The diversity of the profiles involving the sense of positive health and survival abilities of Polish students of paramedical sciences

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Abstract

Background and Study Aim: The knowledge of subjective sense of various dimensions of own health confronted with the results of particular health indices is a preliminary condition to develop appropriate long-term strategy of health-related training for a given person, specified professional groups, social groups relatively uniform in terms of one feature or features, etc. The aim of the study is knowledge about the diversity of the profiles involving sense of positive health and survival abilities of Polish students of paramedical sciences. The specific objective of the study is to answer the questions whether the subjective sense of positive health and survival abilities is significantly dependent on the field of education, declared physical activity, sex, correctness (or incorrectness) of BMI.

Material and methods: The study involved 183 students (114 females and 69 males) aged 18-30 years old ($\bar{x}$22.3±1.91) of paramedic sciences and of the last semesters of the following first degree studies: medical rescue (49.2%), nursing (28.4%), public health (22.4 %). The Sense of Positive Health an Survival Abilities questionnaire (SPHSA) was applied in the study. The profile based on the subjective sense of various positive health indices covers four dimensions: somatic (A), mental (B), social (C) and survival abilities (D). The sense of intensity of particular indices is evaluated in 1 to 5 scale (its value is as follows: 1 – very low, 2 – low, 3 – average, 4 – high, 5 – very high). The "0" index is used for 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 (SPHSA index).

Results: General SPHSA index of all tested students amounts to 3.72±0.43 points and is comparable to declarations of other previously tested students studying other subjects. The sense of social health is the highest($\bar{x}$4.20±0.43), whereas the sense of mental health is the lowest ($\bar{x}$3.36±0.75). Significant differentiation ($p<0.001$) among different fields of study involves the sense of mental health of students from nursing ($\bar{x}$3.92±0.87) and students of medical rescue ($\bar{x}$2.97±0.69). No significant relationship between increased physics activity (daily) and higher sense of positive health and survival abilities was determined.

Conclusions: Large similarity of profiles and general SPHSA index of students of various paramedic sciences (with reference to comparison of both indices with previously tested students in other regions of Poland) constitutes an empirical proof that in-depth knowledge of body functioning is not a factor which modifies self-assessment about their own health and survival ability in difficult situations. It was a comparison of SPHSA profiles based on subjective evaluations with empirically diagnosed indices in the same people that can help resolve the issue of relevance of such self-assessment. Lack of significant differences may imply no merits in creating short-term individual programmes involving preliminary health-related training in order to enhance factors that increase the risk of body disintegration including death in difficult situations.

Key words: health promotion · health-related training · SPHSA questionnaire

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Introduction

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 [22]

Quasi-apparatus test – can be conducted with simple instruments (a stopwatch, a ruler, a measuring tape, etc.) [22]

Numerous proposals for health promotion, including the general ideas as well as the specifics of their possible implementations in various countries constitute an empirical justification for the validity of the authors' intentions of the *Health Promotion Glossary* [1]. They refer to the inspirations and findings of the WHO starting from 1948 and ending with the *Fourth International Conference on Health Promotion, New Players for a New Era: Leading Health Promotion into the 21st Century,* which was held in Jakarta, Indonesia, in July 1997.

One of the most well-known interpretation of these findings is the paper of Eriksson & Lindström [2], in which the authors clearly stress the need to increase the control over physical, mental, social and spiritual health and to undertake activities aimed at improving health (understood as all mentioned dimensions of health) by units, groups and societies. In the period between publishing *Health Promotion Glossary* [1] and the paper of Eriksson & Lindström [2], numerous authors from various countries provided theoretical and empirical justification for health promotion and measurement either in more general sense [3, 4] or through emphasising the particular dimension of health or its element (e.g. physical) and on the whole of selected social groups [5-11].

This trend has been maintained after 2008 [12-16]. What is new is the Sense of Positive Health an Survival Abilities questionnaire (SPHSA) developed by Kalina [17]. This is the first attempt to evaluate all dimensions of health and survival abilities depicted with eight detailed indices. Each variable of the SPHSA is measured on the ordinal scale from 1 to 5, and in the case of survival abilities (when it comes to specific skills, e.g. swimming) the scale ranges from 0 to 5.

The aim of the study is knowledge about the diversity of the profiles involving sense of positive health and survival abilities of Polish students of paramedical sciences. The specific objective of the study is to answer the questions whether the subjective sense of positive health and survival abilities is significantly dependent on the field of education, declared physical activity, sex, correctness (or incorrectness) of BMI.

Material and methods

The study involved 183 students (114 females and 69 males) aged 18-30 years old ($\bar{x}$22.3±1.1) of paramedic sciences and of the last semesters of the following first degree studies: medical rescue (49.2%), nursing (28.4%), public health (22.4%). All participants study in the Pope John Paul II State School of Higher Education in Biała Podlaska (eastern region of Poland).

Average body height of female students amounts to 166.8 cm (±5.06), whereas of male students to 181.2 cm (±4.97); average body mass of females students amounts to 61.7 kg (±10.42), whereas of male students 82.1 kg (±12.03); average BMI of female students amounts to 22.15 (±3.39), whereas of male students to 25.02 (±3.40). Men preferred the following sports and forms of physical activity (more than one discipline was taken into account): running (51.5%), strength training (36.4%), football (24.8%) and swimming (21.2%). The preferences of female students were as follows: running (64.5%), fitness (26%) and walking (22.6%).

The Sense of Positive Health an Survival Abilities questionnaire (SPHSA) was applied in the study [17]. The profile based on the subjective sense of various positive health indices covers four dimensions: somatic (A), mental (B), social (C) and survival abilities (D). The sense of intensity of particular indices is evaluated in 1 to 5 scale (its value is as follows: 1 – very low, 2 – low, 3 – average, 4 – high, 5 – very high). The "0" index is used for 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 (SPHSA index).

Statistical analysis

Arithmetic means of individual indices, standard deviations, distribution boundaries of the results (minimal and maximal values) as well as variation coefficient in percent ($V_{\%}$) were calculated. In the paper the following tests were applied: non-parametric Friedman test and Kruskal-Wallis test and Mann-Whitney U test. Friedman test was used to compare dependent samples (variables from A to D) for the total sample of students and within homogeneous groups (students of various faculties, of the same sex, the type of physical activity declared, correct/incorrect BMI). Kruskal-Wallis test compared three independent samples (i.e. groups of students from three faculties) taking into consideration variables A to D as well as detailed index of each health dimension (A, B, C) and survival abilities (D). Mann-Whitney U test was applied to examine the indices for two independent samples (daily physical activity – occasional physical activity; women – men, etc.). Statistically significant difference was assumed for $p<0.05$.

Results

The students (women and men altogether) rated the highest their social health to 4.20 (±0.75), whereas the lowest their mental health to 3.36 (±0.87). They assessed their somatic health to 3.61 (±0.54), survival abilities to 3.82 (±0.65) and SPHSA index to 3.72 (±0.43). Significant differentiation within the fields of education involve only mental health with the highest declared value of this index by nursing students 3.92 (±0.9) and the lowest of medical rescue students 2.97 (±0.7) – Table 1.

The index of systolic heart pressure of 3.89 (±0.95) and of diastolic pressure of 3.82 (±0.92) dominate among specific indices of somatic health. The lowest index assessed by students is the flexibility of 3.21 (±1.14). Statistically significant differences between the fields of study were determined in relation to BMI – the highest value of 4.08 (±0.8) is declared by the students of nursing. Students of medical rescue rated the highest both their aerobic capacity (3.76±0.96) and anaerobic capacity (3.54±0.94). Significantly higher values were determined among students of medical rescue, while the lowest among students of nursing (Table 2).

Declarations of students dominated the dimension of mental health with high assessment of stress coping skills amounting to 4.43 (±0.77). Tolerance was assessed the lowest, i.e. 3.86 with greater diversity of assessments (±1.20). The results of all examined students indicate that the elements of mental health, estimated below the average level, include aggressiveness (2.57±1.63) and the sense of fear (2.60±1.59). Among four specific indices of mental health the lack of statistically significant differences between declarations

Table 1. General profiles of the sense positive health and survival abilities of students of paramedical sciences

Field of education		Somatic health (A)	Mental health (B)	Social health (C)	Survival abilities (D)	SPHSA index	Friedman test
All students (n=183)	x̄	3.61	3.36	4.20	3.82	3.72	**F=168.58 p<0.0001***
	SD	0.54	0.87	0.75	0.65	0.43	
	x_{min}	1.75	1.25	0.67	1.88	1.91	
	x_{max}	4.75	5.00	5.00	5.00	4.48	
	$V_{\%}$	14.84	25.89	17.96	16.92	11.52	
Medical Rescue (MR) (n=90)	x̄	3.65	**2.97**$^{PH.Nu}$	4.14	3.78	3.64	**F=132.50 p<0.0001***
	SD	0.61	0.69	0.83	0.65	0.45	
	x_{min}	1.75	1.25	0.67	1.88	1.91	
	x_{max}	4.75	5.00	5.00	4.88	4.48	
	$V_{\%}$	16.72	23.33	19.95	17.27	12.23	
Nursing (Nu) (n=52)	x̄	3.50	**3.92**^{MR}	4.18	3.86	3.79	**F=44.41 p<0.0001***
	SD	0.33	0.87	0.71	0.65	0.38	
	x_{min}	2.88	1.75	2.67	2.13	2.96	
	x_{max}	4.13	5.00	5.00	4.63	4.30	
	$V_{\%}$	9.34	22.06	16.90	16.92	9.93	
Public Health (PH) (n=41)	x̄	3.64	**3.52**^{MR}	4.38	3.83	3.78	**F=47.15 p<0.0001***
	SD	0.56	0.80	0.63	0.63	0.43	
	x_{min}	2.63	1.75	1.67	2.25	2.57	
	x_{max}	4.50	4.75	5.00	5.00	4.48	
	$V_{\%}$	15.50	22.81	14.39	16.46	11.45	
Kruskal-Wallis test	H	4.03	**40.13**	2.62	0.70	4.97	
	p	0.1336	**0.0001***	0.2702	0.7037	0.0833	

H – Kruskal-Wallis test value; *significant differences at p<0.05

Table 2. Detaile indicators somatic health (A) of students of paramedical sciences

Field of education		1	2	3	4	5	6	7	8	Friedman test
All students (n=183)	x̄	3.69	3.78	3.89	3.82	3.52	3.29	3.66	3.21	**F=98.77 p<0.0001***
	SD	0.99	0.97	0.95	0.92	0.91	0.88	0.97	1.14	
Medical Rescue (MR) (n=90)	x̄	**3.46^{Nu}**	3.68	3.83	3.78	**3.76^{Nu}**	**3.54^{Nu}**	3.81	3.37	**F=23.60 p=0.0013***
	SD	1.12	1.04	1.05	1.09	0.96	0.94	0.91	1.06	
Nursing (Nu) (n=52)	x̄	**4.08^{MR}**	3.96	3.85	3.85	**3.08$^{MR.PH}$**	**2.85$^{MR.PH}$**	3.42	2.96	**F=101.92 p<0.0001***
	SD	0.79	0.77	0.83	0.67	0.62	0.61	0.94	1.17	
Public Health (PH) (n=41)	x̄	3.73	3.76	4.05	3.88	**3.59^{Nu}**	**3.29^{Nu}**	3.63	3.17	**F=28.71 p=0.0002***
	SD	0.74	1.04	0.84	0.81	0.92	0.84	1.09	1.22	
Kruskal-Wallis test	H	**12.05**	2.49	1.36	0.12	**21.14**	**22.71**	4.31	3.76	
	p	**0.0024***	0.2884	0.5075	0.9411	**0.0001***	**0.0001***	0.1158	0.1528	

1-BMI, 2-resting HR, 3-systolic blood pressure, 4-diastolic blood pressure, 5-aerobic capacity, 6-anaerobic capacity, 7-muslce strength, 8-flexibility; H – Kruskal-Wallis test value; * significant differences at p<0.05

of students of various sciences does not concern tolerance. The students of nursing are the least aggressive (3.54±1.54), whereas the students of medical rescue are the most aggressive (1.96±1.41). The same relation applies to the sense of fear- nursing (3.73±1.36), medical rescue (1.87±1.37) – Table 3.

The hierarchy of the social health among all students was dominated by the declarations demonstrating responsibility amounting to 4.49 (±0.80). The assessment of respecting supreme values 4.08 (±0.93) and respecting „fair play" rule 4.05 (±1.11) is similar. The index of respecting supreme values statistically significantly differentiates students of various sciences. It is the highest among students public health (4.39±0.74). Furthermore, those students were not statistically different as for the three specific indices of social health (Table 4).

The first aid skills were assessed the highest by students (4.54±0.69) and this is the only index calculated for all students, which indicates very high level of the feature (within the meaning of an average result). Body balance disturbation tolerance skills were rated the lowest (3.42±1.04). At the same time, students of nursing and public health assessed this ability as the highest (4.73±0.53 vs. 4.68±0.72). Paradoxically, students of medical rescue assessed their first aid skills to be the lowest (4.37±0.73), even though this is the average result exceeding the high assessment. Students of various sciences are statistically significantly differentiated by the declarations related to the assessment of precision skills before and during activity. Students of nursing believed these skills to be the lowest (3.46±0.90) – Table 5.

The results of Friedman test indicate that among general index of the SPHSA questionnaire of students analysed in groups of „every day physical activity" and „occasional physical activity" show statistically significant differences. On the other hand, the results of Mann-Whitney U test indicate that statistically significant differences among students related to daily physical activity and occasional physical activity involve only the somatic health of students of medical rescue (the highest score as for daily physical activity) and the social health of students of nursing (the highest score of occasional physical activity) – Table 6.

The sex of examined students (excluding students of nursing with only two male students) turned out to be more differentiating factor than physical activity. The results of Friedman test indicate lack of statistically significant differences between general indices of SPHSA questionnaire only among male students of public health. The result of Mann-Whitney U test reveal that the only statistically significant difference between all female students and male students is related to mental health. It is significantly higher in females (3.34±0.77) than in males (2.95±0.73). Female students of public health declared higher level of somatic health and SPHSA index than male students (Table 7).

The results of Friedman test indicate that general indices of the SPHSA questionnaire of students analysed in groups of correct or incorrect BMI show statistically significant differences. The results of Mann-Whitney U test demonstrate, however, that statistically significant differences between students compared according to this criterion relate only to mental health within each field of study and not within all students. In contrast to those being overweight, students of medical rescue and public health with correct BMI assessed higher the level

Table 3. Detaile indicators mental health (B) of students of paramedical sciences

Field of education		Aggressiveness	Sense of fear	Stress coping skills	Tolerance	Friedman test
All students (n=183)	x̄	2.57	2.60	4.43	3.86	**F=200.08 p<0.0001***
	SD	1.63	1.59	0.77	1.20	
Medical Rescue (MR) (n=90)	x̄	**1.96^{Nu}**	**1.87$^{PH.Nu}$**	4.29	3.77	**F=151.39 p<0.0001***
	SD	1.41	1.37	0.84	1.32	
Nursing (Nu) (n=52)	x̄	**3.54^{MR}**	**3.73$^{MR.PH}$**	4.50	3.92	**F=18.54 p=0.0003***
	SD	1.57	1.36	0.70	0.93	
Public Health (PH) (n=41)	x̄	2.71	**2.76$^{MR.Nu}$**	4.66	3.98	**F=61.25 p<0.0001***
	SD	1.55	1.45	0.62	1.25	
Kruskal-Wallis test	H	**30.11**	**45.58**	**7.31**	1.11	
	p	**0.0001***	**0.0001***	**0.0259***	0.5732	

H – Kruskal-Wallis test value; *significant differences at p<0.05

Table 4. Detaile indicators social health (C) of students of paramedical sciences

Field of education		Respecting „fair play" rule	Respecting supreme values	Responsibility	Friedman test
All students (n=183)	x̄	4.05	4.08	4.49	**F=41.53 p<0.0001***
	SD	1.11	0.93	0.80	
Medical Rescue (MR) (n=90)	x̄	4.00	3.98	4.43	**F=23.53 p<0.0001***
	SD	1.14	1.02	0.94	
Nursing (Nu) (n=52)	x̄	3.96	4.00	4.58	**F=19.86 p<0.0001***
	SD	1.20	0.89	0.64	
Public Health (PH) (n=41)	x̄	4.27	4.39	4.49	F=3.82 p=0.1479
	SD	0.90	0.74	0.68	
Kruskal-Wallis test	H	1.33	**6.08**	0.55	
	p	0.5138	**0.0478***	0.7584	

H – Kruskal-Wallis test value; *significant differences at p<0.05

Table 5. Detaile indicators survival abilities (D) of students of paramedical sciences

Field of education		1	2	3	4	5	6	7	8	Friedman test
All students (n=183)	x̄	3.42	3.68	3.66	3.96	3.63	3.63	4.54	3.99	**F=178.73 p<0.0001***
	SD	1.04	0.98	1.03	1.04	1.21	1.25	0.69	1.01	
Medical Rescue (MR) (n=90)	x̄	3.40	3.83	3.69	3.87	3.66	3.57	**4.37$^{PH.Nu}$**	3.90	**F=58.39 p<0.0001***
	SD	1.12	0.94	1.06	1.08	1.27	1.28	0.73	1.15	
Nursing (Nu) (n=52)	x̄	3.46	3.42	3.81	3.92	3.69	3.73	**4.73^{MR}**	4.12	**F=77.06 p<0.0001***
	SD	0.90	0.94	0.89	1.08	1.18	1.27	0.53	0.90	
Public Health (PH) (n=41)	x̄	3.41	3.66	3.41	4.22	3.51	3.66	**4.68^{MR}**	4.05	**F=70.53 p<0.0001***
	SD	1.05	1.06	1.12	0.88	1.10	1.20	0.72	0.80	
Kruskal-Wallis test	H	0.17	**6.21**	2.98	2.89	1.05	0.73	**15.53**	0.75	
	p	0.9206	**0.0449***	0.2257	0.2360	0.5928	0.6950	**0.0004***	0.6885	

1-body balance disturbation tolerance skills, 2-precision skills before and during activity, 3-safe falling skills, 4-self-defence skills, 5-swimming ability, 6-lifesaving skills in water, 7-first aid skills, 8-survival abilities in solitude; H – Kruskal-Wallis test value; * significant differences at p<0.05

Table 6. General profiles of the sense positive health and survival abilities of students of paramedical sciences differing physical activity

Field of education			Somatic health (A)	Mental health (B)	Social health (C)	Survival abilities (D)	SPHSA index	Friedman test
All students (n=183)	**O** 119	x̄	3.55	3.38	4.20	3.84	3.70	**F=120.65 p<0.0001***
		SD	0.51	0.84	0.78	0.58	0.42	
	E 64	x̄	3.72	3.33	4.22	3.78	3.74	**F=94.66 p<0.0001***
		SD	0.56	0.93	0.71	0.75	0.44	
Mann-Whitney test		Z	1.86	–0.67	0.02	0.06	0.55	
		p	0.0634	0.5008	0.9870	0.9544	0.5820	
Medical Rescue (MR) (n=90)	**O** 51	x̄	**3.52**	2.96	4.02	3.78	3.58	**F=73.16 p<0.0001***
		SD	0.56	0.71	0.89	0.63	0.45	
	E 39	x̄	**3.82**	2.99	4.29	3.79	3.73	**F=64.05 p<0.0001***
		SD	0.64	0.68	0.71	0.70	0.43	
Mann-Whitney test		Z	**2.38**	–0.04	1.53	0.28	1.65	
		p	**0.0173***	0.9673	0.1248	0.7783	0.0989	
Nursing (Nu) (n=52)	**O** 38	x̄	3.52	3.86	**4.32**	3.92	3.82	**F=45.02 p<0.0001***
		SD	0.35	0.75	0.65	0.53	0.34	
	E 14	x̄	3.46	4.11	**3.81**	3.70	3.70	**F=10.55 p=0.0321***
		SD	0.27	1.13	0.74	0.92	0.47	
Mann-Whitney test		Z	0.63	–1.54	**2.39**	0.33	0.83	
		p	0.5317	0.1238	**0.0168***	0.7402	0.4079	
Public Health (PH) (n=41)	**O** 30	x̄	3.62	3.52	4.34	3.82	3.77	**F=30.28 p<0.0001***
		SD	0.59	0.81	0.68	0.58	0.43	
	E 11	x̄	3.68	3.55	4.48	3.84	3.82	**F=17.68 p=0.0014***
		SD	0.49	0.83	0.48	0.77	0.47	
Mann-Whitney test		Z	0.10	–0.09	0.41	0.16	0.37	
		p	0.9177	0.9291	0.6843	0.8710	0.7125	

E-every day physical activity; O-occasionally physical activity; Z-normal deviation; * significant differences at p<0.05

Table 7. General profiles of the sense positive health and survival abilities of medical rescue and public health students differing in the sex (not included in the analysis of nursing, because there were only 2 men)

Field of education			Somatic health (A)	Mental health (B)	Social health (C)	Survival abilities (D)	SPHSA index	Friedman test
All students (n=131)	M 67	x̄	3.62	**2.95**	4.11	3.79	3.63	**F=96.61 p<0.0001***
		SD	0.67	0.73	0.88	0.66	0.49	
	F 64	x̄	3.67	**3.34**	4.32	3.80	3.75	**F=72.81 p<0.0001***
		SD	0.51	0.77	0.63	0.63	0.39	
Mann-Whitney test		Z	–0.18	**–2.62**	–1.08	0.04	–1.26	
		p	0.8554	**0.0087***	0.2799	0.9669	0.2093	
Medical Rescue (MR) (n=90)	M 59	x̄	3.67	2.91	4.14	3.82	3.65	**F=94.66 p<0.0001***
		SD	0.67	0.70	0.87	0.69	0.49	
	F 31	x̄	3.62	3.09	4.13	3.71	3.63	**F=38.93 p<0.0001***
		SD	0.49	0.68	0.75	0.58	0.35	
Mann-Whitney test		Z	0,82	–1.08	0.40	1.02	0.64	
		p	0.4112	0.2809	0.6898	0.3091	0.5211	
Public Health (PH) (n=41)	M 8	x̄	**3.27**	3.28	3.88	3.56	**3.45**	F=7.00 p=0.1359
		SD	0.59	0.92	1.04	0.38	0.48	
	F 33	x̄	**3.73**	3.58	4.51	3.89	**3.86**	**F=41.06 p<0.0001***
		SD	0.53	0.78	0.43	0.67	0.39	
Mann-Whitney test		Z	**–2,20**	–0.73	–1.87	–1.62	**–2.26**	
		p	**0.0281***	0.4556	0.0616	0.1058	**0.0240***	

M-male; F-female; Z-normal deviation; * significant differences at p<0.05

Table 8. General profiles of the sense positive health and survival abilities of medical rescue and public health students differing in the BMI quality

Field of education			Somatic health (A)	Mental health (B)	Social health (C)	Survival abilities (D)	SPHSA index	Friedman test
All students (n=173#)	**CO** 123	x̄	3.61	3.47	4.23	3.88	3.76	**F=108.61 p<0.0001***
		SD	0.49	0.86	0.69	0.67	0.41	
	OV 50	x̄	3.65	3.11	4.15	3.76	3.66	**F=66.57 p<0.0001***
		SD	0.65	0.88	0.90	0.58	0.47	
Mann-Whitney test		Z	–0,55	–0.91	0.56	–0.60	–1.26	
		p	0.5803	0.3636	0.5786	0.5485	0.2072	
Medical Rescue (MR) (n=88)	**CO** 59	x̄	3.64	**3.09**	4.13	3.85	3.68	**F=76.19 p<0.0001***
		SD	0.55	0.65	0.80	0.67	0.43	
	OV 29	x̄	3.71	**2.74**	4.11	3.69	3.58	**F=54.90 p<0.0001***
		SD	0.74	0.74	0.91	0.64	0.48	
Mann-Whitney test		Z	–0.85	**2.37**	0.06	1.40	1.10	
		p	0.3973	**0.0178***	0.9498	0.1601	0.2732	
Nursing (Nu) (n=48)	**CO** 38	x̄	3.51	**3.86**	4.19	3.90	3.80	**F=36.42 p<0.0001***
		SD	0.30	0.93	0.61	0.65	0.35	
	OV 10	x̄	3.58	**4.25**	4.20	4.05	3.94	**F=11.02 p=0.0263***
		SD	0.39	0.55	0.91	0.51	0.40	
Mann-Whitney test		Z	0.68	**2.16**	0.80	1.08	1.78	
		p	0.4942	**0.0305***	0.4229	0.2785	0.0749	
Public Health (PH) (n=37)	**CO** 26	x̄	3.69	**3.77**	4.51	3.91	3.89	**F=33.55 p<0.0001***
		SD	0.55	0.83	0.45	0.71	0.41	
	OV 11	x̄	3.57	**3.05**	4.18	3.70	3.60	**F=22.02 P<0.0001***
		SD	0.62	0.56	0.96	0.40	0.45	
Mann-Whitney test		Z	-0.99	**2.29**	–0.04	1.38	0.48	
		p	0.3209	**0.0223***	0.9713	0.1664	0.6282	

CO-correct BMI; OV-overweight; Z-normal deviation; * significant differences at p<0.05;
in analysis 10 persons with the underweight were not taken into account: 2 medical rescue; 4 public health; 4 nursing

of their mental health. Female students of nursing, who declared overweight, assessed higher their mental health as opposed to those, who declared proper body build (Table 8).

Discussion

Friedman test result show that statistically significant differences mostly occur regardless of the comparison criterion of dependent samples (variables A to D) analysed according the field of education, declared physical activity, sex, correct (or incorrect) BMI. The result of the analysis reinforces the justification for the accuracy of this research tool [17]. In current applications of SPHSA questionnaire [17-19] the analyses have not been so accurate. Therefore, this constitutes another empirical evidence that SPHSA questionnaire fulfils theoretical criterion for differentiating between measurements in accordance with individual perception of feature intensity (given detailed index). The Kruskal-Wallis test results, which compared three independent samples (i.e. groups of students from three faculties) taking into consideration detailed index of each health dimension (A, B, C) and survival abilities (D) as well as the Mann-Whitney U test result applied to examine particular indices for two independent samples (determined pairs of compared sets of results) constitute an empirical proof that some hidden factors determine differentiation of the declarations related to the perception degree of the intensity of given features, i.e. detailed indices of positive health (A, B, C) and survival abiities (D).

Current applications of SPHSA questionnaire have revealed two regularities. The first one states that the respondents, i.e. female students of physiotherapy [17], tourism and recreation [18] and physical education [19] consider their survival abilities to be the lowest. The second one reveals that respondents declaring daily physical activity assess higher their

own sense of positive health and survival abilities expressed with general indices of SPHSA.

This study does not confirm this regularity but reveal some similarities. Students of paramedical sciences (treated as a whole group) assessed the level of their mental and somatic health as the lowest. The factor of declared physical activity (also compared against the total number of examined students) does not differentiate on statistically significant level the general indices of SPHSA. However, respondents declaring daily physical activity assess higher their level of somatic health, which is consistent with the declarations of physically active females examined by Kalina [17] and Jagiełło et al. [18,19]. These observations confirm the correctness of the conclusions from quoted studies [17-19] that people exercising regularly probably more accurately assess their motor skills. This hypothesis requires however empirical validation.

Obvious similarity involves the highest assessments of the perception of own social health by students, who declare daily physical activity regardless of the field of study. Female students of physical education constitute an exception, because they assessed their somatic health as the highest [19]. It is difficult to comment on the similarity of the SPHSA index referred to examined population of students on this level of validity. The authors of previous studies have based comparative studies on people who differed in physical activity. In this study the similarity of the groups is very high: daily physical activity 3.74 (±0.44) vs. occasional physical activity 3.70 (±0.42). In fact, the similarity of the study results and previous ones related to students, who declare daily physical activity is greater: tourism and recreation 3.740 [18], physiotherapy 3.641 [17], physical education 4.080 [19]. The similarity of those, who declare occasional physical activity is slightly lower: 3.427 vs. 3.479 vs. 3.757, respectively.

In the first paragraph of this discussion I have highlighted that the SPHSA questionnaire fulfils theoretical criterion for differentiating between measurements in accordance with individual perception of feature intensity. More detailed analysis of the results of my study reveals probable cause of differentiation of those perceptions. I have above mentioned the impact of frequent motor experiences on the somatic health. The specificity of the studies may have influenced the survival abilities to be perceived as higher by the students of paramedical sciences (3.82) with relatively slight differentiation of assessments (±0.65). The results of index D was significantly influenced by the declarations related to first aid skills (from 4.37 of medical rescue students to 4.73 of nursing students). Nominally higher index D (3.895) was determined only in declaration of physical education female students [19], one fifth of which declared that they prefer swimming and, moreover, the specificity of studies is based on learning movement forms determining survival abilities (combat sports elements, lifesaving skills in water) and stimulating body balance disturbation tolerance skills, precision skills before and during activity, etc.

Similarly, another two interpretations of the results may be based on the specificity of the studies. Declarations of nursing students (enhanced moreover by experience resulting from traineeships in hospitals) can be differentiated in respect to the sense of mental health (3.92). All students of paramedical sciences are distinguished by the declarations related to the sense of responsibility (ranging from 4.43 to 4.58). It is thus not surprising that the high sense of responsibility is a basic condition to fulfil the mission of medical service worker.

All current study results confirm that SPHSA questionnaire [17] in some sense integrates the ideas of the need to measure health [1, 2] and daily (occasional) physical activity [4, 5, 14]. One A4 sheet is enough to document basic information (declared and measured). Unfortunately, current empirical data are related only to declared indices. This is a serious challenge of methodological nature. Measurement methods of somatic health and survival abilities [20] are adjusted to the criteria of SPHSA questionnaire. Original methodological achievement of this proposal is to use mostly non-apparatus and quasi-apparatus tests for documented validated procedure [21-23]. Therefore, each user of the SPHSA questionnaire can even make his/her own assessment of the majority of detailed indices of the dimensions A and D.

The issue is also significant from other perspectives. For many years, scientists and experts teams propose health educational programmes and various measurement systems of mainly biological (motor) effects of exercises [24-28]. The diversity of the offers to measure the effects of health-related training has many advantages but it also creates more difficulties in systemic health monitoring.

In recent years interesting programmes of health-related training based on safe falling exercises have been developed [21, 29]. The authors of those programmes successfully apply specific non-apparatus and quasi-apparatus tests to measure effects of such trainings, which are

a relevant part of developing survival abilities. On the other hand, the "Rotational Test" [23], easy-to-use in all conditions, either in non-apparatus or quasi-apparatus version is useful e.g. for selection of the fire-fighters to solve difficult tasks of the rescue [30]. Tests referred to above [21, 22, 29] are included in the set of tools measuring dimension D [20]. It is to be expected that soon there will emerge publications informing about the compliance or discrepancies declared by the examined people of at least sense of somatic health (dimension A) and survival abilities (dimension D) in the framework of using the SPHSA questionnaire.

Conclusion

Large similarity of profiles and general SPHSA index of students of various paramedic sciences (with reference to comparison of both indices with previously tested students in other regions of Poland) constitutes an empirical proof that in-depth knowledge of body functioning is not a factor which modifies self-assessment about their own health and survival ability in difficult situations. It was a comparison of SPHSA profiles based on subjective evaluations with empirically diagnosed indices in the same people that can help resolve the issue of relevance of such self-assessment. Lack of significant differences may imply no merits in creating short-term individual programmes involving preliminary health-related training in order to enhance factors that increase the risk of body disintegration including death in difficult situations.

Competing interests

The author declares that has no competing interests.

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