

# Physical Activity, Health and Physical Fitness of Students, Their Parents and Grandparents

Maria Alicja Nowak<sup>1</sup>, Katarzyna Kotarska<sup>1</sup>, Leonard Nowak<sup>1</sup>

<sup>1</sup>Department of Physical Culture and Health Promotion, University of Szczecin, Szczecin, Poland

## ABSTRACT

*The aim of the work was to compare physical activity, taking care of one's health and self-evaluations of physical fitness and health of subjects from three successive generations. Research conducted between 2013–2017 embraced 1,580 subjects, including 400 students engaged in physical culture and health promotion, their 496 parents and 684 grandparents. The diagnostic survey method was used, applying a questionnaire, interview and observation. Standard statistical methods were applied: trait frequency,  $\chi^2$  test and multiple correspondence analysis. It was found that physical activity, caring for one's health and self-evaluation of health and physical fitness were more similar within one generation (male student vs. female student, mother vs. father, grandmother vs. grandfather) than between adjacent generations (students vs. parents, parents vs. grandparents). The behavior and self-evaluation of female students, analyzed within the same sex, were similar to those of their mothers and grandmothers; the behavior and self-evaluation of male students were similar to those of their fathers and grandfathers. Physical activity, caring for health and self-evaluation of physical fitness and health were determined by age, sex, marital status, place of residence and education. The continuation of research in this field is of major importance in the health prevention of Polish society.*

**Key words:** *intergenerational relations, students, parents, grandparents, health-oriented physical activity, self-evaluation of health and physical fitness*

## Introduction

The process of leading society into systematic physical activity is a serious civilization challenge of the 21st century. The links between physical activity and health indicate that undertaking physical activity is not only a choice but also an obligation for each individual. Physical activity in leisure time provides people with relaxation, fun, regeneration of the body after stressful work or self-realization, and it is a behavior aimed at health improvement<sup>1,2</sup>. The manifold positive effects of the activity bring people closer to physical, mental and social well-being, which, according to world standards, is health. Insufficient physical activity results in diseases<sup>3–8</sup> lowering the quality of life of the individual<sup>9</sup>, and consequently contributing to the increase in the cost of treatment and social care of people of different ages<sup>10</sup>.

Systematic studies of representative groups of Poles prove that in 2017 physical activity in free time was undertaken by only 16.1% of people aged 15–69. The norms of activity recommended by the WHO were met by 87.6% of people<sup>11</sup>, if we take into account the total of all its forms

(physical activity in free time, professional activity, work in and around the house, and activity connected with moving from place to place). Physical activity of typical villagers, dominated by physical work, is slightly different. In a rural lifestyle, there is little room for family physical recreation, which occurs sporadically, most often on weekends and days off work<sup>12</sup>. Some promising changes can be seen in the patterns of physical recreation and active leisure, transferred to the countryside by migrating city dwellers. Transformations in the countryside, including the loss of its original agricultural functions in favor of, among others, the service sector, have had an impact on the lifestyle of its inhabitants<sup>13</sup>.

In studies involving younger generations, subjects' physical activity level tended to decline as they progressed to higher levels of education. It seems that Polish school education should place greater emphasis on raising the awareness of the health benefits of physical exercise and inculcating the habit of body regeneration<sup>14</sup>.

Engaging in health enhancing behaviors depends on the living environment, which shapes and preserves the behavior patterns of an adolescent person. The family is responsible for the socialization and upbringing of its members. In addition to the procreative and economic functions, it also has the socializing, educational, cultural, emotional-expressive and recreational ones. The recreational function indicates the possibility of using family participation in physical culture, as well as children, parents and grandparents' psychophysical rest. Spending free time with each other, common games and plays, occurring in a joyful atmosphere, increase the family's chances of being together and passing on fundamental life values. This impact is multifaceted and includes relationships between generations<sup>15</sup>. Health, a successful marriage and having children have been valued by Poles for many years<sup>16</sup>. Research has confirmed that the highest life value for women undertaking systematic physical activity was health and family happiness, followed by physical fitness, a clear conscience and a good financial situation. Parallel recognition of the value of health and the value of physical fitness by women, affected their implementation of the majority of analyzed health-related behaviors<sup>17</sup>, and the sustainability of their recreational activity<sup>2</sup>. Patterns of parents' physical activity influence the current physical activity of the young generation and may result in the sustainability of this activity in adulthood<sup>18</sup>. It was found that fathers and mothers had a similar effect on the level of physical activity of their offspring, regardless of sex<sup>19</sup>. The influence of one's parents' involvement on the development of their sports career has been documented in research on elite sports persons. In addition, the athletes often stressed that their parents had also been active competitors in the past<sup>20</sup>.

In a CBOS (Public Opinion Research Center) survey of a representative group, it was found that Poles also owed their passion for sport to their grandparents<sup>21</sup>. The position and role of older people have evolved over the centuries. Grandparents have often taken the responsibility for bringing up the young generation. Today, grandparents are sometimes people in their prime, physically fit and professionally active. Research shows that relationships between grandchildren and grandparents are very strong in Poland. Grandparents pass on basic moral principles<sup>22</sup>, they transmit essential life values. The number of people aged 65 and more amounted to around 5.7 million at the end of 2013, with the total population of Poland being 38.5 million. According to forecasts, in 2050, people aged at least 80 will account for 10.4% of the country's population<sup>23</sup>. Determining the relationships of physical activity, caring for health and self-evaluated physical fitness and health in relation to three generations in the immediate family, has therefore a significant social significance.

The study of physical activity of students of physical education, tourism, physiotherapy and public health, who are aware of the health benefits of physical exercise, in relation to the behavior of their parents and grandparents, who are rich in life experience, is an attempt to

demonstrate the transmission of behaviors connected with physical activity and caring for health across three generations.

The aim of the work was to determine physical activity, caring for health and self-evaluation of physical fitness and health within three generations in the immediate family.

The following hypotheses were formulated:

1. Patterns of physical activity and caring for health are similar in one generation.
2. Within one sex, patterns of physical activity, caring for health and self-evaluation of health and physical fitness are transmitted.
3. With regard to three generations, health-oriented physical activity and self-evaluation of health and physical fitness are conditioned by demographic factors: age, sex, marital status, place of residence, education.

## Subjects

The importance of physical activity in the lifestyle of students, their parents and grandparents has been studied by the authors of this work for several years. This work comprises research conducted between 2013 and 2017 among students connected with physical culture and health promotion, studying in the Department of Physical Culture and Health Promotion at the University of Szczecin and in the Faculty of Physical Culture in Gorzów Wielkopolski—which is a branch of the University School of Physical Education in Poznań—as well as their families (1580 people in total). In the research, purposive sampling was used to determine relationships of health-oriented physical activity and self-evaluation of physical fitness and health among three adjacent generations. The study embraced 400 students (203 of physical education, 123 of tourism and recreation, 74 of public health and physiotherapy). The students were mostly aged 20–25 (95%). Most of the students were female (57.4%). 6% of the respondents were married, and 5.5% were in cohabitation. 44.7% of female students and 62.2% of male students had jobs. Among 1580 respondents, city dwellers accounted for 65%.

The research also included 496 students' parents (265 mothers and 231 fathers) and 684 grandparents (422 grandmothers and 262 grandfathers). Three age categories recognized by WHO experts were distinguished: 45–59 years (pre-old age), 60–74 years (early old age) and 75–89 (old age). The students' parents were mostly aged 45–59 (83.9%) or below that age (13.1%). There were also parents who were over 75 years of age (3%). Grandparents were aged 60–74 (56.9%), over 74 (38.8%), and much less often 45–59 (4.3%). There were almost no cohabitation situations among parents (0.4%). About 84% of mothers and fathers were married, and women more often declared widowhood (7.6% and 0.4% resp.). More than ¼ of the population of men aged 65 and above were in marital relationships, while women in this age group were most often widows. Hence the surveyed grandfathers were more

often married in comparison with the grandmothers (74.7% and 49.2% resp.), and more rarely declared widowhood (18.8%; 45.1%).

The parents of the surveyed students most often had a secondary and higher education (40.3% and 25.2% resp.), and grandparents' education was below secondary and secondary (60.5% and 29.9% resp.). Most parents still worked (72.5% of the mothers and 82.6% of the fathers), 10.4% of the grandmothers and 17.4% of the grandfathers were professionally active.

## Methods

To carry out the research the diagnostic survey method was employed, with the use of the techniques of questionnaire and interview. Information obtained from uncategorized interviews and observations conducted among students supplemented and verified the results of the research. Physical activity was assessed by analyzing participation in physical education classes, practicing sport at a competitive level in the past and currently, engaging in physical recreation in the past and currently, as well as traveling and going on vacations in the last year. The forms of caring for health included: undergoing rehabilitation in the past and currently and sanatorium treatment. In the assessment of health and physical fitness, self-evaluation was used.

The qualitative and quantitative analysis was carried out with the employment of standard statistical methods: frequency of characteristics, chi-square independence test and multiple correspondence analysis<sup>24</sup>. The statistical software package Statistica 12 was used in the analyses [StatSoft, inc. 2016 Statistica for Windows].

## Results

Physical activity and caring for health with respect to the three generations studied are presented in Table 1. Participation in physical education classes in the past was declared by the majority of the respondents (90.6%), slightly more often by female students and by their mothers. The Grandmothers and grandfathers had less frequently participated in physical education classes. Practicing sports at a competitive level in the past was declared by 42.6%, and currently by 8.9% of the respondents. Most male and female students had practiced sports at a competitive level in the past, while their mothers and grandmothers had done it much less often. The fathers and grandfathers had previously practiced sports at a competitive level twice as often as the mothers and grandmothers of the surveyed students. Currently, sports were practiced mainly by male students (41.4%), with the number of female students more than twice as small. Participation in physical recreation in the past was declared by 83.6% of the respondents, and currently by 52.6%, and in both cases this participation was more often reported by male students. The older the generation was, the fewer people declared participation in physical recreation. In the past year, 62.2% of the respon-

dents traveled, and 50.3% went on vacations. Traveling was more often preferred by women (female students, their mothers and grandmothers). A similar situation was observed as far as vacations are concerned, with the differences being more noticeable in the parents. The mothers went on vacations in the previous year more often than the fathers. Caring for health was expressed by undergoing rehabilitation (53.7% in the past; 18.6% in the past year). Female students less frequently underwent rehabilitation treatment in comparison with male students. The number of respondents who needed these procedures increased among grandparents. Currently, the most people underwent rehabilitation in the oldest generation. In the past, 29.6% of the respondents used sanatorium services. This number increased with the respondents' age. As for rehabilitation and stays in sanatoriums, it can be noticed that there was a great demand for rehabilitation in the students' group, however they rarely decided to go for sanatorium treatment or they were not given referrals (Table 1).

All forms of physical activity and caring for health included in Table 1 were associated with the demographic variables (Table 2). Participation in physical education classes, practicing sports at a competitive level and engaging in physical recreation in the past were declared by most students (95%, 90% and 97% resp.). They were also very active currently, both in recreation (about 90%) and sports (over 25% still practiced sports at a competitive level). 85% of the respondents enjoyed vacations and traveling in the past year. From 34.2% to 55% had undergone rehabilitation in the past. Currently around 11% benefited from it. Sanatorium treatment was reported by about 7%.

A similar percentage of the students' parents who were below 60 years of age had participated in physical education classes (95.6%). They had practiced sport at a competitive level less often as compared to their children (34.2%), they less often declared participation in physical recreation in the past (86.4%) and currently (50.5%), and less frequently traveled (68.2%) or went on vacations (58.5%). On the other hand, they had undergone rehabilitation (48%) and sanatorium (19.7%) treatment in the past more often than their studying children; but less often in comparison with people over 60 and 75 years of age.

Fewer people over 60 and 75 declared participation in physical education classes (86.8% and 80.8% resp.), practicing sports at a competitive level in the past (21.8% and 12% resp.), and participation in physical recreation in the past (74.8% and 71.2% resp.) and currently (37.8% and 25% resp.). With age, a decrease was observed in the number of people over 60 and 75 years of age who traveled in the past year (54.3% and 28.4% resp.) and went on vacations (63.1% and 19, 3% resp.). The number of people who declared practicing these forms after 75 years of age was systematically decreasing. The use of rehabilitation services in the past and currently, as well as undergoing sanatorium treatment remained at a similar level in these age groups (about 66%, 25% and 50% resp.).

**TABLE 1.**  
FORMS OF PHYSICAL ACTIVITY AND CARING FOR HEALTH OF THE STUDENTS, THEIR PARENTS AND GRANDPARENTS (INDEPENDENCE X2 TEST)

Forms of physical activity and caring for health	Respondents (n=1580)						Value of p for $\chi^2$ test
	Female students (N=219)	Male students (N=181)	Mothers (N=265)	Fathers (N=231)	Grand-mothers (N=422)	Grand-fathers (N=262)	
Physical Education	97.7	92.3	97.4	93.1	83.6	86.3	0.0000
Competition level sport in the past	97.7	92.3	22.3	47.2	11.2	29.8	0.0000
Competition level sport currently	17.0	41.4	2.3	4.0	-	-	-
Physical recreation in the past	97.7	96.1	87.8	83.9	73.8	73.9	0.0000
Physical recreation currently	87.6	85.6	51.5	52.2	30.5	35.9	0.0000
Traveling in the past year	84.9	80.1	75.8	63.5	46.2	41.3	0.0000
Vacations in the past year	78.4	78.3	63.9	55.7	25.2	28.6	0.0000
Rehabilitation in the past	36.9	50.3	46.4	47.0	67.2	61.9	0.0000
Rehabilitation currently	6.5	9.4	17.6	12.7	28.4	25.5	0.0000
Sanatorium	10.1	5.0	19.9	16.7	51.7	48.5	0.0000

Statistically significant relationships were observed between practicing sport in the past and now, as well as between going to sanatoriums and gender. Women had less often practiced sports in the past (35.5%) and currently (5.6%), but they more often went to sanatoriums (32.1%) (Table 1).

Single respondents and those living in cohabitation had significantly more often participated in physical education classes (94.2% and 100% resp.). They also reported practicing sports at a competitive level in the past (87.9% and 95.8% resp.) and currently (26.1% and 20.8% resp.). They traveled in the last year (80% and 83.3% resp.), went on vacation (75.1% and 75% resp.) and currently participated in physical recreation (84.3% and 70.8% resp.). These individuals also showed greater care for their health by currently undergoing rehabilitation (84.37% and 70.8% resp.). In contrast to this group of subjects, widowed people were characterized by lower activity. They less often declared involvement in competitive level sport in the past and currently (13.1% and 1.6% resp.), had less willingly participated in physical recreation in the past (69.4%) or did it presently (23%), and less frequently reported traveling and going on vacations in the past year (35.8% and 22.6% resp.). In the past, they had undergone rehabilitation treatment as often as the singles and those living in cohabitation (almost 92%). In each case, apart from participation in physical education classes (91.2%) and physical recreation in the past (81.8%), married people were less likely to undertake the forms of physical activity and caring for one's health discussed. Urban residents more often declared practicing sports at a competitive level in the past (46.2%) and currently (10.1%); they presently participated in physical recreation (55.7%), traveled (66.5%) and went on vacations (55.4%).

Individuals with a higher education were characterized by participation in physical education classes (94.6%), practicing competitive level sports in the past and currently (42.7% and 5% resp.), physical recreation in the past

and currently (89.7% and 78.1% resp.), traveling (83.7%), going on vacations (72.3%), and undergoing rehabilitation treatment in the past (63%) and currently (26.9%). Respondents with a pre-secondary education went to sanatoriums more often (40.8%). The students' behaviors were the closest to those of people with a higher education: more than 95% of them had participated in physical education lessons, they had engaged (97%) and still engaged (86.7%) in physical recreation, traveled (83%) and went on vacations in the past year (78.4%). Only practicing sports at a competitive level in the past (95.2%) and currently (28.1%) was much higher among students.

Statistically significant relationships were found between the current professional activity and practicing sport in the past (53.7% and currently (11.4%), physical recreation in the past (88.9%) and currently (52.4%), traveling (74.6%) and going on vacations in the past year (66%). Individuals who did not work, more often reported undergoing rehabilitation in the past (60.7%) and currently (22.6%), and more often benefited from sanatorium treatment (39.9%) (Table 2). The subjects were mostly characterized by medium self-evaluation of physical fitness (Table 3). Female students rated their fitness as medium and high, while male students more often as high. Medium self-evaluation was also indicated by fathers and mothers as well as grandmothers and grandparents. A low level of physical fitness was characteristic of grandparents, especially grandmothers, who had difficulties performing their self-evaluation. Compared with female students and their mothers and grandmothers, male students, their fathers and grandfathers more often rated their physical fitness as high, and less often as low.

The respondents most often assessed their health as good and average. The students' parents and the female students saw their own state of health as good, while the grandparents as average and good. The most very good ratings were among male and female students, the latter having slightly more good evaluations. Among grand-

**TABLE 2.**  
DEMOGRAPHIC CONDITIONS OF INTERGENERATIONAL PHYSICAL ACTIVITY AND CARING FOR HEALTH  
(INDEPENDENCE  $\chi^2$  TEST)

Forms of physical activity and caring for health	Determinants					
	Age	Sex	Marital status	Place of residence	Education	Employment
Physical Education classes	0.000	ns	0.0000	ns	0.0000	ns
Practicing competition level sport in the past	0.0000	0.0000	0.0000	0.0006	0.0000	ns
Practicing competition level sport currently	0.0000	0.0000	0.0000	0.0432	0.0000	0.0045
Physical recreation in the past	0.0000	ns	0.0000	ns	0.0000	ns
Physical recreation currently	0.0000	ns	0.0000	0.0004	0.0000	ns
Traveling (in the past year)	0.0000	ns	0.0000	0.0000	0.0000	0.0000
Vacations (in the past year)	0.0000	ns	0.0000	0.0000	0.0000	0.0000
Rehabilitation in the past	0.0000	ns	0.0000	ns	0.0000	0.0019
Rehabilitation currently	0.0000	ns	ns	ns	0.0000	0.0000
Sanatorium	0.0000	0.0099	0.0000	ns	0.0000	0.0000

\*ns – not significant

mothers and grandfathers there was the greatest number of bad and very bad ratings, as well as difficulties with self-evaluation (Table 3).

The associations between undertaking various forms of physical activity in the past and currently by the subjects representing three generations are comprehensively presented by means of multiple correspondence analysis (Figure 1), in combination with the results of the independence chi-square test (Table 1).

Selected MCA dimensions explained 36.3% of the total value of  $\chi^2$ . The graphical analysis considered two dimensions in space. Relationships between practicing competitive level sport in the past (2a), current participation in physical recreation (4a), traveling (5a) and vacations (6a) in the past year with regard to the female students (FS) and the male students (MS) were confirmed. The fathers (F) and mothers (M) of the surveyed students had participated in physical education classes (1a) and engaged in physical recreation in the past (3a). The mothers less frequently declared practicing sport at a competitive level in

the past (2a) (see Table 1). It was confirmed that the grandfathers (GF) and grandmothers (GM) had to a lesser degree participated in physical education classes (1b), did not practice competitive level sport in the past (2b), less often declared physical recreation in the past (3a), and currently (4b), did not travel (5b) and did not go on vacation (6b) in the past year (Figure 1).

The relationships between self-evaluation of physical fitness and health and caring for health with regard to three generations are shown in Figure 2.

Selected MCA dimensions explained 32.85% of the total value of  $\chi^2$ . It was confirmed (see Table 3) that the male students (MS) and the female students (FS) had high self-evaluation of physical fitness (PF1), and very good and good self-evaluation of health (H1). The mothers (M) and fathers (F) were characterized by medium self-evaluation of physical fitness (PF2) and health (H2), and less frequent rehabilitation treatment in the past (1b) and currently (2b), and sanatorium treatment (3b) (see Table 1 and Table 3). The grandfathers (GF) and grandmothers

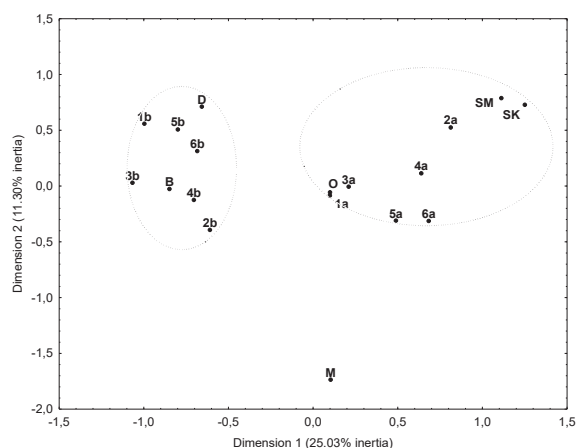


Fig. 1. Intergenerational relations concerning different forms of physical recreation and rest (MCA).

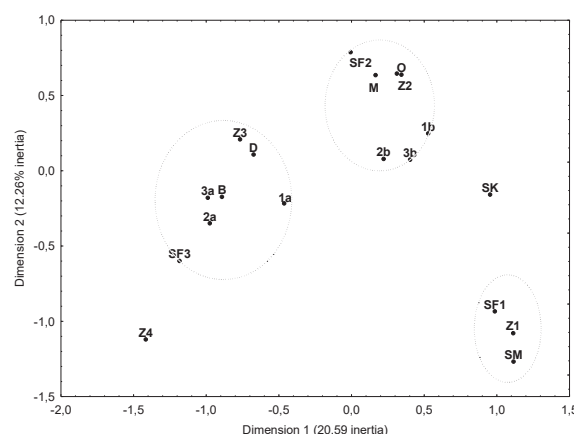


Fig. 2. Relations between students, parents and grandparents' physical fitness and health self-evaluation and their caring for health (MCA).

**TABLE 3.**  
PHYSICAL FITNESS AND HEALTH SELF-EVALUATED BY THREE GENERATIONS (INDEPENDENCE X2 TEST)

Self-evaluation	Respondents						Total (n)
	Female student	Male student	Mother	Father	Grand-mother	Grand-father	
Physical fitness*							
High	50.7	76.2	17.7	27.7	7.6	11.8	423
Medium	45.2	22.2	63.4	58.4	45.8	51.2	769
Low	3.2	0.5	16.6	12.2	42.3	34.7	349
I do not know	0.9	1.1	2.3	1.7	4.3	2.3	38
Health							
Very good	43.8	52.8	19.7	18.3	4.3	4.6	315
Good	49.8	39.5	47.0	53.9	29.1	34.0	639
Average	5.9	6.1	27.3	22.6	46.5	45.0	461
Bad	0.5	1.2	5.3	5.2	19.1	15.6	121
Very bad	0.0	0.6	0.7	1.7	3.1	3.4	29
I do not know	0.0	0.6	0.7	0.0	0.9	0.8	9

\*statistical significance for the  $\chi^2$  test at the level of  $p \leq 0.001$

(GM) who assessed their physical fitness level as low (PF3) and their health as bad and very bad (H3), declared having rehabilitation procedures in the past (1a) and currently (2a), as well as sanatorium treatment (3a). Indi-

viduals who were not able to evaluate their health (H4) had a peripheral position (Figure 2). The mothers (M) and fathers (F) under the age of 45 (1a) and aged 45–59 (1b), with a secondary (2b) or higher education (2c), being married or cohabiting (3b) or divorced (3d), assessed their physical fitness as an medium (PS2). A separate group was formed by people currently participating in recreation (PR1), with high self-evaluation of physical fitness (PF1), and very good, good (H1) and average (H2) self-evaluation of health. Close to this group were students (2s), (FS and MS), aged 20–25, mostly single (3a).

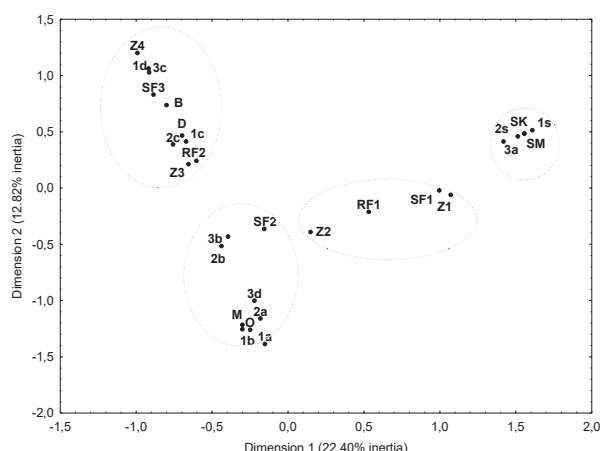


Fig. 3. Relations between respondents' physical fitness and health self-evaluation and their current participation in physical recreation, in the context of demographic conditions (MCA).

viduals who were not able to evaluate their health (H4) had a peripheral position (Figure 2).

The demographic conditions between the respondents' self-evaluation of physical fitness and health and their current participation in physical recreation are shown in Figure 3.

Selected MCA dimensions explained 35.22% of the total value of  $\chi^2$  (Figure 3). The graphical analysis presents the self-evaluation of physical fitness and health, and the following characteristics are distinguished: current participation in physical recreation or lack of it (PR1 – yes, PR2 – no), age categories (1a: below 45 years of age; 1b:

## Discussion

The results of this research indicate that physical activity and manifestations of caring for health occurred in similar proportions in the generations of students, parents and grandparents. The older the generation, the smaller is the number of those physically active in the past and currently. The students more often reported engaging in physical recreation in the past and currently as compared to the generations of parents and grandparents. Only the number of individuals who declared undergoing rehabilitation treatment in the past and currently and going to sanatoriums showed a reverse tendency. Results obtained in our own research into the relationships between parents and offspring were confirmed by analyses of physical activity of 4661 Portuguese nuclear families. In the case of leisure activity and sports activity, the activity patterns showed higher cor-

relations between spouses than between parents and children. Relationships between fathers and mothers with respect to engaging in quantitatively and qualitatively similar forms of physical activity also indicate common, similar habits<sup>19</sup>.

Most students had practiced sports at a competitive level in the past, while their mothers and grandmothers had done it much less often. In comparison with the mothers and grandmothers of the students studied, the fathers and grandfathers had taken up competitive level sport twice as often. The difference in interest in sport between generations and sexes still persisted. These results confirm women's lower interest in practicing competitive level sport. It concerns both young women (female students), and their mothers and grandmothers. On the other hand, traveling and vacations were more often preferred by women (female students, their mothers and grandmothers)<sup>25</sup>.

The hypothesis was confirmed that behaviors related to physical activity and caring for health displayed by female students are similar to the behaviors of their mothers and grandmothers, just like male students' behaviors become similar to the behaviors of their fathers and grandparents. Behaviors related to physical activity and caring for health are more similar within one generation (male student – female student, mother – father, grandmother – grandfather) than between generations. The forms of physical activity undertaken by the parents and grandparents are more similar within one generation, but they are not transmitted quantitatively to the offspring (in the case of grandparents to the generation of parents, in the case of parents to the generation of their offspring – students). Students of physical education and public health display a higher level of physical activity in comparison with their parents and grandparents as a result of, for example, higher awareness and greater interest in sport. However, high health awareness is not always reflected in physical activity. Medical students, despite higher than average knowledge of health-related importance of physical activity, do not put that knowledge into everyday life practice. Over 70% of those students did not practice any sports discipline in an organized manner. A significant percentage of the students (42.5%) declared a low level of physical activity, and 30.7% of them took physical exercise 2–3 times a week<sup>26</sup>.

Self-evaluations of health and physical fitness were not only conditioned by belonging to a given generation, but also depended on gender. It was found that men had higher self-evaluations. Also, an analysis of this indicator in subsequent generations pointed to their associations in the generations of students, parents and grandparents. In comparison with the female students and their mothers and grandmothers, male students, their fathers and grandfathers more often rated their physical fitness as high, and less often as low. A study of a group of 4813 seniors in Poland showed that among barriers limiting physical activity, women more often than men indicated poor health<sup>27</sup>. Poor health accounted for 25% of the reasons for not doing exercise<sup>28</sup>. A Central Statistical

Office (GUS) survey<sup>23</sup>, concerning the subjective assessment of Polish people's own health, shows constant improvement in the health condition of adult Poles, including individuals aged 65 and above. In the period between 2005 and 2012, the percentage of elderly people who assessed their health as bad or very bad decreased by 10%, however, it is still very high. The GUS research showed that only one in eight elderly people in Poland (13%) evaluated their health as at least good. Another 45% saw their health as fair (neither good nor bad), and the remaining 42% assessed it as bad or very bad (in 2005 such assessments accounted for over 50%)<sup>23</sup>. In the light of the results of this research, about 20% of the elderly (grandmothers and grandfathers) were found to have bad and very bad health self-evaluations. Compared to men, women were more skeptical about their health, and this relationship was observed in all the age groups, not just among the elderly. The self-evaluated level of health decreased with age, but remained higher in the case of engaging in physical activity<sup>22, 29</sup>. Despite the lowest percentage of physical active individuals in the generation of grandfathers and grandmothers, these respondents did declare participation in recreation in the past (over 70%), as well as currently (over 30%).

In the light of our own research, over 70% of grandparents, 80% of parents and over 95% of students had engaged in physical recreation in the past. Currently, more than 30% of grandparents, 50% of parents and 85% of students participated in physical recreation. Numerous studies have confirmed the decline in physical activity with growing age, both among women and men. This trend is noticeable around the world<sup>30</sup>. A younger age, a higher level of education and better evaluation of one's own material situation, mean a higher percentage of respondents practicing sport<sup>31</sup>. Among the respondents aged 18–44, having at least a secondary education and being satisfied with the material conditions of their households, the proportion of people practicing sports was higher than the average. There is also a noticeable correlation between physical activity and the place of residence and gender: sport is more common among city dwellers than in rural areas (72% vs 56%), and a little more often practiced by men than by women (69% vs 63%). Practicing sports during the past year was most often declared by schoolchildren and higher education students (95%), for whom physical education classes were compulsory, as well as by managers and specialists with a higher education (87%)<sup>32</sup>.

It would seem that older people, due to the largest amount of free time available in comparison with other social groups, have a significant potential for tourism and recreational activity. However, due to their age and other limitations they often do not engage in them. In the life cycle phase model and the corresponding consumer behaviors<sup>33</sup>, the loneliness syndrome is often assigned to older people. Becoming a widow or a widower in retirement means a very significant decline in income, which determines lower participation in tourism. Such people's trips usually take the form of low-budget trips to rela-

tives and friends or trips to sanatoriums for health-related reasons. This fact is confirmed by individuals over 65 years of age dominating in short-term trips when it comes to trips to family and friends (52.0%). Other, more frequently occurring forms of short-term trips were vacations (31%) and going to allotment gardens (about 10%). In comparison with European societies, Poles aged over 65 have a significantly lower level of tourist attendance<sup>34</sup>. A difficult situation of widowed people was observed in our own research as well. Married individuals also less frequently undertook the discussed forms of physical activity and caring for health. The reason for this lower activity might be the lack of time and fatigue resulting from numerous professional and family duties<sup>2,23</sup>.

In our own research, the hypothesis was confirmed by showing statistically significant relationships between current professional activity and both physical activity and caring for health. The respondents who did not work, more often reported receiving rehabilitation treatment in the past and currently, as well as going to sanatoriums. Work activates people and facilitates the improvement of their well-being, but it can also be destructive in the case of lack of satisfaction. According to research<sup>35</sup>, health varied significantly depending on the respondents' job situation. The best self-evaluated health at the about-retirement age was reported by working people, about 70% of whom described it as good or very good. Employees and recipients of benefits evaluated their health similarly (about 48%). Considering the homogeneous group of pensioners, it should be noted that those of them who worked were on average healthier than those who did not. The difference for men was significantly greater than it was for women. In the opinion of 7% of Poles and 14% of Europeans, poor health can not only make it difficult but also impossible to start or continue working<sup>35</sup>. When asked about the main factors motivating them to continue working beyond retirement age, the respondents mentioned: financial issues (25% of the respondents), valuable and meaningful occupation (22%), and maintenance of physical activity (21%). Deactivation changes their situation, deprives them of professional contacts, and therefore, to a large extent, forces a change of behaviors and habits, which in turn reduces their satisfaction with life after retirement<sup>36,37</sup>.

Retirement involves a significant drop in income and a decline in the sense of satisfaction with life, often with deterioration of physical fitness and health<sup>36</sup>. The GUS<sup>23</sup> research showed that in the elderly population women are in the majority: there are 160 of them per 100 men (the feminization rate for the entire Polish population is 107). The increasing with age proportion of women in the population is a consequence of the excess mortality of men and the diversification of life expectancy: women reaching the age of 65 have almost five years more of life ahead of them than men. The percentage of widowed persons is 3.5 times higher among women than among the equivalent male population. Married women at this age constitute 34%. Therefore, for men old age mostly means living

with another person, whereas for women it is most often loneliness.

The research confirmed the hypothesis that urban residents, people with a higher education, were more often characterized by practicing sport at a competitive level in the past and presently, more willingly participated in physical recreation and traveled. Persons with a pre-secondary education were more likely to go to sanatoriums. The less educated and non-working people sought to improve their health in therapeutic rather than prophylactic activities (physical activity). This is due to the fact that large differences still exist in the levels of education between people living in cities and those dwelling in rural areas. In the perspective of 20 years, one can expect a reduction of the differences both due to the intensive education of people living in the country, and because of the migration of people at the immobile productive age with a secondary and higher education from large cities to their outskirts<sup>13</sup>.

In conclusion, intergenerational differences in preferences regarding physical activity, forms of rest and caring for health were confirmed. The observed similar percentages of physical activity undertaken by the students, their parents and grandparents, proved that certain behaviors were analogous in the three generations and characteristic of them. Those who studied physical education and public health displayed a higher level of physical activity compared to their parents and grandparents. The analyzed behaviors were more similar within one generation (male student – female student, mother – father, grandmother – grandfather) than between adjacent generations. Moreover, it was shown that intergenerational transmission of patterns of physical activity also occurred within the sexes. The female students, mothers and grandmothers were less physically active than the male students, fathers and grandfathers. The female students' behaviors regarding physical activity and caring for health were similar to the behaviors of their mothers and grandmothers, in the same way as the behaviors of male students became similar to their fathers and grandfathers' behaviors. Likewise, self-evaluation of physical fitness and health was subject to intergenerational and gender differentiation. Higher self-evaluation of physical fitness and health was characteristic of the younger generations, those physically active in the past and currently, and men. Lower self-evaluation was characteristic of the older generations and women.

It was confirmed that the respondents' health-oriented physical activity, caring for health and self-evaluation of physical fitness and health were conditioned by age, sex, marital status, place of residence and education. The differences in physical activity and caring for health in the three generations analyzed have a manifold background. In the Polish school system, too little attention is devoted to the implementation of systematic physical activity, education in the field of whole life sports, as well as shaping the patterns of family behavior, leading to health-oriented physical activity and active forms of rec-



reation. Research into the intergenerational transmission of patterns of physical activity and caring for health is of great importance in the prevention of health in Polish society. The intention of the authors is to continue research in order to determine a more accurate transfer of physical activity and caring for health in family in relation to gender. It would also be important to examine the physical activity of parents and grandparents in comparison with their offspring who did not choose to study physical education.

## REFERENCES

1. KRUK, J. (2009). Physical activity and health. *Asian Pacific J Cancer Prev* 10(5), 721–728. — 2. NOWAK, M. (2008). Aktywność fizyczna w prozdrowotnym stylu życia kobiet. (AWF, Poznań, 2008). — 3. LUBKOWSKA, W. SZARK-ECKARDT M. JUSZCZYK, A. ZAJĄC, M. STĘPIEŃ-SŁODKOWSKA, M. MROCZEK, B. CHINMAY, P. (2009). Assessment of impact of the computer work station on the risk of musculoskeletal system diseases in banking sector employees. *Lase Journal of Sport Science* 7(2), 93–106. — 4. KOTARSKA, K. WUNSCH, E. RASZEJA-WYSZOMIRSKA, J. KEMPIŃSKA-PODHORODECKA, A. WÓJCICKI, M. MILKIEWICZ, P. (2015). Leisure time physical activity and health-related behaviours after liver transplantation: a prospective, single centre study. *Gastroenterology Review* 2, 1–5. — 5. KOTARSKA, K. NOWAK, M., A. (2017). Health self-assessment in presently and previously physically active people aged 45–89 years. *Polish Journal of Sport and Tourism* 24, 178–19. — 6. COOPER, A., R. SEBIRE, S. MONTGOMERY, A., A. PETERS, T., J. SHARP, D., J. JACKSON, N. FITZSIMONS, K. DAYAN, C. ANDREWS, R. C. (2012). Sedentary time, breaks in sedentary time and metabolic variables in people with newly diagnosed type 2 diabetes. *Journal of Diabetology* 55 (3), 589–599. — 7. CHUDECKA, M. LUBKOWSKA, A. KEMPIŃSKA-PODHORODECKA, A. (2014). Body surface temperature distribution in relation to body composition in obese women. *Journal of Thermal Biology* 43, 1–6. — 8. SYGIT, K. (2018). Health problems of seniors: selected diseases of the old age. *Health probl Civil* 12 (1), 33–40. — 9. KUSKA, M. (2018). The Importance of Physical Activity in the Process of Successful Ageing – An Overview. *CEJSM* 1 (21), 55–65. — 10. KRUK, J. (2014). Health and Economic Costs of Physical Inactivity. *Asian Pacific Journal of Cancer Prevention* 15 (18), 7499–7503. — Poziom aktywności fizycznej Polaków w 2017. (Ministerstwo Sportu i Turystyki, Kantar Public, listopad 2017). — 11. MOGIŁA-LISOWSKA, J. KORYCKI, Ł.: Rodzina wiejska – środowisko rekreacji ruchowej. (Rozprawy Naukowe, AWF Wrocław, 2017). — 12. SULIMA, R. (2014). Społeczne przeobrażenia wsi na przełomie XX i XXI wieku. *Więś i Rolnictwo* 2 (163), 17–29. — 13. BERNAT, E. (2011). Sport and other motor activities of Warsaw students. *Biom. Hum. Kinet* 3, 10–13. — 13. Mead, M. *Kultura i tożsamość. Studium dystansu międzypokole-niowego.* (PWN, Warszawa, 2000). — 14. CZAPIŃSKI, J. PANEK, T.: *Diagnoza Społeczna 2015. Warunki życia i jakość życia Polaków.* (Raport. Rada Monitoringu Społecznego, Warszawa 2015). — 15. NOWAK, M., A. NOWAK, L. (2013). Socio-demographic conditions of the realization of health-oriented lifestyles by women. *Archives of Budo* 9(1), 29–37. — 16. KAY, T. (2000). Sporting excellence: a family affair? *European Physical Education Review* 6, 151–169. — 17. MAIA, J. GOME, T., N. TRÉGOUËT, D.-A. KATZMARZYK, P., T. (2014). Familial resemblance of physical activity levels in the Portuguese population. *J Sci Med. Sport.* 17, 381–386. — 18. WUERTH, S. LEE, M., J. ALFERMANN D. (2004). Parental involvement and athletes' career in youth sport. *Psychology of Sport and Exercise* 5, 21–33. — 19. Rola dziadków w naszym życiu. Centrum badania opinii społecznej Komuni-
- kat Badań Warszawa wrzesień 2012. (CBOS, 2012) — 20. Co zawdzięczamy swoim babciom i dziadkom? Centrum badania opinii społecznej Komunikat Badań Warszawa wrzesień 2011. (CBOS, 2011). — 21. Sytuacja demograficzna osób starszych i konsekwencje starzenia się ludności Polski w świetle prognozy na lata 2014–2050. Opracowanie przygotowane w Departamencie Badań Demograficznych i Rynku Pracy z udziałem Departamentu Badań Społecznych i Warunków Życia. (Warszawa, GUS, 2014). — 22. VAN BUUREN, J. DE LEEUW, J., V. (1992). Equality Constraints in Multiple Correspondence Analysis. *Multivar. Behav. Res* 27 (4), 567–583. — 23. GÓRNA, J. (2015). Preferencje i aktywność turystyczna Polaków w wieku 50+. *Kultura Fizyczna* 15(1), 153–166. — 24. ŁASZEK, M. NOWACKA, E. GAWRON-SKARBEBEK, A. SZATKO, F. (2011). Negative behavior patterns of students. Part II. Physical activity and eating habits. *Probl Hig Epidemiol* 92(3), 461–465. — 25. MOSSAKOWSKA, M. WIĘCEK, A. BŁĘDOWSKI, P.: *Aspekty medyczne, psychologiczne, socjologiczne i ekonomiczne starzenia się ludzi w Polsce.* (Raport z badań realizowanych w ramach projektu PolSenior, koordynator MIBMiK, Warszawa, 2012). — 26. BERNAT, E. BUCHHOLTZ, S. (2017). Poor health and contraindications – the most common barriers to physical activity in Poles aged 50+. *Health Problems of Civilization* 11(3):135–141. — 27. OPDENACKER, J. DELECLUSE, C. BOEN, F. (2009). The longitudinal effects of a lifestyle physical activity intervention on physical self-perceptions and self-esteem in older adults. *Journal of Sport and Exercise Psychology* 31, 743–760. — 28. HAM, S., A. YORE, M., M. FULTON, J., E. KOHL, H., W. (2004). Prevalence of no leisure-time physical activity – 35 states and District of Columbia. *Morbidity and Mortality Weekly Reports.* 51(4), 82–86. — 29. BIEŃ, A. RZOŃCA, E. KRYSA, J. IWANOWICZ-PALUS, G. TURKOSZ, A. (2016) Socjodemograficzne uwarunkowania zachowań zdrowotnych kobiet w okresie prokreacji. *Med Og Nauk Zd* 22 (3), 210–215. — 30. Aktywność fizyczna Polaków. Centrum badania opinii społecznej Komunikat Badań Warszawa wrzesień 2013. (CBOS, 2013). — 31. ALEJZIAK, W.: *Determinanty i zróżnicowanie społeczne aktywności turystycznej.* (Studia i Monografie AWF, Kraków, 2009). — 32. PARZYCH, K. GOTOWSKI, R. (2016). Selected indicators of the seniors tourist activity in Poland and in other European countries. *Journal of Education, Health and Sport.* 26(10), 680–698. — 33. Dezaktywizacja osób w wieku około-emerytalnym. Raport z badań, Departament Analiz Ekonomicznych i Prognoz. (Ministerstwo Pracy i Polityki Społecznej, Warszawa, 2008) — 34. BEENACKERS, A. KAMPHUIS, C., B. GISKES, K. BRUG, J. KUNST, A. E. BURDORF, A. VAN LENTHE, F., J. (2012) Socioeconomic inequalities in occupational, leisure-time, and transport related physical activity among European adults: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity* 29, 116–120. — 35. BALANDYNOWICZ-PANFIL, K.: *Znaczenie aktywności zawodowej dla jakości życia osób starszych.* W: KALUŻA D, SZUKALSKI P. (red.): *Jakość życia seniorów w XXI wieku: ku aktywności.* (Wydawnictwo Biblioteka, Łódź, 2011)

## Acknowledgements

The research was carried out thanks to the involvement of students from the Department of Physical Culture and Health Promotion at the University of Szczecin and the Faculty of Physical Culture in Gorzow Wielkopolski – a branch of the University School of Physical Education in Poznan. We would like to thank the students, their parents and grandparents who devoted their valuable time to participate in the research.

*M. A. Nowak,*

*Al. Piastów 40B, bud.6, 71-065 Szczecin, Poland*

*e-mail: maria-nowak@wp.pl*

## **TJELESNA AKTIVNOST, ZDRAVLJE I TJELESNA KONDICIJA STUDENATA, NJIHOVIH RODITELJA, BAKA I DJEDOVA**

### **SAŽETAK**

Cilj rada je usporedba prakticanja fizičkih aktivnosti, brige o vlastitom zdravlju i procjene zdravlja i tjelesne kondicije u tri generacije ispitanika. Istraživanje provedeno u razdoblju od 2013. do 2017. godine obuhvatilo je ukupno 1580 ispitanika, od toga 400 studenata aktivnih u fizičkim aktivnostima i promociji zdravog života, njihovih 496 roditelja i 684 djedova i baka. Podaci su prikupljeni dijagnostičkom anketom uz pomoć upitnika, intervjua i opažanja i podvrgnuti standardnim statističkim analizama. Rezultati za fizičke aktivnosti, brigu o vlastitom zdravlju i procjenu zdravlja i tjelesne kondicije su bili sličniji unutar jedne generacije (student vs. studentica, majka vs. otac, baka vs. djed) nego između susjednih generacija (studenti vs. roditelji, roditelji vs. djedovi i bake). Unutar istog spola, rezultati studentica su bili slični onima njihovih majki i baka, a rezultati studenata onima njihovih očeva i djedova. Fizička aktivnost, briga o zdravlju i samoprocjena zdravlja i tjelesne kondicije povezani su s dobi, spolom, bračnim statusom, mjestom stanovanja i obrazovanjem.