

# The subjective profile of positive health and survival abilities in women differing as to physical activity

## Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Manuscript Preparation
- E** Funds Collection

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**Source of support:** Departmental sources

**Received:** 7 October 2012; **Accepted:** 7 November 2012; **Published online:** 11 November 2012

## Abstract

### Background and Study Aim:

The main aim of the study is to define the profile of positive health and survival abilities in women differing as to physical activity. Thus formulated study aim was connected with answering the following question: do young women, undergraduate students at the Faculty of Tourism and Recreation, who declare daily physical activity substantially differ from their peers declaring occasional activity in the sense of positive health in all its aspects and in self-assessment of their survival abilities?

### Material/Methods:

The profile of women's positive health and survival abilities was defined on the basis of Kalina's original methodology (2012) taking into account four aspects of indices: the somatic (A), mental (B), social (C) and reflecting survival abilities (D) ones. The arithmetic mean calculated for indices A to D represents the most general index of the Sense of Positive Health and Survival Abilities (SPHSA). The studied group was composed of female students from the Faculty of Tourism and Recreation completing their education at the undergraduate level (6<sup>th</sup> semester). 24 students declared daily physical activity, and 34 students the occasional one. The subjects' age was within the range of 20–23 years (21.24±0.99).

### Results:

Women declaring daily physical activity surpass their occasionally active peers in the SPHSA index – 3.740 and 3.427, respectively (p<0.01). The highest value of indices in both groups was noted in social health (4.08 and 3.95), while the lowest one in the survival ability (3.5 and 3.165). Students who are active every day have statistically higher values than their occasionally active peers in the following indices: aerobic capacity (p<0.01), flexibility (p<0.001), muscular power (p<0.001), lesser aggressiveness (p<0.05), anxiety (p<0.001), skill of safe falling (p<0.05), and the ability to act precisely before and after physical activity (p<0.05).

### Conclusions:

Physical activity constitutes an important factor modifying the sense of positive health and the survival ability. The structure of the SPHSA profile was similar in both groups. The differences regarded the intensity of those aspects which undergo the greatest changes under the influence of physical activity: somatic and mental health.

### Key words:

female students • health promotion • non-apparatus method • sportsmanlike

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## BACKGROUND

The World Health Organization defined health as “the state of full physical, mental and social well-being, rather than only a lack of an illness or ailment (impairment)”. In the last years this definition has been completed with the efficiency of “leading a productive social and economic life” as well as with the spiritual aspect [1–4].

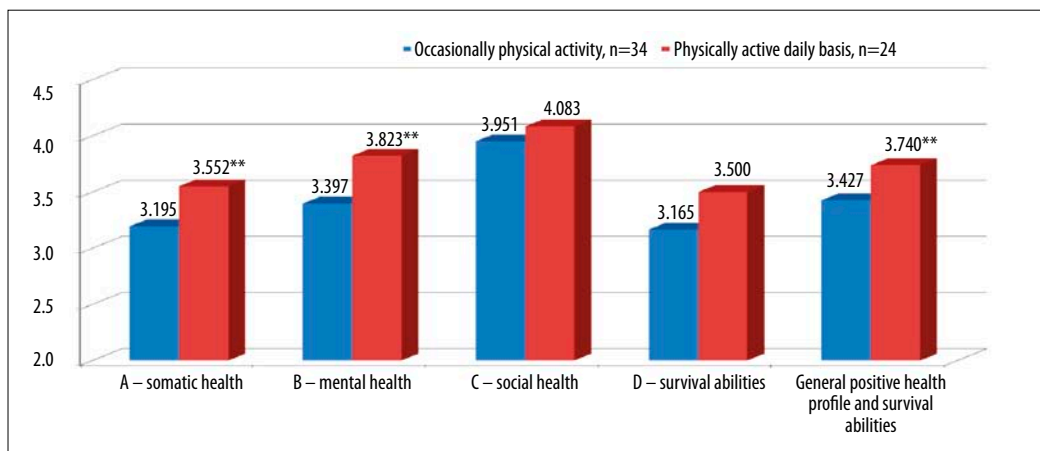
From the genetic point of view, it is possible to treat the notion of health as an optimal balance between an organism and the environment. However, it is not a state, but a constant process; it is an unstable balance – the health status is subject to constant changes [5].

Nevertheless, regardless of the differences in the approach to the definition, it is one of the most substantial

**Health promotion** – a programme of surveillance planned on a community basis to maintain the best possible health and quality of life of the members of that community, both collectively and individually. Programmes include a blend of such personal services as health education, immunization, and screening tests, with environmental monitoring of atmosphere, housing, and water and food supplies, as well as occupational hazards [2].

**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 [3].

**Sportsmanlike** – adjective used for describing conduct considered fitting for a sportsman, including observance of the rules of fair play, respect for others and graciousness in losing [11].



**Figure 1.** General profiles of positive health and survival ability of female students of the faculty of tourism and recreation differing in terms of physical activity, \*\*  $p < 0.01$ .

problems of mankind. Contrary to appearances, the influence of medical services (repair) on health is relatively little. According to literature data this constitutes about 15–20%. The influence of the genetic factor is determined at 15–20%, similarly to the social background. The influence of lifestyle is regarded as the most significant – amounting to as much as 50% [6].

The problem of physical activity of people of different ages and the question of the need for permanent monitoring of their health status and survival abilities is a common factor of many studies in this respect [7,8].

The main aim of the present study is the profile of positive health and survival abilities in young women differing as to physical activity.

Thus formulated study aim was connected with answering the following question: do young women, undergraduate students at the Faculty of Tourism and Recreation, who declare daily physical activity substantially differ in the sense of positive health in all its aspects and in self-assessment of their survival abilities from those who declare only occasional activity?

## MATERIAL AND METHODS

The profile of women's positive health and survival abilities was defined on the basis of Kalina's original methodology [9] taking into account four basic indices: three health aspects (somatic – A, mental – B, social – C) and survival ability – D. The sense of intensity of particular detailed indices (8 aspects A, 4 B, 3 C, 8 D) has been evaluated in a scale from 1 to 5. Additionally, index "0" has been reserved to evaluate specific abilities (D).

The arithmetic mean for the assessed indices (after disintegration into diagnostic values), calculated for

particular sets (from A to D), is a general measure of the given health aspect or the survival ability. The arithmetic mean calculated for A to D indices represents the most general index of Sense of Positive Health and Survival Abilities (SPHSA).

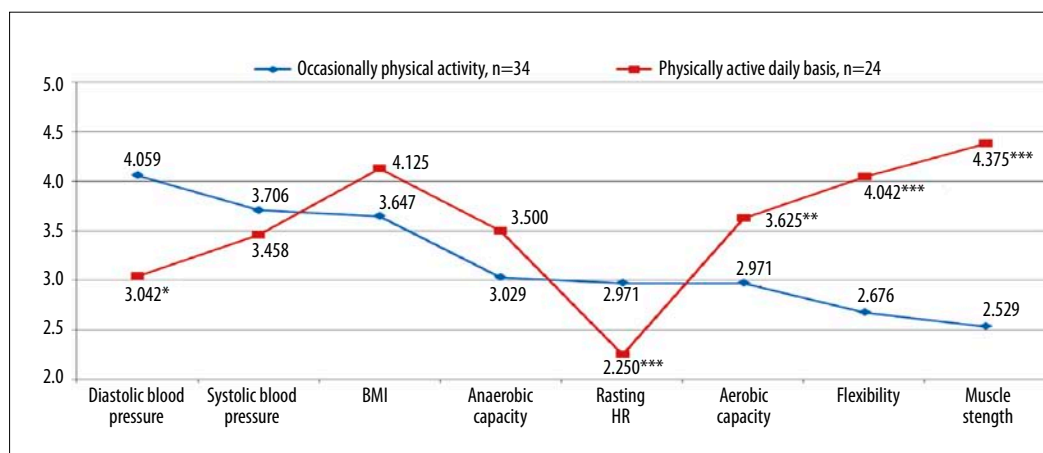
A group of female students from the Faculty of Tourism and Recreation at Gdańsk University of Physical Education and Sport who were completing their education at the undergraduate level (6<sup>th</sup> semester) were studied: 24 students declared daily physical activity, and 34 students the occasional one. The subjects' age was within the range of 20–23 years ( $21.24 \pm 0.99$ ). Their height and the body weight was: 157–181 cm ( $167.27 \pm 5.34$ ) and 41–77 kg ( $57.93 \pm 7.33$ ), respectively.

Students physically active every day prefer 8 sports disciplines and forms of physical activity: jogging (20%), swimming (16.7%), volleyball (16%), fitness (12.5%), dance, gym, rollerblades (8.3%), and horse riding (4.2%).

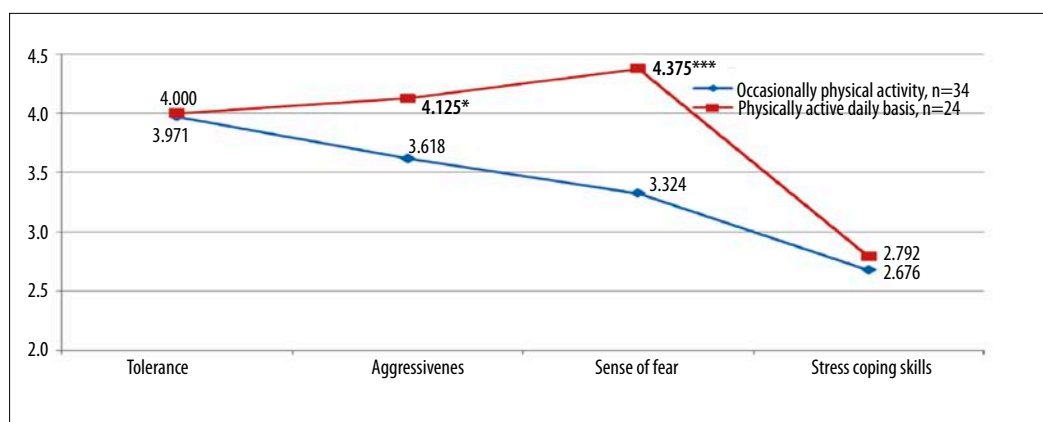
Students have been informed that findings would be used exclusively for scientific publication and will not be made available to other entities.

## RESULTS

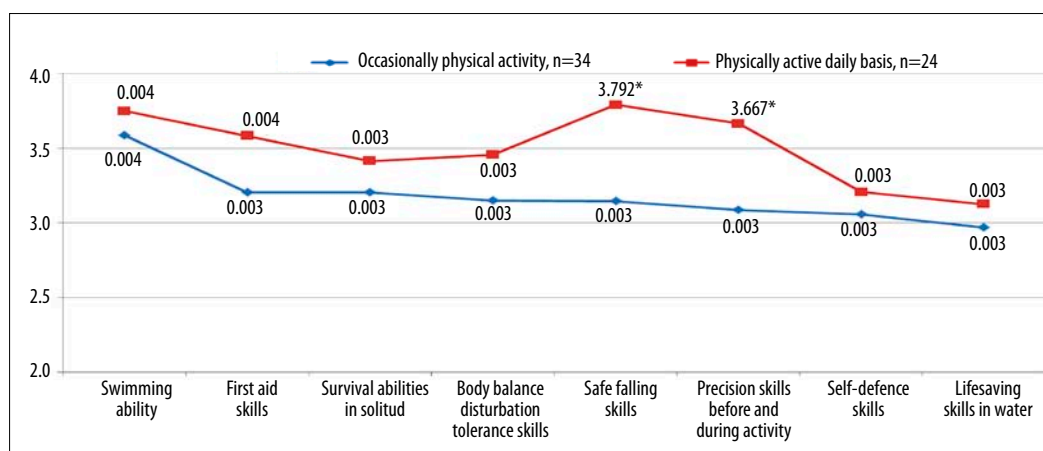
Women declaring daily physical activity surpass their occasionally active peers in the SPHSA index 3.740 and 3.427, respectively ( $p < 0.01$ ) (Figure 1). They assess the most highly the sense of social health (4.083 and 3.951), while the lowest the survival ability (3.5 and 3.165). Students who are active every day have demonstrated, at a statistically higher level than occasionally active women, a sense of the following detailed indices: aerobic capacity ( $p < 0.01$ ), flexibility ( $p < 0.001$ ), muscular power ( $p < 0.001$ ) (Figure 2), lesser aggressiveness ( $p < 0.05$ ) and anxiety ( $p < 0.001$ )



**Figure 2.** Declared values of indices of somatic health of female students of the faculty of tourism and recreation differing in terms of physical activity (ordinal variable: decreasing values of indices of women active occasionally), \*  $p < 0.01$ , \*\*\*  $p < 0.001$ .



**Figure 3.** Declared values of indices of mental health of female students of the faculty of tourism and recreation differing in terms of physical activity (ordinal variable: decreasing values of indices of women active occasionally) \*  $p < 0.05$ , \*\*\*  $p < 0.001$ .



**Figure 4.** Declared values of indices of survival abilities of female students of the faculty of tourism and recreation differing in terms of physical activity (ordinal variable: decreasing values of indices of women active occasionally), \*  $p < 0.05$ .

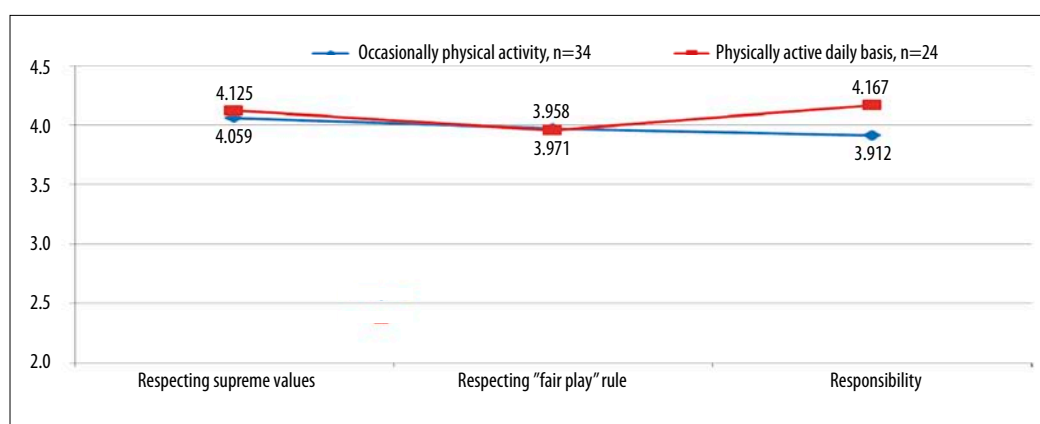
(Figure 3), the skill of safe falling ( $p < 0.05$ ), and the ability to act precisely before and after physical activity ( $p < 0.05$ ) (Figure 4).

Women active every day have indicated at a statistically lower level the HR at rest ( $p < 0.001$ ) and diastolic blood pressure ( $p < 0.05$ ) (Figure 2). Variability

**Table 1.** Estimation of the main empirical variables of female students from the Faculty of Tourism and Recreation differing in physical activity.

Empirical variable	Every day physical activity (n = 24)					Occasionally physical activity (n = 34)				
	$\bar{X}$	SD	$x_{min}$	$x_{max}$	$V_{\%}$	$\bar{X}$	SD	$x_{min}$	$x_{max}$	$V_{\%}$
Height [cm]	165.87	5.45	157	181	3.29	168.26	5.19	158	178	3.08
Weight [kg]	57.5	6.27	41	70	10.9	58.23	8.07	47	77	13.86
SPHSA** [points]	3.740	0.27	2.656	4.344	7.20	3.427	0.364	2.740	4.01	10.62
A – somatic health** [points]	3.552	0.54	2.375	4.375	15.32	3.195	0.486	2	4.12	14.97
B – mental health** [points]	3.823	0.56	3	4.75	14.62	3.397	0.523	2	4.25	15.39
C – social health [points]	4.083	0.52	3	5	12.79	3.951	0.615	2.667	5	15.56
D – survival abilities [points]	3.5	0.9	1.375	5	25.88	3.165	0.364	1.875	4.75	10.62

\*\* p<0.01.



**Figure 5.** Declared values of indices of social health of female students of the faculty of tourism and recreation differing in terms of physical activity (ordinal variable: decreasing values of indices of women active occasionally).

of the SPHSA index and aspects from A to C is similar in both groups – the variability coefficient ( $V_{\%}$ ) fluctuates within a range of 12–15% (Table 1). Only within the detailed indices of the D aspect (survival abilities), substantial diversification of assessment in the group of students active every day has been stated ( $V_{\%}=25.88$ ).

The characteristics of detailed indices based on the arithmetic mean and variability ( $V_{\%}$ ), demonstrated statistically significant differences and substantial diversity of particular sets of measurements in nine cases (out of 23 pairs of indices). The greatest variability of indices was revealed in “somatic health” (aspect A) from 16% to 57%. A considerable difference of the value of the anaerobic capacity index (0.471) and the BMI (0.478) did not prove to be statistically significant due to great variability of results in both groups (24% and 35%, respectively) (Figure 2).

The greatest variability in “the sense of mental health” (aspect B) amongst students active every day concerned the index of the “ability to overcome stress” ( $V_{\%}=32$ ), amongst those active occasionally – “aggressiveness” ( $V_{\%}=30$ ) (Figure 3). Aspect C (“social health”) does not diversify women in a statistically significant way (Figure 5). A great similarity of both standard deviations and the variability of particular indices are characteristic of this aspect.

Great variability of indices also regards “survival abilities” (aspect D). Amongst students active every day the variability of indices fluctuates from 25% to 44% (the biggest ones regarding the “ability to survive in seclusion”). Amongst active peers the scope of variability of indices is occasionally slightly smaller and fluctuates within the limits of 26–40% (the biggest one regarding “rescue abilities in water”).

## DISCUSSION

An analysis of findings of research on students of the Faculty of Tourism and Recreation who are physically active and inactive confirms substantial differences in the subjects' sense of positive health and survival ability (SPHSA). Students active every day surpass their occasionally exercising friends in this respect. The revealed peculiar profile of the sense of positive health and survival abilities in the group of active women is characterized by a distinct dominance of high assessment of the A aspect (somatic health) and of a low level of anxiety and aggressiveness. In this case this is understandable, as this group has preferred sports stimulating the development of muscle power, flexibility and aerobic capacity.

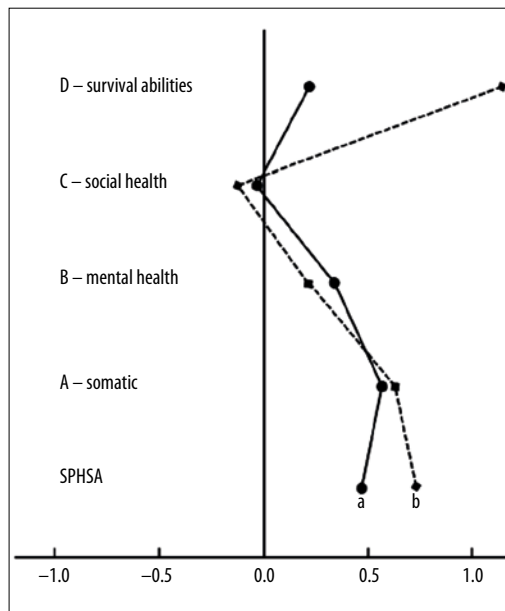
Research also confirms an influence of physical effort on the sense of somatic health among athletes and recreationally exercising persons [9,10]. Also respecting the rules of "fair play" is a condition of effective sports rivalry, hence aggressiveness is undesirable [11]. Therefore, students systematically practising sport confirm this situation by perceiving themselves as non-aggressive persons.

Moreover, Matveev's studies [12] confirm a correlation between the health status and people's tendency to aggressive behaviours and conflicts. Thus, as a rule, healthy persons are not aggressive.

In the context of the conducted studies it seems important to settle the following question – is the revealed profile of a sense of positive health and survival abilities influenced by other environmental factors, e.g.: the field of studies, a selection of preferred sports disciplines, the subjects' gender, etc. (apart from physical activity itself revealed in this study)? Unfortunately, comparative possibilities of results (referring to literature sources) is rather limited at present, because this is a new method which was approved of in 2012 (presented in one publication).

Comparing findings of research on students of tourism and recreation active daily with results obtained by students of physiotherapy [9], it is possible with certain caution (due to a small sample of the subjects) to talk about characteristic differences of both profiles.

Using the method of standardising (on a group of physiotherapy students active every day,  $n=22$ ) and a widely understood norm (one standard deviation), properties of both groups of physically active women are revealed. Above all, they concern an ability to tolerate disruptions of the body balance (2.37 SD), of muscle power (1.35 SD), and abilities to fall safely (1.5 SD). Greater differences of profiles are seen if we use the standard



**Figure 6.** Standardised values of profiles of positive health and survival abilities of physically active women. Legend: 0 – reference group (physically inactive students of physiotherapy,  $n=100$  [9]); a – physically active students of physiotherapy,  $n=22$  [9]; b – physically active students of tourism and recreation,  $n=24$ .

procedure of mathematical statistics (significance of differences of two independent groups). Muscle power and abilities to fall safely were revealed at a statistically significant level of differences ( $p \leq 0.001$ ), while flexibility at a high level of the credibility of differences ( $p \leq 0.01$ ) and HR at rest, diastolic blood pressure and the self-defence ability at a statistically justified level ( $p \leq 0.05$ ). These differences can probably result, not so much from different preferences of practised sports, but from the realization of different educational curricula. The examined students of the faculty of tourism and recreation, at which sports classes (also optional ones), e.g. self-defence or judo, constitute a considerable part of the curriculum, follow a program with a larger number of sports and physical exercises than students of physiotherapy.

Differences of profiles are also seen if the reference group for both groups of physically active women (of physiotherapy [9] and tourism and recreation) is composed of physically inactive students (field of physiotherapy,  $n=100$  [9]) – Figure 6. Characteristic features of both profiles are greater values of SPHSA (0.426 SD and 0.615 SD, respectively), somatic health – A (0.553 SD and 0.615 SD) and, in the case of tourism and recreation students, a characteristic dominance of a widely understood survival ability – D (1.139 SD). Tendencies revealed on the basis on standardised values also confirm the significance of differences of physically active groups compared to the group of inactive students of

physiotherapy (n=100). At a statistically justified level ( $p \leq 0.05$ ) differences of the SPHSA index were revealed (among students of physiotherapy), and at a high level of credibility of differences ( $p \leq 0.02$ ) – of somatic health – A (students of tourism and recreation). At a statistically significant level of differences ( $p \leq 0.001$ ) SPHSA and the survival ability – D were revealed (students of tourism and recreation).

The new methodology applied in the research (SPHSA questionnaire) constitutes a very interesting method of the sense of health assessment conducted in all its aspects. Its advantage lies not only in a possibility of applying it in virtually in all conditions, but also in low costs (a non-apparatus method), which is quite important in population studies [13]. The findings of the SPHSA questionnaire can be successfully associated with findings of questionnaires of physical activity assessment (e.g. Leisure Time Physical Activity Questionnaire Minnesota, Paffenbarger Physical Activity Questionnaire, Seven Day Physical Activity Recall [14–17]), including the elderly and the impaired.

## CONCLUSIONS

Findings of the conducted research show that physical activity is a crucial factor modifying the sense of positive

health in physically active and inactive women, above all in its somatic and psychological aspect and in some elements associated with the survival ability. To a lesser extent physical activity diversified the sense of the studied women's social health.

Quite likely, also the type of physical activity (the preferred sports discipline) and the profile of education (field of study) can be a modifying factor for the women's sense of positive health and survival abilities.

However, taking into consideration the small number of subjects in the groups of examined women, findings of our research and of Kalina's research [9] should be treated as a revealed tendency. Hence it is necessary to confirm (or prove false) this probable hypothesis that intensifying daily physical activity is a factor significantly diversifying the sense of one's own positive health and survival abilities. Verification of this hypothesis requires further observation on a much greater sample from populations of persons differing in age, profession, education, etc., but simultaneously in physical activity. A reply to the question whether the declared profile of the sense of positive health and survival abilities of persons with everyday physical activity is in greater accordance with the diagnosed profile (empirically verified) than of persons with occasional physical activity is an even more interesting issue.

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