of view the assumption that the profile indices do not directly reflect the sense of health but rather the imaginative value of a specific virtue, ability etc. proved positive. Diversification of assessment is higher in the case of indices, for which the reliability of an individual's assessment is considered to be relatively high (especially in the A, B and D dimensions).

Key words: effort safety • motor safety • mental health • social health • somatic health

Author's address: Roman Maciej Kalina, Faculty of Physiotherapy, Department of Health Promotion & Research Methodology, Academy of Physical Education, Mikołowska Street 72A, 40-065 Katowice, Poland; e-mail: kom.kalina@op.pl

Complementary health related training – is coherent system of using such methods and means which affects body in complex way. The most valuable ones are those which stimulate all health dimensions (somatic, mental and social health), motor and strain safety, and develop wide range of motor survival competences [9].

Effort safety – is consciousness of the person who starts physical effort or consciousness of the subject who has the right to encourage or even enforce from this person the physical effort of a certain intensity and duration, who it is able to do so without risking life or health [9].

Motor safety – is consciousness of the person undertaking to solve a motor task or consciousness the subject who has the right to encourage and even enforce from this person that would perform the motor activity, who is able to do it without the risk of the loss of life, injuries or other adverse health effects [9].

Health education – persuasive methods used to entourage people (either individually or collectively) to adopt life styles that the educators believe will improve health and to reject habits regarded as harmful to health or likely to shorten life expectancy. The term is also used in a broader sense to include instruction about bodily function, etc., so that the public is better informed about health issues [21].

Background

In the praxeology it is essential, that effective engagement in any training is possible only when there is an option of monitoring of its effects by the means of some quantitative measure, sometimes even the primitive one [1, p. 253]. The term "training" is being used in connection with many other words. Mainly it describes the activity which is performed on regular basis with the objective of obtaining and mastering certain abilities and skills (*sports training, military training, rescue team training etc.*). The term is also used to describe not only the abilities (skills), but rather the status of organism within the more complementary meaning, which can be interpreted in many ways, especially in the psychological concept of transgression [2]: *sensitivity training, interpersonal training* etc. Improvement and/or maintenance of health in its all dimensions (somatic, mental, social) as well as its evaluation in broadly defined dimension are the examples of modern attitude, typical for a citizen of Knowledge Society [3]. Therefore the term *health-related training* seems to be a well-chosen one for the description of general activities which are undertaken either for the purpose of health maintenance, its improvement or restoration and also for the purpose of limiting the effects of involutional changes in the elderly.

Therefore the lack of understanding for the word „training" seems odd, when it is used for the description of activities performed on regular basis for the health related reasons, regardless of the word context, either wide or narrow (usually connected with somatic or biological dimension). The lack of understanding for the word "training" may result from its association with extreme physical effort, pain, fatigue, the need of fitness club membership, the use of sophisticated equipment etc. [4,5]. In my opinion such attitude is caused by electronic media, especially commercials and exposure to extreme modes of movement. Such an attitude indicates the lack of knowledge of health care behaviour.

The issue of low level of health care awareness (in the global scale) needs to be separately addressed. Regularly published WHO reports and many other scientific publications indicate inform about the risk factors responsible for deterioration of health (drug addiction, alcoholism, work addiction, sedentary life style, unhealthy diet, hunger, stress), but on the other hand they show its results (obesity, hypertension, myocardial infarctions, strokes, suicides, robbery, interpersonal aggression etc.). There is however a lack of articles indicating systemic implementation, which could bring globally experienced positive effects or such effects in the nearest future, and even in the further prospective.

In the world scientific literature (published in periodicals cited by the most important literature bases: ISI Web of Science, Scopus), which focus on health care promotion, there is no article which would globally address predictable health-related effects (in all dimensions) of implementation of traditional martial arts such as judo, kendo or sumo in schools in Japan. With my colleagues [6] we addressed in general only the issue of effects of safe fall teaching (as a part of judo classes), having in mind its prospective role in falls prevention among elderly. It is completely justifiable to say that Japan is the country in which the rate of death and body injuries in elderly caused by falls and impact on ground and other obstacle will be considerably limited in the future.

In this context, the system of evaluation of biological development and physical fitness among adolescents introduced in Slovenia (SLO FIT) is worth noting [7]. On the grounds of this program the appropriate national institutions intervene where the conditions for stimulation of development in adolescents is not adequate. In my opinion the primary and secondary schools should be the most important institutions responsible for propagation of healthy lifestyle habits. Unfortunately in many countries this is not the case. Physical education classes commonly linked to health care education, which focus mainly on physical exercises, become denial of its name and health care's mission. PE classes (usually 45-50 minutes long) fall between other classes. Since breaks between classes are usually 10 minutes long, there is no enough time for hygienic procedures (shower, hair drying etc.), fluid supplement and rest, that would allow mental focus necessary for active participation in subsequent classes such as mathematics, physics, chemistry, geography, history [8, 9]. These are just a few examples.

Considering the above we posed a rhetorical question: Why so many adults do not possess adequate health-oriented awareness and lifestyle habits, including regular self-monitoring and professional control of health-related indices (at least related only to somatic dimension)?

The introduction of alternative and in some respects opened systems of permanent health care education seem to be a proper solution. In my opinion the development of such systems should be based on two hypotheses. The first one assumes that this is the family (a preferably a multigenerational one), which constitutes the adequate reference system for the permanent *health-related training*. Family is a main subject, at which health-related activities are directed in the complementary way. The second one assumes that the success of mission and obtaining of aims in *complementary health-related training* [9] is based on confidence of an educated subject (a family, a single person) to the one which

Table 1. Way of using questionnaire SPHSA (subjective assessment).

Profile of Sense of Positive Health and Survival Abilities indices

/X subjectively estimated indicator   ○ empirically diagnosed indicator/

/female student among active on daily basis with the highest SPHA indicator/

....   AWF Katowice   21.10.2011

Surname first name or pseudonym (code)   place   date

age [year] **23**   height [cm] **168**   weight [kg] **58**   sex: M Ⓕ

physical activity: occasionally ☐   daily basis ☒   sport(s) snowboard acrobatics (sport), volleyball

estimated value of the index [contractual points]:

(0) lack of ability   (1) very low   (2) low   (3) average   (4) high   (5) very high

Dimension		Indicator	Evaluated index [X/○]					
			0	1	2	3	4	5
A	somatic health	BMI				X	→5	
		Resting HR				X		
		Systolic blood pressure				X	→5	
		Diastolic blood pressure				X	→5	
		Aerobic capacity					X	
		Anaerobic capacity					X	
		Muscle strength					X	
		Flexibility					X	
		the arithmetic mean of points:	X **4,25**			○		
B	mental health	Aggressiveness			X	→4		
		Sense of fear		X	→5			
		Stress coping skills					X	
		Tolerance					X	
		the arithmetic mean of points:	X **4,333**			○		
C	social health	Respecting „fair play" rule					X	
		Respecting supreme values						X
		Responsibility					X	
		the arithmetic mean of points:	X **4,25**			○		
D	survival abilities	Body balance disturbance tolerance skills						X
		Precision skills before and during activity						X
		Safe falling skills					X	
		Self-defence skills					X	
		Swimming ability					X	
		Lifesaving skills in water				X		
		First aid skills					X	
		Survival abilities in solitude					X	
		the arithmetic mean of points:	X **4,125**			○		

General positive health profile and survival abilities [X/○ arithmetic means indicators]

Dimension		0,5	1	1,5	2	2,5	3	3,5	4	4,5
A	Somatic health								✕	
B	Mental health									✕
C	Social health								✕	
D	Survival abilities								✕	

Sense of Positive Health and Survival Abilities: SPHSA [arithmetic mean A+B+C+D]   X **4,24**   ○ ....

provides the health-related education services. In general these assumptions exclude school as an institution which could undertake such a task, at least in the perspective of one generation.

The option of easy verification of efficiency and reliability of such system is indispensable for both the trainer (leader) and his employer. In a sense this concept resembles traditional "*Master-Student*" ("*Employer-Trainer*") system. If such association comes up, it is appropriate to focus on the thesis, that health is too important issue to be confided to somebody who is not prepared for this task. Modernity brings a new quality to this traditional system and gives the tools and options for permanent

Non-apparatus test – that motoric test (exercise endurance test) of the required reliability (accurate and reliable), which use does not require even the simplest instruments [18].

Quasi-apparatus tests – that motoric test (exercise endurance test) of the required reliability (accurate and reliable), which can be conducted with simple instruments (a stopwatch, a ruler, a measuring tape, etc.) [18].

Positive health – a concept of health related to the quality of life and to the capability possessed by an individual. This term relates more to the development, than to the simple coping skills. In the physiological context it may be perceived as a state which is characterized by: A) the absence of the disease; b) low level of the severity of risk factors of the civilization diseases; c) an adequate capacity of adaptive mechanisms responsible for the control of the external environment, the physical effort in particular [14].

Table 2. Way of the disintegration (of transforming and documenting) of indicators declared to diagnostic values.

Dimension	Indicator	\[X/O\] 0	1	2	3	4	5
A somatic health	**BMI**				X		→5
				2←		X	
			1←				X
	Resting HR		X				→5
					X	→4	
				2←	X		
			1←				X
	Systolic blood pressure				X		→5
				2←		X	
			1←				X
	Diastolic blood pressure				X		→5
				2←		X	
			1←				X
B mental health	**Aggressiveness**		X				→5
					X	→4	
				2←	X		
			1←				X
	Sense of fear		X				5
					X	→4	
				2←	X		
			1←				X

(Header: Evaluated index [X/O])

distant verification of the "*Master*" *and* "*Student*" competences. The "EKO-AGRO-FITNESS" is the example of such system [9].

Regardless of the final form of the *health-related training,* the periodical evaluation of health in its all dimensions and survival abilities should constitute a foundation of a reasonable activity. Numerous and large catastrophes from the last years and expansion of the terrorism show the need for supplementation of the traditional thinking about health care with survival abilities element [9].

The main objective of this paper is a methodic of the profile of the sense of positive health and survival abilities indices – SPHSA (used in EKO-AGRO-FITNESS system) [9] as a diagnostic tool used in health-related training in relation "patient (client) – personal trainer (leader)". The objective of empiric sphere was the profile based on subjective assessment of young women possessing different level of everyday physical activity. The question is whether there is a significant difference in the profile of sense of positive health indices in all its dimensions and own survival abilities between young women who declare engagement in everyday physical activity and their peers, who are occasionally active?

MATERIAL AND METHODS

The profile based on the subjective sense of various positive health indices covers three dimensions: somatic A, mental B, social C and D dimension, which represents sense of indices and assessment (not all are subjective, since an individual usually is aware of the fact that he can swim) reflecting individual's survival abilities (Table 1).

The sense of intensity of particular indices is evaluated in the 1 to 5 scale, where its value is as follows: 1 very low, 2 low, 3 average, 4 high, 5 very high. Additionally the "0" index is used for the purpose of evaluation of specific abilities (D dimension). Indices 1 to 5 are based on the assumption that the question does not address the assessment of health status sense, but rather the imaginative value of a specific virtue, ability etc. In this way the odds of elimination of assessment based on the inner belief (more or less positive) and sometimes on the expectation regarding own health status are higher. The higher the number of indices used, especially the ones in which the true diagnostic value extremely differ from the sense of a given virtue, skill or survival ability, the more reliable is the evaluation performed (for example number 5 indicates very low status of health and number 2 indicates high value of health self-esteem etc.). Therefore it is recommended not to explain the respondent the true diagnostic value of a given virtue, but rather make him select a certain number from the available scale according to what he experiences (senses) or to what he really feels. If a respondent is sure that his heart rate is usually very low, he is to mark X in the 1 column in the section "Evaluated index" [X/O]".

Secondary calculation of indices, so its decomposition into diagnostics values and also the interpretation of

Table 3. Estimation of the main empirical variables in the groups of female physiotherapy students (23 years old).

Empirical variable	W_{100} (occasionally physical activity) (n=100)						W_{22} (physically active on daily basis) (n=22)					
	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2
Height [cm]	166.82	5.32	157	179	0.10	−0.79	167.65	5.76	150	178	−0.36	0.32
Weight [kg]	58.4	7.04	42	82	0.44	0.83	60.2	6.98	46	76	0.20	−0.22
SPHSA (points)*	3.479	0.38	2.281	4.469	−0.24	1.04	3.641	0.34	3.219	4.240	0.24	−0.95
A somatic health (points)	3.263	0.47	1.875	4.375	−0.52	0.04	3.523	0.60	2.125	4.25	−0.83	0.00
B mental health (points)	3.685	0.59	2.250	5	0.02	−0.30	3.898	0.43	3	4.75	−0.02	−0.30
C social health (points)	4.140	0.59	1	5	−1.55	7.01	4.121	0.54	3	5	−0.66	0.01
D survival abilities (points)	2.828	0.59	1.375	4	−0.25	−0.48	2.956	0.52	2.125	4.125	0.32	−0.44

* $p < 0.05$
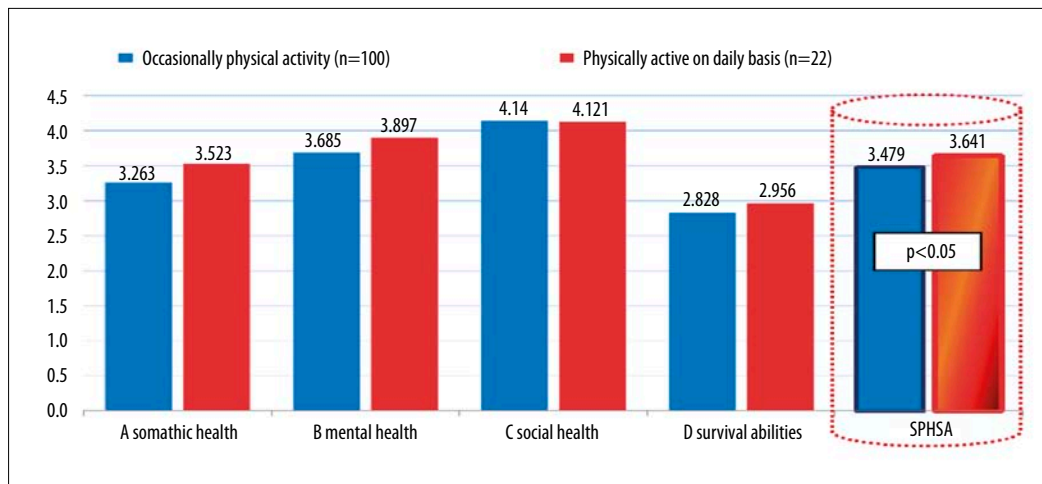
Figure 1. General profiles of the positive health and abilities to survive the students of physiotherapy differing in the frequency of physical activity.

all indices and assessments is the domain of trainer/leader of health-related preparation. Table 2 shows the values of indices declared according to the employed methodics, which will be later transferred into true diagnostic values.

The arithmetic mean of assessed indices (after their decomposition into diagnostics values) calculated for particular sets (from A to D) constitutes a general measure of a given health dimension (sphere) and survival abilities. The aim of the section "general positive health profile and survival abilities" is to visualize graphically the obtained results (Table 1). If the index which is empirically diagnosed O matches the index assessed subjectively and marked as (X) by the patient/client, then it proves that a given individual possesses a very high sense of a given index of general health profile or survival abilities. The comparison of profile declared with the profile diagnosed should be preceded by a decomposition

of some of the indices declared into diagnostic values according to instructions shown in Table 2.

Investigated persons

To eliminate the effects of age difference factor (which is usually affected by the life experience as the age progresses) I surveyed 23-year old female students who, considering the age, constituted the most numerous group of female students of the 2-cycle university program in physiotherapy. The study group consisted of 100 women, who were occasionally active (group W_{100}) and 22 who engaged in everyday physical activity (group W_{22})

RESULTS

Women from W_{22} group possess higher values of SPHSA than their peers from W_{100} group (respectively 3.641- and 3.479 points; $p < 0.05$) (Table 3; Figure 1). The highest

Table 4. Estimation of somatic health subjectively evaluated by two groups of female physiotherapy students (23 years old) possessing different level of physical activity – the order of variables compliant to the SPHSA questionnaire.

| Empirical variable (points)	W_{100} /occasionally physical activity/ (n=100)						W_{22} (physically active on daily basis) (n=22)					
	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2
BMI	3.84	1.54	1	5	−0.61	−1.54	4.227	1.478	1	5	−1.50	0.46
Resting HR	3.01	0.54	2	5	0.79	3.48	2.864	0.774	1	4	−1.10	1.85
Systolic blood pressure	4.07	1.44	1	5	−0.94	−1.04	4.091	1.540	1	5	−1.20	−0.44
Diastolic blood pressure	3.97	1.45	1	5	−0.73	−1.41	4.136	1.457	1	5	−1.17	−0.53
Aerobic capacity*	2.71	0.64	1	4	−0.36	0.30	3.136	0.941	1	5	−0.29	0.03
Anaerobic capacity	2.72	0.60	1	4	−0.63	0.71	3	0.926	1	5	0.00	0.14
Muscle strength**	2.96	0.68	1	5	0.25	1.05	3.455	0.683	2	4	−0.86	−0.32
Flexibility	2.82	0.94	1	5	−0.08	−0.46	3.273	1.032	1	5	−0.32	−0.28

* $p < 0.05$; ** $p < 0.01$
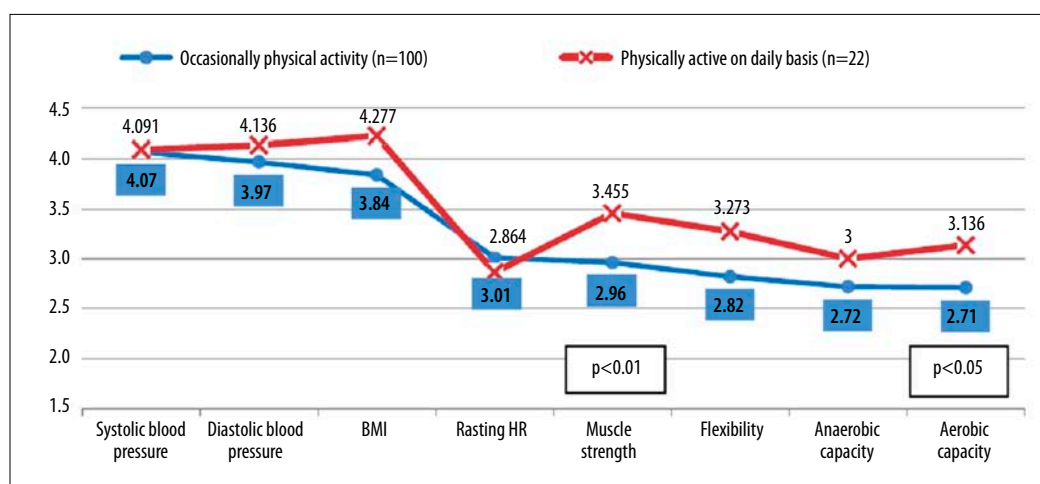
Figure 2. Declared values of indicators of the somatic health the students of physiotherapy (ordinal variable: diminishing values of indicators of occasionally active women).

value was recorded for social health sense (4.12- and 4.14 points), whereas the lowest value was noted for the survival abilities (2.956- and 2.828 points). Students who are active on daily basis possess statistically higher values than women who occasionally engage in physical activity as far as the following indices are concerned: muscular strength ($p < 0.01$) (Table 4, Figure 2) and aerobic capacity, reduced aggressiveness, swimming ability, precision skills in various status of organism ($p < 0.05$) (Tables 4–6; Figures 2–4).

The standard deviation was measure of the variability of SPHSA in all dimensions from A to C and its value was similar in both groups (Table 3). When this variability was measured with the use of the range it appeared that it was higher in women who were active occasionally. The higher value expressed by the range (4 points) was recorded for the general index of social health and

the lowest value (2.188 points) was noted in case of SPHSA. In the W_{22} group the highest value was recorded for general health profile of somatic health sense (2.125 points), and the lowest for the SPHSA (1.021 points).

The characteristics of detailed indices based on the arithmetic mean and measures of variability (SD and range) despite few statistically significant differences (5 pairs out of 23 indices) show a considerable diversification of particular measures. Among indices of somatic health (Table 4) the difference of 0.453 points of flexibility index is not of statistical significance ($p=1.895$) which results from high values of standard deviation in both groups. The range of 4 points relates to six indices (out of eight in A dimension) in W_{22} group and to five students from W_{100} group. The lowest value of range (2 points) and at the same time the lowest values of standard deviation of indices of physically active students

Table 5. Estimation of mental health subjectively evaluated by two groups of female physiotherapy students (23 years old) possessing different level of physical activity – the order of variables compliant to the SPHSA questionnaire.

Empirical variable (points)	W$_{100}$ (occasionally physical activity) (n=100)						W$_{22}$ (physically active on daily basis) (n=22)					
	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2
Aggressiveness*	4.1	0.969	2	5	−0.62	−0.70	4.455	0.671	3	5	−0.86	−0.24
Sense of fear	3.73	1.118	1	5	−0.54	−1.12	4.136	0.990	1	5	−1.59	3.56
Stress coping skills	3.03	0.937	1	5	−0.55	0.15	3.182	0.733	2	4	−0.30	−0.97
Tolerance	3.88	0.832	1	5	0.10	0.44	3.818	0.958	1	5	−1.03	2.20

* $p<0.05$

Table 6. Estimation of survival abilities subjectively evaluated by two groups of female physiotherapy students (23 years old) possessing different level of physical activity – the order of variables compliant to the SPHSA questionnaire.

Empirical variable (points)	W$_{100}$ (occasionally physical activity) (n=100)						W$_{22}$ (physically active on daily basis) (n=22)					
	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2
Body balance disturbance tolerance skills	3.06	0.76	1	5	−0.37	0.89	3.136	0.136	1	5	−0.29	0.71
Precision skills before and during activity*	2.98	0.738	0	5	−0.28	2.29	3.318	0.646	2	5	0.76	1.05
Safe falling skills	2.79	1.066	0	5	−0.49	0.62	2.600	0.883	1	4	−0.21	−0.28
Self-defence skills	2.42	0.912	0	4	−0.61	0.47	2.400	1.353	0	5	−0.13	−0.43
Swimming ability*	3.11	1.340	0	5	−0.51	−0.21	3.700	1.081	2	5	−0.32	−1.25
Lifesaving skills in water	2.22	1.276	0	5	0.05	−0.32	2.450	1.276	0	5	0.18	−0.50
First aid skills	3.21	0.880	1	5	−0.34	0.26	3.200	0.696	2	4	−0.32	−0.70
Survival abilities in solitude	2.83	1.016	0	5	−0.65	0.60	2.950	1.050	0	4	−1.48	2.86

* $p<0.05$
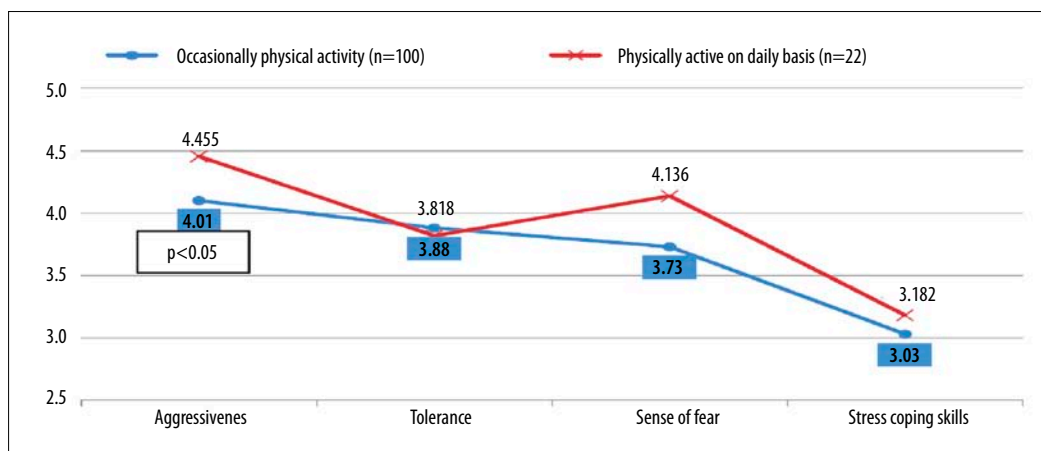
Figure 3. Declared values of indicators of the mental health by students of physiotherapy (ordinal variable: diminishing values of indicators of occasionally active women).

relates to self-esteem of muscle strength (the difference in that index between the groups reached the level of statistical significance).

Students who are occasionally active possess higher variability of indices which are used to diagnose the sense of mental health (Table 5) (three ranges out of 4 indices in B dimension amounts to 4 points). Students
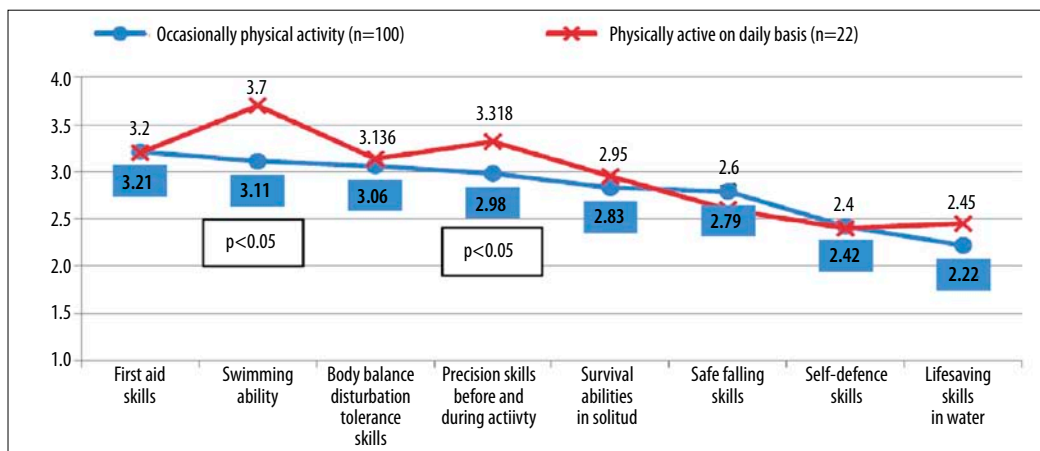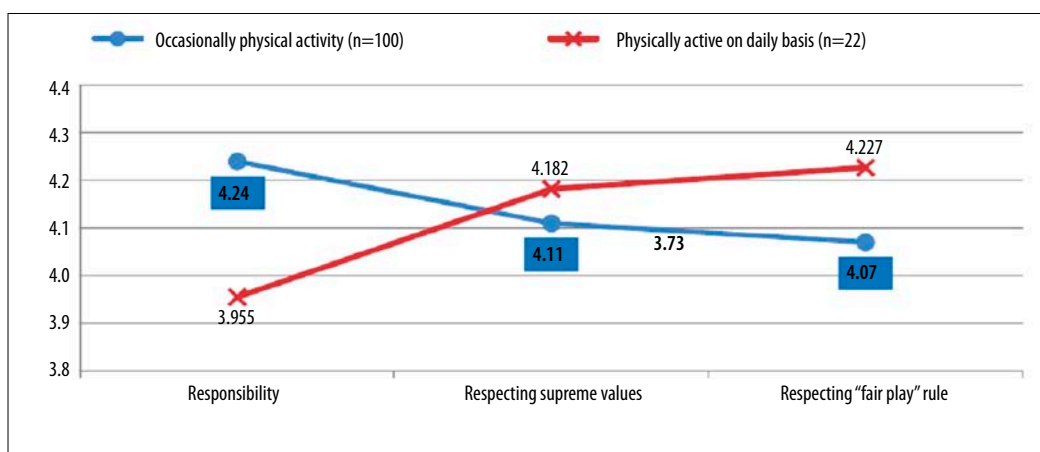
Figure 4. Declared values of rates of the ability to survive physiotherapy by students (ordinal variable: diminishing values of indicators of occasionally active women).

Table 7. Estimation of social health subjectively evaluated by two groups of female physiotherapy students (23 years old) possessing different level of physical activity – the order of variables compliant to the SPHSA questionnaire.

Empirical variable (points)	W$_{100}$ (occasionally physical activity) (n=100)						W$_{22}$ (physically active on daily basis) (n=22)					
	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2	$\overline{X}$	SD	x_{min}	x_{max}	g_1	g_2
Respecting "fair play" rule	4.07	0.714	1	5	−0.78	2.24	4.227	0.685	3	5	−0.32	−0.70
Respecting supreme values	4.11	0.709	1	5	−0.85	2.52	4.182	0.664	3	5	−0.21	−0.55
Responsibility	4.24	0.668	1	5	−1.15	4.34	3.995	0.653	3	5	0.04	−0.37

Figure 5. Declared values of indicators of the social health by students of physiotherapy (ordinal variable: diminishing values of indicators of occasionally active women).

who are active on daily basis are the least diversified according to the level of aggressiveness (the range of 2 points, SD=0.671) and stress coping skills (the range of 2 points, SD=0.733).

The C dimension (social health) does not constitute a factor which would statistically differentiate women (Table 7, Figure 5). The similarity of the value of standard deviation variability is high. However the range of

all indices in physically active students amounts to 2 points, whereas in the group of occasionally active women it amounts to 4 points.

The highest variability of indices refers to survival abilities (D dimension). Among students from W$_{100}$ group the range of five out of eight detailed indices amounts to 5 points, and in case of three dimensions it amounts to 4 points (Table 6). In the group of physically active

Table 8. Proportions of general health indices of SPHSA of value equal or greater than 4 points.

Group and statistical variables	SPHSA	SPHSA dimension and proportion of indices (%) ≥4 points			
		A somatic health	B mental health	C social health	D survival abilities
W_{100} (occasionally physical activity) (n=100)	7	2	35	80	3
W_{22} (physically active on daily basis) (n=22)	18.18	22.27	50	77.27	4.55
χ^2	0.24	18.78	1.72	0.007	0.14
p (df=1)		0.001	–	–	–

women that variability is lower. The range value of 5 points was noted in 2 indices, the range value of 4 was recorded also in two indices, while in the case of the remaining indices it amounted to 3 points.

In the set of main empiric variables skewness of distribution close to 0 value was noted in case of mental health (Table 3). For the set of data of students from W_{100} group, g_1=0.02, yet in women who are active on daily basis (W_{22}) g_1=–0.02. The most distinct negative skewness (g_1=–1.55) was noted in distribution of indices of social health in the group of occasionally active women (W_{100}).

Among detailed indices of somatic health (A dimension) the symmetrical distribution refers to anaerobic capacity (g_1=0), assessed subjectively by students who are active on daily basis (Table 4). The distribution of the remaining indices of that group of students possess negative skewness of moderate value. In case of students who are occasionally active the skewness value is close to 0 for the flexibility indices (g_1=–0.08). The indices of muscle strength and HR reflect right side asymmetry of moderate value, whereas the remaining ones reflects left side asymmetry of moderate value.

Except the distribution of results of tolerance index (g_1=0.10) noted in the group of occasionally active students the distribution for the remaining detailed indices of mental health (B dimension) in both groups show left side asymmetry of moderate value (Table 5). The characteristics of distribution of detailed indices of social health (C dimension) is similar, however distribution of the results of responsibility index is close to 0 (g_1=0.04) and is the property of students who are active on daily basis (Table 7).

In the case of detailed indices of survival abilities (D dimension) skewness of distribution is close to 0 for the lifesaving skills in water (Table 6). The g_1 value for students who are occasionally active amounts to 0.05, and to 0.18 in the other group. The distribution of results concerning the precision skills before and during physical effort (the group of students active on daily basis) indicates right side asymmetry of moderate value. The distributions of the remaining indices in both groups indicate left side asymmetry (negative) of moderate value.

There is only one point scale distribution (5 in Table 3 and 23 in Tables 4–7) which is distinctly leptokurtic (peaked). Such distribution was noted in case of general social health, since the kurtosis (g_2) amounts to 7.01 (Table 3). Despite the fact, that the range of that index is high and close to its maximal value (4 points) and standard deviation is not high, the range is maximally peaked. The high value of cumulation (80%) of indices of value 4 or higher plays the main role here (so the ones which reflect at least high value of averaged three detailed indices of that dimension: respecting "fair play" in everyday life, respecting the supreme values and responsibility) (Table 8).

The general index (C – social health) in the group of physically active students possess normal distribution (g_2=0.01) and its standard deviation is similar to the set of students who are occasionally active. The cumulation of averaged indices of the values of 4 points or higher is similar as well (77%) (Tables 3 and 8). The differences were observed only in the range value of 2 points, and the skewness – that distribution has lower negative value.

The highest probability of similar distribution in both groups of students refers to general index of somatic health (A dimension). Both distributions are normal and possess similar values of standard deviation and similar negative skewness (Table 3). The statistically significant difference was noted in the proportion of indices reflecting at least high level of eight averaged detailed indices of that dimension (the average of at least 4 points). Cumulation of those indices amount to 22% in the group of physically active students and only to 2% in the other group (Table 8).

Female students who are active on daily basis pointed to 28 preferable sport disciplines and physical exercises.

The most frequent choice was: cycling 45%, swimming 36%, running 32%, volleyball 27%, snowboard 23%, weight training 18%, nordic walking 13%, skiing 13%. There were two choices of basketball, climbing, combat sports, fitness, sailing.

DISCUSSION

During the pilot study in years 2008–2010 the SPHSA questionnaire was called „Profile of psychophysical adaptation (subjective assessment)", then the term „Profile of positive health and survival abilities (subjective assessment)" was introduced. Generally speaking, the set of variables was identical from the very beginning. In the first version the anaerobic capacity was not subjected to assessment. Moreover, I used the term "adaptation sphere" for the set of "dimension" variables. For the detailed variables of "aggressiveness" and "sense of fear" the terms "very high 1" and "high 2" were used.

The original versions of the questionnaire were based on two apparently false assumptions. The first one assumes that when Poles are asked about the general feeling they usually mention all or the most important indispositions. The second one is based on the assumption that declaration of individuals who possess wider knowledge about health (students of physiotherapy or recreation) should be reliable, since majority of them is familiar with the procedure and according to cultural predispositions would perform reliable self-assessment. The reliability was confirmed in the "test-retest" method. The results of the questionnaire performed after the lapse of one or two weeks were very high (r=0.895 to 0.923).

The third assumption constitutes the most important sense of the method of creating two profiles of positive health and survival abilities – firstly the one which is based on subjectively assessed indices (the declared profile), then on the ones diagnosed empirically. That assumption says that owns' health imagination (subjective assessment) may differ due to various reasons from the evaluation based on indices recommended by science. It may be easily concluded that there is a common inner belief regarding the extreme modification factors, which is based on the assumption that an individual is healthy and that an individual does not accept that there is something wrong with his health. From the other hand, there is an attitude that one is sick and expresses a fear of disease and exaggeration of even the smallest indispositions.

The results of the pilot study showed that the truthful assumptions are not good enough, when one makes a substantial methodological error in the process of diagnosis. When the command was: "Please assess in the scale from 1 to 5 *the level of adaptation* (the *health* in the

consecutive version of the questionnaire) according to the set of variables from the questionnaire", many students of Recreation Faculty were likely considerably influenced by strong inner belief about their own high disposition (capacity). In the declared profile of biological development (somatic health) by 20–24-year old students (n=20) cumulation of assessment mark very often had the distribution: six „4" and one „3" or five„4", one „5" and one „3" [10]. Therefore there was a similarity of subjectively evaluated level of majority of variables: BMI (mean value 4.00 points, range of 2–5), resting HR (3.9; 3–5) systolic and diastolic heart pressure identically (3.9; 3–5), anaerobic capacity (3.65; 3–5). The mathematical proof of the range of cumulation of marks according to the above schemes are the values of skewness (g_1) and kurtosis (g_2). For example when g_1 amounts to 0.08 for resting HR and –0.08 for systolic heart pressure declared by Recreation Faculty students it indicates that distribution of that variables was close to symmetrical. Whereas g_1 amounts to 0.08 for anaerobic capacity (already for the lower values of the variable 3.65 points) it indicates the moderately right-side asymmetry. Similar results were found in the case of age-matched (21–23-year old) female students from Recreation Faculty (n=15) form the same college [11]. It appeared that the sex, considering the similarity of educational effects, did not constitute a differing factor. So was the mode of studies (full-time and extramural studies).

The characteristics of those indices of somatic health in case of Physiotherapy Faculty students who were tested with the use of SPSHA questionnaire (see the Results section) possesses higher variability of declared evaluation marks. For example the range of the declared indices of systolic heart pressure amounts to 4 (it is located between 1 and 5 points with the mean values of 4.07 points), so g_1 of value –0.94 indicates a distinct negative skewness.

The more important conclusion from the present study is the one which says that due to the methodics of the current version of the SPHSA questionnaire now it is characterized by higher variability power of the studied subjects. Therefore the odds of precise self-assessment and higher level of certainty, that the differences between the declared profile (or specific detailed index) and that the empirically diagnosed profile result from the false imagination of a given individual regarding his own dispositions or their sphere, are now higher. The change of the content of the command given to the studied subject (see Methods section) transfers the focus from the direct statement regarding their positive health or the survival abilities in conjunction with a specific index (a detailed variable) to the need of assessment of subjective sense of that indices. The key element of methodological correctness is the instruction given to the respondent, containing information that not always the sense of intensity of

a given index at very high level ("5") indicates very high level of health (or survival abilities) and not always the subjectively assessed value of "1" indicates very low level.

The obtained results in the group of female students showed that the methodically properly used SPHSA questionnaire is a sensitive diagnostic tool. The statistically significant differences in favour of physically active female students relate to indices of anaerobic capacity, muscle strength, aggressiveness, precision skills before and during the physical effort and swimming ability. This is justifiable since to perform the sports preferred by those female students one needs to possess optimal anaerobic capacity, muscle strength and precision skills. The respect to fair play rule is the prerequisite of effectiveness of sport competition, so the aggressiveness is not a desirable virtue. As it may be seen, young female students who systematically engage in physical activity understand that relation and perceive themselves as nonaggressive individuals. They are not under the influence of sportscasters and some athletes commenting the sports event, who state that aggressive attitude (or more ridiculously use terms such as: aggressive run, aggressive jump, aggressive giant slalom) are the crucial elements indispensable for a success in sports competition. The other issue is if the self-assessment of low level of own aggressiveness would be positively or negatively verified by empirical methods (the diagnosed profile).

Some of the studied issues seem to be of interest. Do the differences in the declared profiles of sense of positive health and survival abilities by individuals, who possess substantially different sports experience would be revealed in the process of empirical verification? Do the everyday physical activity, individual's age, education, occupation etc. constitute a substantial factor responsible for increasing the odds of similarity of the declared profile of positive health and survival abilities with the empirically diagnosed profile? Which of the recommended tests used for diagnosis of particular dimensions of health and survival abilities are the most reliable and which are so universal, that they could be used for testing individuals of different age (or almost in any age), regardless of sex and other factors?

The possibilities of the SPHSA questionnaire application are numerous and it may be used not only by personal trainers (leaders). This questionnaire is even appropriate for an individual use (including the elderly) who would like to seriously take care of his own health, starting with subjective analysis of the most important indices (recommended by the results of scientific research). The difficulty with empiric verification of the subjectively assessed indices is very likely. In such situation professional help would be advisable. Unfortunately

the available recommendations concern almost only assessment of somatic health. The set of eight indices of A dimension in SPHSA questionnaire is similar to that recommended by the Institute for Aerobic Research in Dallas (USA) and other institutions and authors [12–17]. In the case of the elderly the suitability of the recommended tests should be consulted and the selection of the proper test should be done.

Assuming, that the purposeful care of individual's health status in its all dimension as well as personal safety should be the results of effective health-related education, it may be stated that the non-apparatus and quasi-apparatus tests constitute the most appropriate tools for permanent monitoring of the health indices and survival abilities [18]. Such test should fulfil the criteria of reliability (desirably with the highest value of reliability and accuracy), but at the same time it should fulfil high standards of motor and effort safety [9]. It is worth noting, that non-apparatus and quasi-apparatus tests could be used in any circumstances, even by inmates of penitentiary institution. The care of individual's health should be a primary goal of modern corrective. The last statement shows a definitive need of complex assessment of health status – both its mental and social dimension. The main criteria of individual's health care is the engagement in everyday physical activity rather than the level of physical fitness or capacity [19,20]. Physical fitness or capacity may even significantly deteriorate with time (disregarding the involutional changes typical to the ontogenesis), as a result of expansion of some factors which lead to degradation of health. The rational engagement in physical activity may results in a substantial slowdown of this process.

CONCLUSIONS

The fulfilment of the rules mentioned in the last indention of the text implicates that the professional qualifications of the *health-related training* specialist should be based on interdisciplinary knowledge. The empiric argumentation presented in this paper definitely shows that diversification of assessment is higher in the case of indices, for which it may be assumed, that a given person, possessing the current status of health culture, is able to evaluate subjectively but relatively precisely. Among these indices are the ones of somatic health, mental health and some of the survival abilities in various difficult circumstances. Personal trainer (leader) of *health-related training* possessing interdisciplinary qualifications [9,20] is able to fulfil these criteria of both empiric diagnosis of positive health and survival abilities, as well as implementation of the *complementary health-related training* [9], suitably tailored to psychomotoric abilities of individuals of different sex, age, level of emotional maturity etc.

Acknowledgement

References:

1. Pszczołowski T: Mała encyklopedia prakseologii i teorii organizacji. Zakład Narodowy imienia Ossolińskich. Wrocław–Gdańsk, 1978 [in Polish]

2. Kozielecki J: Koncepcja transgresyjna człowieka. Analiza psychologiczna. Państwowe Wydawnictwo Naukowe. Warszawa, 1987 [in Polish, summary in English]

3. The Bologna Declaration; 19 June 1999: *http://www. ond.vlaanderen.be/hogeronderwijs/bologna/documents/ MDC/BOLOGNA_DECLARATION1.pdf*

4. Chakravarthy MV, Joyner MJ, Booth FW: An obligation for primary care physicians to prescribe physical activity sedentary patients to reduce the risk of chronic health conditions. Mayo Clin Proc, 2002; 77: 165–73

5. Klukowski K, Mazurek K: Rekreacja ruchowa a trening zdrowotny z punktu widzenia promocji zdrowia. [In:] Klukowski K, Łapiński P, Wiza A, Kaczmarek A (ed.) Promocja zdrowia we współczesnym więziennictwie. COSSW. PSNARiT. PTNKF. Kalisz, 2006; 57–75 [in Polish]

6. Kalina RM, Barczyński BJ, Klukowski K et al: The method to evaluate the susceptibility to injuries during the fall – validation procedure of the specific motor test. Arch Budo, 2011; 7(4): 201–15

7. Starc G: SLO FIT System. A tool for the monitoring of physical and motor development of children and youth [In:] 4th International Symposium Youth Sport 2008. The Heart of Eurpoe. Book of Abstracts. Ljubljana, 14–16 November 2008; 40–41

8. Kalina RM, Obodyński K, Podolski A: Progressive model of physical education. [in:] 4th International Symposium Youth Sport 2008. The Heart of Europe. Book of Abstracts. Ljubljana, 14–16 November 2008; 68–69

9. Kalina RM, Barczyński BJ: EKO-AGRO-FITNESS© original author continuous program of health-oriented and ecological education in the family, among friends or individually implemented – the premises and assumptions. Arch Budo, 2010; 6(4): 179–84

10. Markiewicz M: Deklarowany i zdiagnozowany poziom rozwoju biologicznego studentów kierunku kształcenia turystyka i rekreacja. Bachelor Thesis. Nowy Targ, 2009 [in Polish]

11. Romanowski J: Deklarowany i zdiagnozowany poziom rozwoju biologicznego studentek kierunku kształcenia turystyka i rekreacja. Bachelor Thesis. Nowy Targ, 2009 [in Polish]

12. Cooper KH: The aerobics program for total wellbeing. Bantham Books. Toronto, 1982

13. Paffenbarger RS Jr, Olsen E: Lifefit. An effective exercise program for optimal health and longer life. Human Kinetics. Champaign, IL, 1996

14. Kuński H: Trening zdrowotny osób dorosłych. Poradnik lekarza i trenera. Agencja Wydawnicza Medsportpress. Warszawa, 2002 [in Polish]

15. American College of Sport Medicine (ACMS). ACM's guidelines for exercise testing and prescription. 7th ed. Lippinncott Wiliams & Wilkinsc. Philadelphia, 2006

16. Heyward VH: Advanced fitness assessment and exercise prescription. 5th ed. Human Kinetics, 2006

17. Krawczyński M: Sprawność i wydolność fizyczna jako pozytywne mierniki zdrowia dzieci i młodzieży [In:] Klukowski KS (ed.) Medycyna aktywności fizycznej z elementami psychologii i pedagogiki. Tom I Medycyna aktywności fizycznej. Wysiłek fizyczny w aspekcie wieku. Pedagogika zdrowia. Wydawnictwa Dydaktyczne. AWF. Warszawa, 2010; 26–36 [in Polish]

18. Kalina RM: Applying non-apparatus and quasi-apparatus tests in a widely understood concept of health promotion – an example of flexibility measurement and assessment. Arch Budo, 2012; 8(3): 125–32

19. Shephard RJ, Bouchard C: Associated Between Health Behaviour and Health Related Fitness. Br J Sports Med, 1996; 30: 94–101

20. Kulmatycki L: Promocja zdrowia w kulturze fizycznej. Kryteria dobrej praktyki. Studia i monografie 68. Wydawnictwo AWF Wrocław, 2003 [in Polish]

21. Martin EM (ed.): Concise Colour Medical Dictionary. Oxford University Press, 1996