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## Self-assessment of health and physical fitness by young adults practising sport

Małgorzata Kałwa<sup>1</sup>, Halina Guła-Kubiszewska<sup>2</sup>, Urszula Dębska<sup>3</sup>, Wojciech Starościak<sup>2</sup>

<sup>1</sup>University School of Physical Education in Wrocław, Chair of Sport Didactics

<sup>2</sup>University School of Physical Education in Wrocław, Chair of Pedagogy of Physical Culture

<sup>3</sup>University of Wrocław, Institute of Psychology

Address for correspondence: [malgorzata.kalwa@awf.wroc.pl](mailto:malgorzata.kalwa@awf.wroc.pl)

Akademia Wychowania Fizycznego we Wrocławiu, al. Paderewskiego 35, 51-612 Wrocław.

Authors' contribution:

Małgorzata Kałwa, PhD – 40% - concept of the study, research execution, collecting the literature, statistical calculations and graphic design, manuscript preparation,

Halina Guła-Kubiszewska, – 20% - research organisation, research execution, database creation, manuscript approval,

Urszula Dębska – 20% - research execution, database creation,

Wojciech Starościak – 20% – database, statistical calculations.

## **Abstract**

**Introduction:** Practising sport and engaging in physical activity at a young age is meant to increase the level of a person's physical fitness and health. Yet, the generation of 20-year-olds – former and active sportspersons – assess their general physical fitness and health as worse than good. Therefore, does practising sport, in the self-assessment of young persons, really improve one's health and physical fitness?

**Purpose:** The purpose of this research was to diagnose the subjective assessment of fitness and a sense of health among young adults practising sport as well as former sportspersons in comparison with the self-assessment of non-training persons.

**Materials and methodology:** 1153 adult persons aged 19-28 were surveyed. Those persons were supposed to perform a self-assessment of their health and physical fitness and report the pain disorders that they experienced. The group surveyed included 484 ex-sportspersons, 450 active sportspersons and 212 persons who had never practised sport. The survey used a 1-5 assessment scale.

**Results:** The survey participants assessed their general physical fitness level at  $3.82 \pm 1.00$  and their health level at  $3.88 \pm 1.10$ . In comparison with the other groups the sportspersons gave their fitness a better mark despite the largest number of pain disorders experienced. The result of health self-assessment did not differ among the groups. Sportspersons and ex-sportspersons indicated injuries and the pain felt, especially in the cervical and thoracic spine, the hips and the head, and complained more frequently about shortness of breath.

## **Conclusions:**

Practising sport at a young age does not significantly alter the self-assessment of health among young persons. An average sportsperson experiences at least one pain disorder that correlates with a lower sense of good health. The highest frequency of associated pain disorders is observed in sportspersons, with the pain being located mainly in the area of the cervical and thoracic spine and the hips. The frequency of pain in the lower limbs is inversely proportional to one's overall training period.

**Keywords:** self-assessment, sense of health, physical fitness, pain, sportspersons.

## **Introduction**

Pro-health behaviours of adult persons are dependent on many factors, including, among other things, their upbringing, life experience or health education [1-5]. One of the factors determining a person's lifestyle and attitude to health is active participation in physical culture in their youth. Young adults are particularly susceptible to both positive and negative aspects of behaviour that lead to lifestyle and health changes [6-11]. Therefore, the diagnosis of the self-assessment of health at that stage in life makes it possible to identify the level of awareness of young people who are at the start of their professional career, with regard to their perception of health, responsibility for one's own health or the role of a health educator [7,8,12]. At the same time, early identification of risk groups enables us to understand health problems present among young people and allows us to predict the future health status of the working population. Such projections help plan activities aimed at preventing the foreseeable, diverse health problems in later life, which may significantly contribute to the lowering of social costs [13, 14].

Practising sport and engaging in physical activity at a young age is meant to increase a person's level of physical fitness and health. Yet, the generation of 20-year-olds – former and active sportspersons – often complains about dysfunctions resulting from numerous injuries. Therefore, does practising sport during one's adolescence and youth really fulfil its assigned functions at individual stages of sport training? The research of Sozański et al [16] indicates that the average sportsperson in Poland who scores points, which are the main criterion for the financing of clubs, is ca. 14 years of age, reaches the peak of their sport career at the age of 18 and ends it a year later. The most worrying trend is, as indicated by the authors, a small group of fully healthy sportspersons entering the field of competitive sport. In the view of many authors [17-19], the most frequent reason for ending one's sport career is the lack of adequate fitness due to injuries and their psychological effects. For this reason, in order to ensure that practising sport at a young age results in a high level of physical fitness and health in the later life of ex-sportspersons, it is necessary to take significant steps with regard to the assessment of the motor, health and educational needs of the participants of this process. Raising young people's awareness of the necessity to take note of their psycho-motor needs and engage in pro-health behaviours may significantly contribute to a change in the lifestyle of subsequent generations and improve the number of active sportspersons at the specific training stage.

The purpose of this research was to diagnose the subjective assessment of fitness and a sense of health among young and former sportspersons in comparison with the self-assessment of non-training persons.

## Material and methods

A diagnostic survey was made among 1153 young Poles aged 19-28 ( $21.0 \pm 2.62$  on average) regarding the self-assessment of health and physical fitness and pain disorders, if any. The persons surveyed were divided into the following groups: sportspersons, ex-sportspersons and non-training persons (Fig. 1). The questionnaire included 13 closed-ended questions, 5 of which could be supplemented by the person surveyed with brief open statements (appendix No. 1). The survey was conducted on groups of 25-40 persons, who had an unlimited time for responding to the questions. The results were collected over a period of 3 months. The self-assessment scale included the following five levels: 1- bad, 2- poor, 3- satisfactory, 4- good, 5- very good.

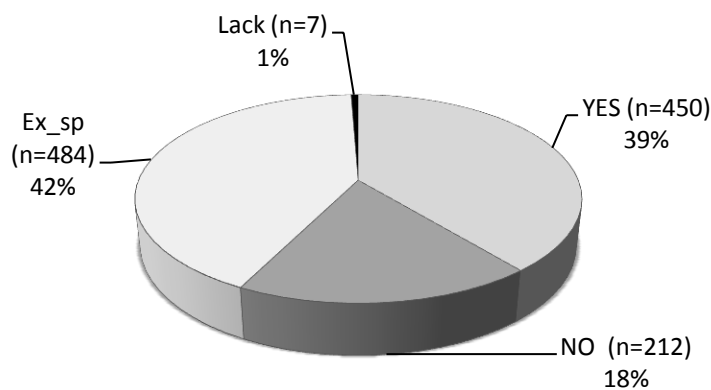


Fig. 1. Percentage of active sportspersons, ex-sportspersons and non-training persons in the group surveyed.

The results were described on the basis of a quantitative and qualitative analysis using the Excel 10 and Statistica 12 software.

## Results

The group surveyed included students of the Academy of Physical Education in Wroclaw ( $n=953$ ) and the Institute of Psychology of the University of Wroclaw ( $n=200$ ). The group surveyed ( $n=1153$ ) assessed their general physical fitness at the average level of  $3.82 \pm 1.00$  and their health at  $3.88 \pm 1.10$ .

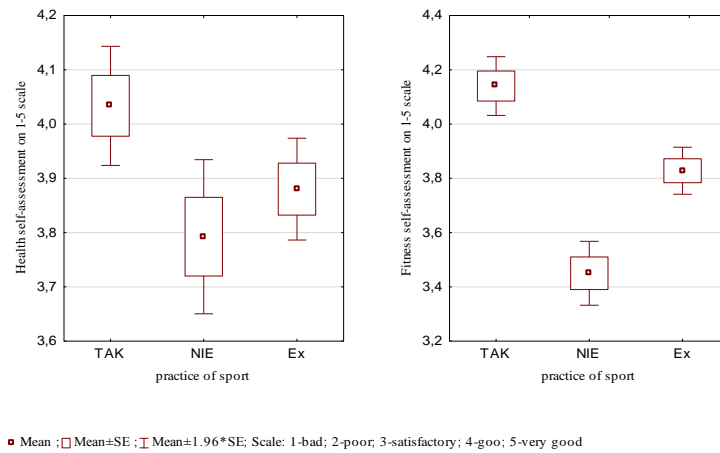


Fig. 2. Self-assessment of physical fitness and health according to participation in sport with a division into subgroups, TAK: Sportspeople, NIE: Non-sportspeople, Ex: Ex-sportspeople.

Among sportspeople, the average result of the subjective assessment of physical fitness and health was good: 4.03 ± 1.18 for health and 4.14 ± 1.17 for physical fitness. Ex-sportspeople assess both of those parameters at a level slightly lower than good, i.e. physical fitness at 3.88 ± 1.05 and health at 3.83 ± 0.97. That was a better result than in the case of non-training people, who assessed their physical fitness at 3.45 ± 0.87 and health at 3.79 ± 1.06 (Fig. 2). Analysing qualitative data for each value on the assessment scale, one notices a prevalent group of the people surveyed who diagnose their fitness and health as good or very good.

What is, however, worrying, is a relatively high percentage of young people (mainly from the sport institution, where nearly half of those surveyed practised sport) who assess their health as less than good (23%), and the fact, in the case of fitness, as many as 27% of those surveyed regarded their capabilities as worse than good (Fig. 3).

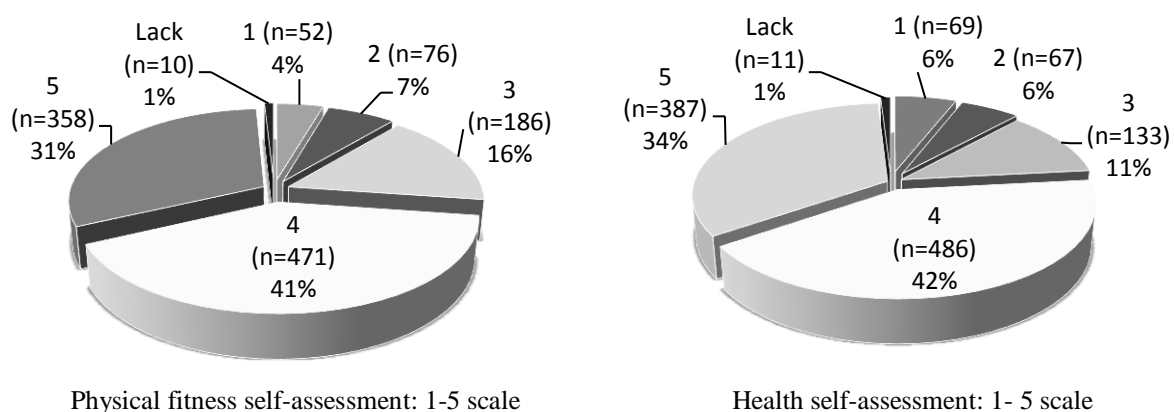


Fig. 3. Sizes of groups (n) according to their self-assessment on the 1-5 scale, where: 1- bad; 2- poor; 3- satisfactory; 4- good; 5- very good.

Another worrying fact is the frequency of pain in the musculoskeletal system declared by those surveyed. Dysfunctions were more frequently reported by women; however, the prevailing type of disorder in both sexes is pain in the sacral area. That problem was reported by as many as 57% of all those surveyed. In addition, 44% of the respondents complain about headaches and 39% experience shortness of breath (Fig. 4). That phenomenon is visible, in particular, in sportspersons and ex-sportspersons, who exhibited the highest frequency of associated pain disorders (Figs. 5-7, Table 1). What is noteworthy is the lack of pain reported by 1.3% of all the survey participants, all of them men. 10% of other health disorders indicated by the persons surveyed included, among other things: being overweight, bad posture, upper and lower abdominal pain, carpal bone, ankle and foot pain, excessive sleepiness, general malaise, multisystem muscle and joint pains and nose bleeding. Those results, as a whole, significantly lower the outcome of health and physical fitness self-assessment among sportspersons (Table 2).

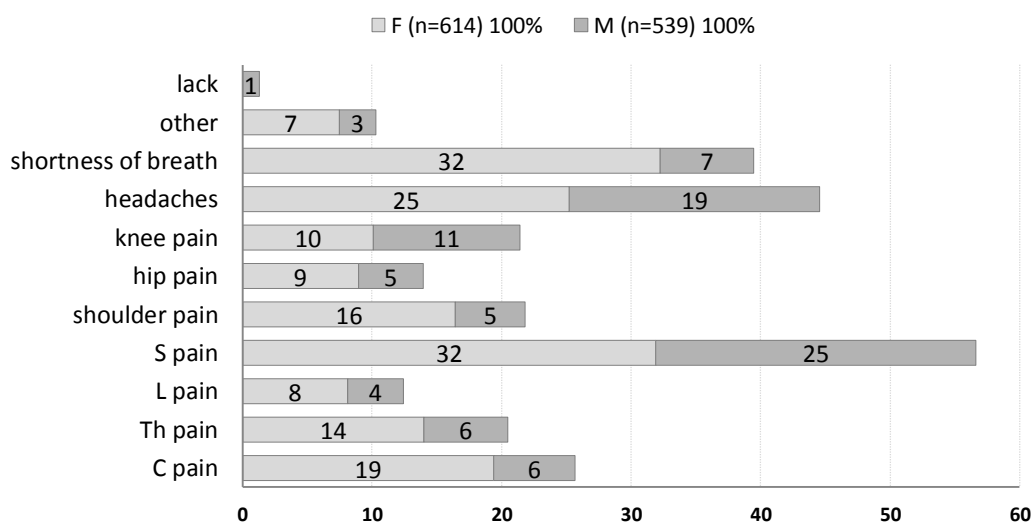


Fig. 4. Percentage of women and men declaring pain disorders according to their location.

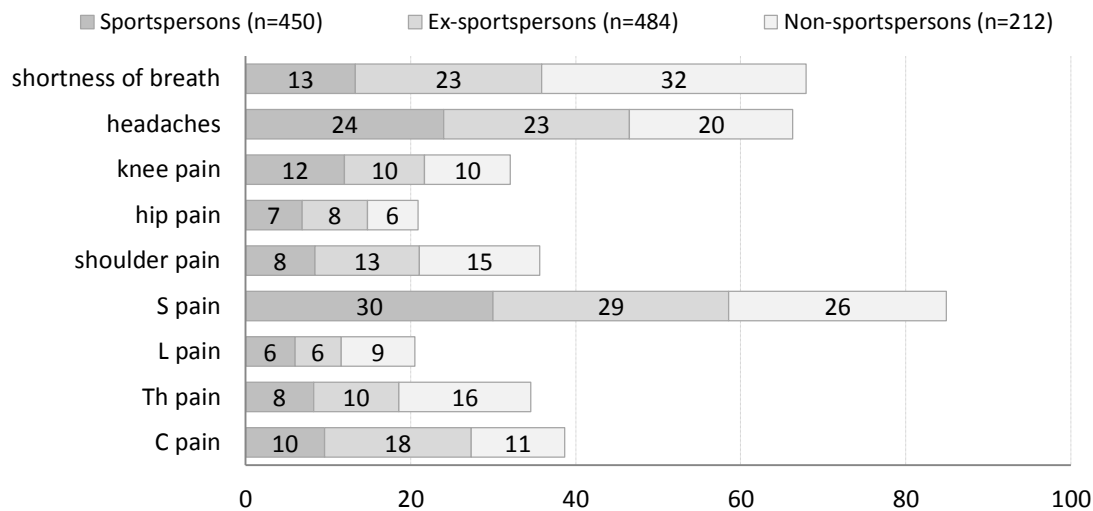


Fig. 5. Percentage of persons experiencing pain, with the practice of sport being taken into account.

Table 1 Intergroup differences with regard to the parameters measured. Variance analysis. Significant effects, i.e. where  $p < .05$ , are highlighted.

Variable	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
C pain	<b>8.79</b>	<b>42</b>	<b>0.21</b>	<b>99.7</b>	<b>862</b>	<b>0.12</b>	<b>1.81</b>	<b>0.0015</b>
Th pain	<b>6.27</b>	<b>42</b>	<b>0.15</b>	<b>71.6</b>	<b>862</b>	<b>0.08</b>	<b>1.80</b>	<b>0.0016</b>
L pain	<b>3.37</b>	<b>42</b>	<b>0.08</b>	<b>45.6</b>	<b>862</b>	<b>0.05</b>	<b>1.51</b>	<b>0.0204</b>
S pain	9.23	42	0.22	177.4	862	0.21	1.07	0.3579
hip pain	<b>5.73</b>	<b>42</b>	<b>0.14</b>	<b>80.1</b>	<b>862</b>	<b>0.09</b>	<b>1.47</b>	<b>0.0293</b>
shoulder pain	2.84	42	0.07	56.6	862	0.07	1.03	0.4241
knee pain	2.51	42	0.06	83.3	862	0.10	0.62	0.9736
headaches	7.28	42	0.17	155.6	862	0.18	0.96	0.5454
shortness of breath	<b>25.16</b>	<b>42</b>	<b>0.60</b>	<b>111.0</b>	<b>862</b>	<b>0.13</b>	<b>4.65</b>	<b>0.0000</b>
Other	<b>3.08</b>	<b>42</b>	<b>0.07</b>	<b>37.9</b>	<b>862</b>	<b>0.04</b>	<b>1.67</b>	<b>0.0054</b>
Health	46.3	42	1.10	1091.9	858	1.27	0.87	0.7124
Fitness	<b>79.12</b>	<b>42</b>	<b>1.88</b>	<b>986.4</b>	<b>860</b>	<b>1.15</b>	<b>1.64</b>	<b>0.0069</b>

When analysing the results aggregated according to the sport status, one may notice that, while the physical fitness assessment varies considerably among the groups, the health assessment outcome for the average sportsperson, ex-sportsperson and non-training person may be regarded as similar (Fig. 6, Table 1).

Table 2. Correlations between the dysfunctions reported and other parameters indicating a person's lifestyle (n=1130). The results where p<0.05 are highlighted.

Parameters	Specialisation	Sex	Body mass	Training period	Chronic disease	Sum of disorders	Health	Fitness	Active	Former	Regular activity	Periodic activity
	C pain	<b>-0.08</b>	<b>-0.19</b>	<b>-0.14</b>	<b>0.07</b>	<b>0.51</b>	<b>0.21</b>	<b>-0.10</b>	-0.05	-0.04	<b>0.09</b>	<b>0.08</b>
Th pain	<b>-0.08</b>	<b>-0.12</b>	<b>-0.09</b>	0.03	0.01	<b>0.46</b>	<b>-0.11</b>	<b>-0.11</b>	<b>0.08</b>	<b>0.06</b>	<b>0.11</b>	-0.01
L pain	0.00	<b>-0.08</b>	-0.04	0.03	<b>0.07</b>	<b>0.34</b>	-0.06	-0.02	0.04	0.01	0.04	<b>-0.12</b>
S pain	0.05	<b>-0.07</b>	-0.05	0.02	0.01	<b>0.55</b>	<b>-0.06</b>	-0.02	-0.04	-0.03	0.03	-0.05
hip pain	<b>-0.07</b>	<b>-0.18</b>	<b>-0.13</b>	0.02	-0.01	<b>0.53</b>	<b>-0.07</b>	<b>-0.10</b>	0.04	<b>0.07</b>	<b>0.13</b>	-0.01
Shoulder pain	0.00	<b>-0.07</b>	<b>-0.07</b>	0.00	0.00	<b>0.41</b>	<b>-0.09</b>	-0.05	-0.03	0.01	0.00	0.01
knee pain	-0.02	0.02	0.04	<b>-0.07</b>	-0.02	<b>0.45</b>	-0.05	0.00	-0.01	-0.03	0.00	<b>-0.08</b>
headaches	0.02	<b>-0.07</b>	<b>-0.07</b>	-0.03	0.03	<b>0.53</b>	<b>-0.09</b>	-0.05	-0.04	-0.03	0.00	0.01
Shortness of breath	<b>-0.21</b>	<b>-0.31</b>	<b>-0.24</b>	0.01	<b>0.10</b>	<b>0.55</b>	<b>-0.14</b>	<b>-0.18</b>	<b>0.13</b>	<b>0.14</b>	<b>0.30</b>	<b>-0.09</b>
Other	<b>-0.09</b>	<b>-0.10</b>	-0.05	-0.01	<b>0.14</b>	<b>0.31</b>	<b>-0.07</b>	<b>-0.07</b>	0.04	<b>0.07</b>	<b>0.07</b>	0.00
Sum of disorders	<b>-0.09</b>	<b>-0.24</b>	<b>-0.17</b>	0.00	<b>0.08</b>	1.00	<b>-0.18</b>	<b>-0.14</b>	0.04	<b>0.06</b>	<b>0.17</b>	<b>-0.08</b>

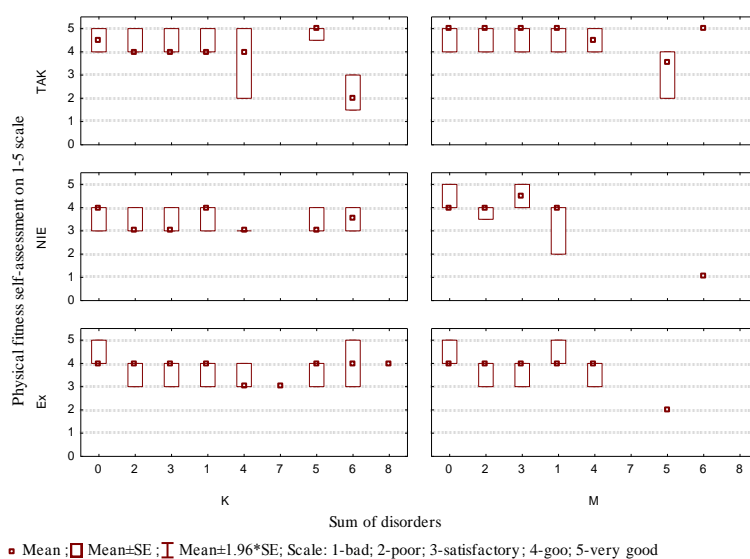


Fig. 6. Subjective fitness assessment in groups distinguished according to their sport status and sum of disorders, TAK: Sportspersons, NIE: Non-sportspersons, Ex: Ex-sportspersons, K- female, M – male.



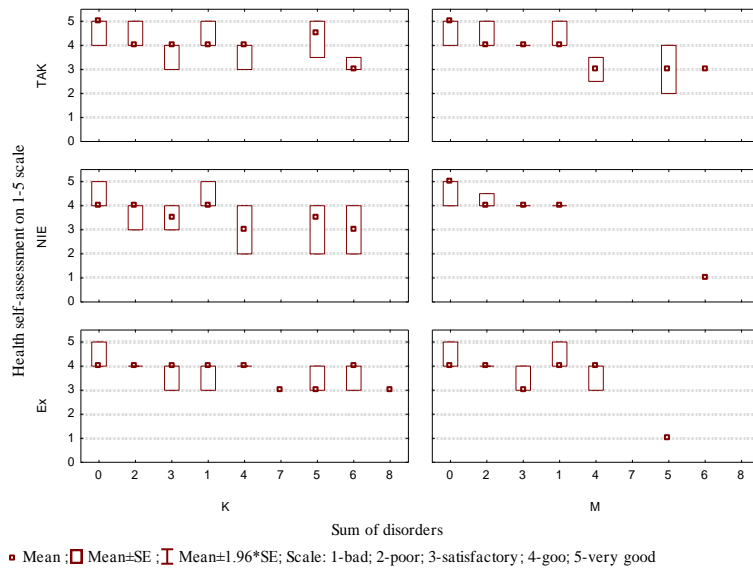


Fig. 7. Subjective health assessment in groups distinguished according to their sport status and sum of disorders, , TAK: Sportspersons, NIE: Non-sportspersons, Ex: Ex-sportspersons , K – female, M – male.

An association was also found between the outcome of the health and physical fitness self-assessment and the sum of disorders listed by the group of 20-year-olds (Figs. 8, 9). In the entire group surveyed (n=1153), health self-assessment values become lower as the number of disorders increases. A similar trend may be observed in the case of fitness, except for the sum of dysfunctions at level 8, which is a single occurrence (a female ex-sportsperson) and has no bearing on the final conclusions. However, a detailed analysis of persons with multiple pain complaints (2 or more disorders) indicates that this group is made up of as many as 57% of those surveyed (23% of sportspersons, 25% of former sportspersons and 9% of persons who have never practised sport) (Fig. 10). It is a fairly worrying trend, considering the age and future occupation of those surveyed. The relationship between health and fitness self-assessment in individual subgroups also reveals that both active and former sportspersons have a higher sense of physical fitness than health, while non-training persons clearly make a good fitness outcome conditional on the outcome of their health self-assessment (Fig. 10, Table 2).

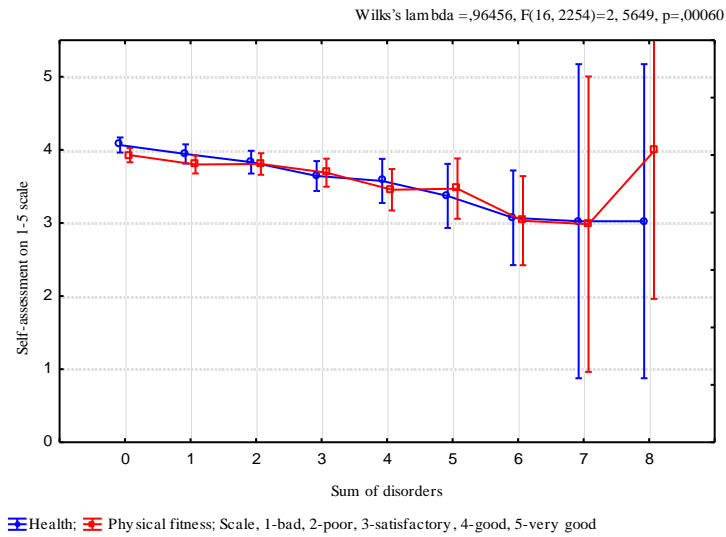


Fig. 8. Relationship between the average results of fitness and health self-assessment and the sum of disorders reported by the persons surveyed.

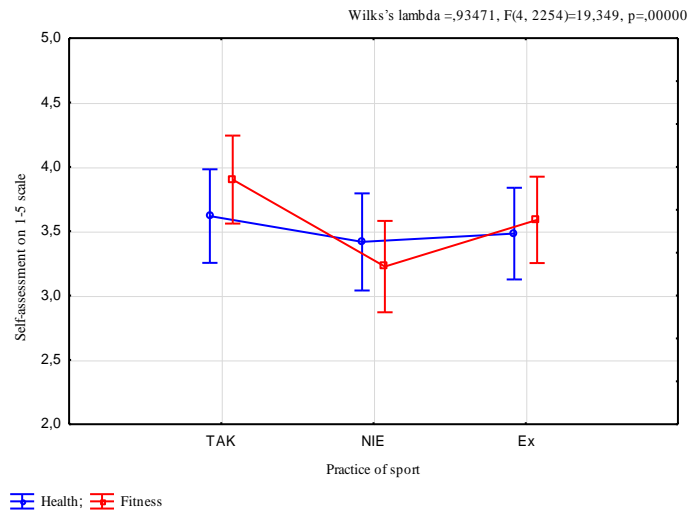


Fig. 9. Relationship between the average results of fitness and health self-assessment and the sport status, , TAK: Sportspersons, NIE: Non-sportspersons, Ex: Ex-sportspersons.

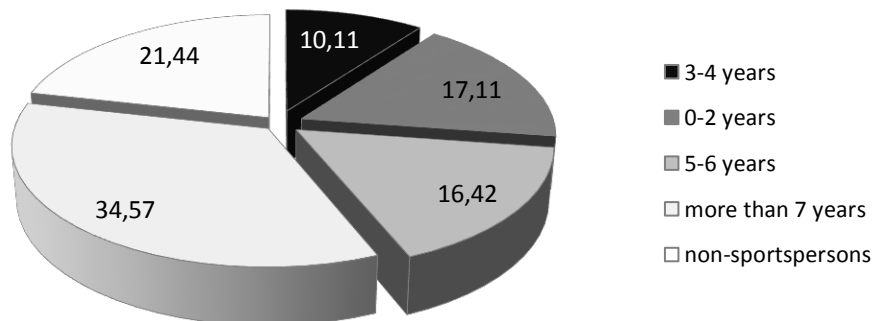


Fig. 10. Percentage of sportspersons experiencing pain depending on their overall training period.

Sportspersons usually point to spine pain in the cervical, lumbar and sacral sections as associated disorders, with single significant dependencies between the practice of sport and the pain location being observed in the cervical and thoracic spine area, as well as hip pain. The frequency of pain in the cervical section in sportspersons is proportional to their overall training period. A similar dependency is also observed in the case of headaches and shortness of breath. Among the disorders listed in the ex-sportsperson group a significant result was found in the case of shortness of breath, and the pain is most frequently located in the cervical section (Table 2). Also noteworthy is a higher frequency of knee pain in persons with a shorter overall training period and a higher frequency of cervical and thoracic spine pain in persons engaging in regular physical activity.

The entire group surveyed (n=1153) reported numerous co-existing disorders, which translates into a subjective health assessment in which a good and very good result correlates with the lack of pain and a worse result of a physical fitness self-assessment is only influenced by hip pain and shortness of breath.

Table 3. Correlations between parameters of those surveyed and sport activity.

Parameters	Sex	Body mass	Chronic disease	Health self-ass.	Fitness self-ass.	Regular activity	Periodic activity
Active sportspersons	<b>-0.23</b>	<b>-0.15</b>	0.07	<b>-0.07</b>	<b>-0.15</b>	<b>0.47</b>	<b>-0.08</b>
Former sportspersons	0.01	0.02	-0.03	-0.04	-0.02	<b>-0.08</b>	0.01
Overall training period	-0.04	-0.02	0.00	0.04	0.05	0.06	-0.05

An analysis of statistically significant dependencies between the dysfunctions declared and selected parameters related to young people's interests and lifestyle may lead one to conclude that the pain disorders assessed are more frequent in women. Interestingly enough, ex-sportspersons, having significant health problems, more rarely take up regular and periodic physical activity other than sport activity (Table 3).

## Discussion

Optimal health is defined as a dynamic balance between physical, emotional, social, spiritual and intellectual health. A change in a person's lifestyle may be made easier thanks to combining educational experiences from different areas which increase awareness and motivation, develop skills and, more importantly, make it easier to gain access to communities that create and support positive health practices [20].

Young people entering the field of sport encounter a combination of such educational experiences. However, as demonstrated by research, this does not always turn out well. Many young people end their sport careers too early [16-19]. Sport injuries and harm are an inherent risk related to the practice of sport, where the etiology and pathomechanics of injuries is an outcome of a specific set of circumstances. Unfortunate incidents aside, the typical injuries are those resulting from the overload of the musculoskeletal system [21]. In the case of healthy and young persons the cause of all the mishaps is usually racing against time and space, without taking into account the body's adaptive and compensatory capacity [21, s. 6, 22-24].

This research refers to a well-known topic of continuous relevance. The prevailing type of pain in both sexes is pain in the sacral area (Fig. 4), which was reported by as many as 57% of all those surveyed. In addition, 44% of the respondents complain about headaches and 39% experience shortness of breath. Bodily dysfunctions were reported mainly by women, who were most frequently affected by headaches and shortness of breath. That result differs from research performed by Brzozowska [26], who found that men were more prone to injury. 10% of other health disorders indicated by the persons surveyed included, among other things: being overweight, bad posture, upper and lower abdominal pain, carpal bone, ankle and foot pain, excessive sleepiness and general malaise. Those results, as a whole, significantly lower the outcome of health and physical fitness self-assessment among sportspersons (Table 2). Worthy of comment is a statistically significant relationship between the practice of sport and "other" disorders. The symptoms described by sportspersons are typical for overloading and overtraining [27]; it is, therefore, a problem not only of medical and educational, but also of methodological nature. This study focuses on health and physical fitness self-assessment in the context of existing disorders in the following three groups: sportspersons, ex-sportspersons and persons not practising sport. Similar research was conducted by Kopeć et al [17], who analysed both the results of physical fitness self-assessment among sportspersons (within one discipline), using the same scale, and proneness to injury. They found, among other things, a higher average fitness score in sportspersons and a lower (4-5%) percentage of persons declaring very good marks. Good marks were recorded at a similar level of 41-42%. They also confirmed a high percentage (more than 20%) of persons assessing their fitness as worse than good. Those facts not only raise doubts as to the system of sport training, but also call into question the professionalism and motives of the coaching staff at individual stages of sport training, especially given the fact that the majority of sportspersons sustain injuries during training. Whilst the goals and actions of coaches and

sportspersons at the specific stage of the training process are clear (striving to achieve a sport result using all optimal means), setting such goals at the stage of introductory and basic sport training will only result in the effects described in this study [28]. Therefore, if the tendency consisting in the shortening of the path to sport success by sportspersons and coaches is maintained (despite the limited capabilities of the musculoskeletal system of a growing organism and the immaturity of the nervous system), it will be another step towards a long-term decline of both the Polish sport and societal health.

The results obtained as part of this survey are difficult to accept for the surveyed population of persons in whom significant somatic and functional disorders were found (an average of  $1.3 \pm 1.34$  injury per person surveyed), as the survey participants were young persons entering the job market in the field of education and physical activity?! Therefore, those understandable concerns apply not only to that population, but also to persons they are going to coach.

A long-term neglect of school sport has led to a decline in the field of physical culture and amateur sport and we are already bearing the social, educational and sport-related costs of the numerous reforms of education on each of its levels [25]. A population of young, healthy people who are willing to take on sport challenges is being slowly rebuilt. However, 'health promotion is an art and science of helping people to discover the fundamental synergies between their passions and optimal health, increasing their motivation in their quest for optimal health and supporting them in changing their lifestyle, so that they could take proper steps towards the state of optimal health' [20].

## **Conclusions**

1. Ca. 27% of the surveyed population of young people entering the job market in the physical activity sector experience pain in the musculoskeletal system.
2. Active and former sportspersons assess their general health at a level similar to that of the group of non-training persons.
3. Physical fitness self-assessment is different among sportspersons, ex-sportspersons and persons not practising sport and has been defined as good.
4. The average sportsperson experiences at least one pain disorder that lowers his sense of health.
5. Associated somatic problems are most frequently observed in the group of ex-sportspersons. The pain disorders experienced and their number do not affect the outcome of physical fitness self-assessment among sportspersons and ex-sportspersons.

6. In sportspersons pain is more frequently observed in the cervical and thoracic spine and hip area. Shortness of breath and headaches were also reported.
7. In ex-sportspersons the pain is located in the thoracic spine and knee area.
8. A longer overall training period is conducive to pain in the cervical spine, while pain in the lower limbs was more frequent in sportspersons with a shorter overall training period.

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