

## LIFESTYLE AND PHYSICAL FITNESS IN EARLY SCHOOL-AGE CHILDREN

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**Annotation.** *Aim of the study:* the aim of the study was determining relation between selected health behaviour aspects and level of physical fitness in 1<sup>st</sup> – 3<sup>rd</sup> grade pupils at primary school in Malbork (Pomorskie province). *Materials and Methods:* the research was conducted in 2009 among 153 children aged 7-10 years. The research group consisted of 80 girls and 73 boys. The diagnostic survey method with use of a questionnaire technique and a set of indirect motor trials was applied. *Results:* the research has shown that the health behaviours of young Polish children do not differ from their peers in other countries. The largest percentage of early school-age children in Malbork achieved the average level of physical fitness (57.0%), while the percentage of students with low (22.0%) and high (21.0%) level was similar. *Conclusions:* the connection between pro-health attitudes of early school-age children (i.e., leisure activities, own health condition, nutrition and the use of drugs) and the level of their physical fitness was not ascertained.

**Keywords:** pupils, early school age, health behaviour, physical fitness.

### Introduction

The issues concerning threats to public health are vital and as a consequence they have become a world-wide discussed phenomenon (Salmond et al., 1994; Francis, 1999). Findings of presented dissertations emphasize the importance and purposefulness of pro-health education in a broad sense. These results based on facts clearly evidence the unsatisfactory and constantly deteriorating health conditions of the majority of human population. (Méeszáros et al., 2008; Starosta, 2010). This undesirable occurrence has particularly intensified in highly developed countries (Hollar et al., 2010). As the research shows, man is not capable of achieving an optimal quality of life as well as happiness, without a psychophysical health in general (Puchalski, 2005). In a group of basic health conditioning, such health measures as: leisure activities, proper nutrition, the use of drugs as well as knowledge and opinion about own health condition have been indicated for many years as essential health factors (Breslow, 2001). Hence, the Canadian Minister of Health claims, these factors, which are directly responsible for lifestyle, seriously affect human health (from 50% up to 60%) (Hancock, 1986). All of the unwanted habits connected with improper lifestyle result in both, unfavorable consequences of human health and the causes of the vast majority of lifestyle diseases (Duvigneaud et al., 2007; Bolton & Rodriguez, 2009).

The above-presented arguments indicate the need of deeper analysis of health behavior from the early childhood, for instance among early school-age children, learning and growing up in small towns (up to 30 thousand citizens) in Pomorskie province. Moreover, the study concentrated mostly on certain community, gives a possibility of deeper analysis, among others based on socio-economic conditions that govern this area.

This dissertation accounts for the continuation of the research which is related to association between health posture and the level of physical fitness of early school-age children attending selected primary schools in Pomorskie province. The first part of the observations conducted at the Primary School No. 2 in Malbork was mostly devoted to the relationship between the level of physical fitness in children and their declared physical activity either within school programme or outside school (Podstawski & Borowska 2011). In present article, the attention has been given to aspects of lifestyle of children aged 7-10, which should have a visible connection with the level of physical fitness among those being examined.

### Aim of the study

The aim of the study was determining relation between some health behavior aspects on the basis of the opinion of 1<sup>st</sup> – 3<sup>rd</sup> grade pupils at the Primary School No. 2 in Malbork and their level of physical fitness. The attempt to answer the following questions has become the way to realize previously stated aim of study:

1. What is the physical fitness in 1<sup>st</sup> – 3<sup>rd</sup> grade pupils?
2. Does the level of physical fitness in 1<sup>st</sup> – 3<sup>rd</sup> grade pupils is significantly correlated with their opinions on the ways of spending free time, own health conditions, the way of nutrition and using drugs?

### Material and methods

The research was conducted in 2009 among 153 children aged 7-10 years at The Ignacy Krasicki Primary School No. 2 in Malbork. The research group consisted of 80 girls and 73 boys. Every child attending this school took part in the research. The participation of the subjects of the survey (%), their age (class) and sex is shown in figure 1.

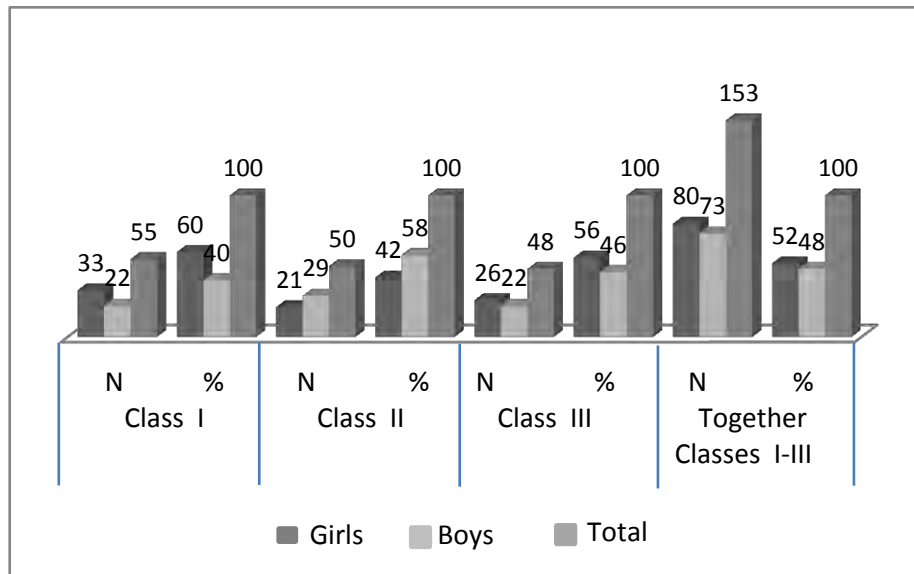


Figure 1. Proportional participation of the subjects including class and sex

In present research the diagnostic survey method with the use of a questionnaire technique and a set of indirect motor trials was applied. The tool used in the physical fitness tests was the set of 11 motor tests. However, the interviewer questionnaire served as a tool to assess children's health behaviors. The assessment of physical fitness level was conducted by means of the criteria suggested by J. Szopa (1998). The following motor tests were applied: „standing broad jump [cm]“, „sit ups – 30 s [number of sit ups]“, „4x10m shuttle run [s]“, „a-skip with hand clap – 8 s [number of hand claps]“, „1 nad 3 min. Burpee test [number of squats in a row]“, „downward bend from standing position[cm]“, „sit and reach [cm]“, „backward medicine ball throw [cm]“, „forward medicine ball throw [cm]“ and „bend arm hang [s]“. All of the applied motor tests are scientifically accurate and reliable (Pilicz, 1997; Szopa et al., 1998; Osiński, 2003). Each child was instructed how to perform the motor tests properly. What is more, every subject of the survey practiced the technique of previously acknowledged tests, depending on the needs in required time during the lesson preceding the assessment. Prior to the test the children took part in a 10-minute warm up.

*Estimation in statistics*

The results of the research were prepared by means of Statistica PL v. 10 computer program, with the use of graphic statistics. In order to estimate the level of physical fitness in a child, each child's points were added and all the results obtained in the motor tests were divided into 3 groups excluding gender division (results below average, average and above average) with the use of  $\chi^2$ .

**Results**

Table 1 shows the average score of children in the individual motor tests.

Table 1

*The level of physical fitness among the early school-age children in the individual motor tests including the subjects' gender*

Motor test	Sex	Results		
		$\bar{X}$	s	V(%)
Standing long jump [cm]	Girls	97.5	25.83	26.49
	Boys	103.0	21.73	21.10
Sit ups - 30s [number of sit ups]	Girls	14.5	6.53	45.03
	Boys	15.5	5.43	35.03
4x10 m shuttle run [s]	Girls	11.2	2.16	19.29
	Boys	11.3	1.56	13.81
Skipping with clapping of hands - 8 s [number of claps]	Girls	16.7	3.93	23.53
	Boys	18.1	4.00	22.10
Downward bend from standing position [cm]	Girls	4.0	4.53	113.25
	Boys	-0.8	5.90	737.50
Sit and reach [cm]	Girls	2.6	5.23	201.15
	Boys	0.7	5.93	741.25
Medicine ball 2 kg backward throw [cm]	Girls	192.7	71.23	36.96
	Boys	222.8	54.03	24.25
Medicine ball 2 kg forward throw [cm]	Girls	192.2	57.36	29.84

	Boys	250.7	53.70	20.89
Bend arm hang on bar [s]	Girls	5.1	3.13	61.37
	Boys	5.7	4.93	86.49
1 min. Burpee test [number of cycles]	Girls	21.7	3.13	14.42
	Boys	22.2	3.93	17.70
3 min. Burpee test [number of cycles]	Girls	46.6	2.91	6.24
	Boys	46.9	3.95	8.42

**Table key:**  $\bar{X}$  - arithmetic mean, s- standard deviation, V- variation coefficient

In Table 1 the variety of physical fitness level among boys and girls is observed, namely the boys achieved better results in most of the performed exercises. The only exception included flexibility exercises such as: „downward bend from standing position“ as well as „sit and reach“ trials in which the girls achieved better results. It has been claimed that the majority of pupils in the 1<sup>st</sup> – 3<sup>rd</sup> grade can be classified to a group of average physical fitness level (57%), however the percentage of pupils with the high (22%) and the low (21%) level was similar (Tab. 1).

The questionnaire answers provided by the pupils were correlated with the pupils' physical fitness level. The results were based on the whole population of the subjects, excluding gender division because in early childhood sexual dimorphism is not as clearly showed as in later development ages. Moreover, partition of the studied children into two groups would result in reduction of external categories numbers what, successively, would negatively influence results reliability and possibility to achieve statistically significant differences. For all the analyzed relationships probability p of exceeding the calculated value of chi-square statistics amounted to < 0.05 confirming significant differences.

Table 2

*Physical activity of children in free time and their physical fitness*

Questions	Answers	Total		Physical fitness					
				Low level		Average level		High level	
		N	%	N	%	N	%	N	%
Spending time off school outdoors	Daily	115	75.2	27	23.5	67	58.3	21	18.3
	2-3 times a week	25	16.3	5	20.0	13	52.0	7	28.0
	Seldom	6	3.9	0	0.0	5	83.3	1	16.7
	Never	2	1.3	0	0.0	1	50.0	1	50.0
	Other answers	5	3.3	2	40.0	1	20.0	2	40.0
What do you do outside in your free time?	I do cycling	97	63.4	23	23.7	50	51.5	24	24.7
	I play different games	52	34.0	13	25.0	32	61.5	7	13.5
	I go for walks	34	22.2	8	23.5	18	52.9	8	23.5
	I play hopscotch	24	15.7	4	16.7	16	66.7	4	16.7
	I play jump rope	27	17.6	4	14.8	19	70.4	4	14.8
	I do jogging	61	39.9	12	19.7	39	63.9	10	16.4
	Other	15	9.8	4	26.7	9	60.0	2	13.3
Playmates during free time	Classmates	71	46.4	17	23.9	43	60.6	12	16.9
	Friends from the neighbourhood	88	57.5	23	26.1	45	51.1	20	22.7
	Parents	22	14.4	3	13.6	18	81.8	1	4.5
	Siblings	59	38.6	12	20.3	34	57.6	13	22.0
	Other persons	13	8.5	3	23.0	7	53.8	3	23.0
How do you prefer spending your free time?	Television and video	33	21.6	5	15.1	23	69.7	5	15.1
	Computer games	63	41.2	14	22.2	35	55.5	14	22.2
	Reading, for example, books	24	15.7	6	25.0	12	50.0	6	25.0
	Painting, drawing	56	36.6	15	26.8	32	57.1	9	16.1
	Walks	40	26.1	10	25.0	22	55.0	8	20.0
	Outdoor activities	103	67.3	28	27.2	54	52.4	21	20.4
	Other ways	8	5.2	1	12.5	5	62.5	2	25.0

As for the results between the opinions of pupils on leisure activities and their level of motor skills, a vast majority of children (75.2%) spent their spare time outdoors, but many fewer declared that they stayed outside 2-3 times a week (16.3%). A small percentage accounted for children staying rarely (3.9%) or never (1.3%) outdoors. Children spending time in the backyard most of all liked cycling (63.4%), running (39.9%) or playing different games (34.0%). Playing a jump rope (17.6%) and playing hopscotch (15.7%) were ranked as the most popular games by the subjects. The group of playmates on fresh air included mostly friends from the neighborhood (57.5%) or classmates (46.4%) and siblings (38.6%). Parents accounted for only 14.4% of persons spending time with their children outdoors. The fourth question was the verification of the declaration previously submitted by the respondents. The answers to the question on how the children like to spend their free time most have confirmed the opinions that *'playing different games outdoors'* (67.3%). Popular leisure activities included also: computer games (41.2%), painting and drawing (36.6%) and walking (26.1%). In the vast majority of the answers analyzed, the children with an average level of physical fitness comprised the biggest percentage (Table 2).

Table 3

*Own health condition assessment and physical fitness in children*

Questions	Answers	Total		Physical fitness					
				Low level		Average level		High level	
		N	%	N	%	N	%	N	%
<b>Are you a healthy child?</b>	Yes	<b>128</b>	<b>83.7</b>	27	21.1	72	56.3	27	21.7
	No	<b>5</b>	<b>3.3</b>	0	0.0	4	80.0	1	20.0
	I do not know	<b>20</b>	<b>13.1</b>	7	35.0	11	55.0	4	20.0
<b>Have you suffered before?</b>	Yes	<b>13</b>	<b>8.5</b>	4	30.8	6	46.2	3	23.1
	Yes but I do not know from what	<b>85</b>	<b>55.5</b>	19	22.4	46	54.1	20	23.5
	No	<b>55</b>	<b>35.9</b>	11	20.0	35	63.6	9	16.4

The vast majority of children considered themselves to be healthy (83.7%), while 20.0% of the respondents were unable to determine the status of their health. Only 5.0% of the children said they did not feel healthy. More than half of the children (55.5%) said they had suffered before, but did not know from what, and 39.9% did not suffer at all. The vast majority of the respondents in each question categories was characterized by an average level of physical fitness (Table 3).

Table 4

*Nutrition and physical fitness in children*

Questions	Answers	Total		Physical fitness					
				Low level		Average level		High level	
		N	%	N	%	N	%	N	%
<b>Do you have breakfast at home?</b>	Yes	<b>108</b>	<b>70.6</b>	26	24.1	58	53.7	24	22.2
	No	<b>45</b>	<b>29.4</b>	8	17.8	29	64.4	8	17.8
<b>What do you eat when you are in school?</b>	Second breakfast brought from home	<b>119</b>	<b>77.8</b>	31	26.0	66	55.5	22	18.5
	Lunch at a school canteen	<b>31</b>	<b>20.3</b>	3	9.7	18	58.1	10	32.3
	Food bought in a shop	<b>11</b>	<b>7.2</b>	3	27.3	6	54.6	2	18.2
	Food bought in a school shop	<b>27</b>	<b>17.6</b>	6	22.2	17	63.0	4	14.8
	I do not eat anything	<b>5</b>	<b>3.3</b>	1	20.0	3	60.0	1	20.0
	Other answers	<b>3</b>	<b>2.0</b>	0	0.0	1	33.3	2	66.7
<b>How often do you have sweets?</b>	Daily	<b>21</b>	<b>13.7</b>	2	9.5	16	76.2	3	14.3
	Almost every day	<b>46</b>	<b>30.1</b>	9	19.6	25	54.3	12	26.1
	2-3 times a week	<b>47</b>	<b>30.7</b>	13	27.7	29	61.7	5	10.6

	Once a week	<b>13</b>	<b>8.5</b>	4	30.8	6	46.2	3	23.0
	Less than once a week	<b>9</b>	<b>5.9</b>	0	0.0	7	77.8	2	22.2
	Very rarely	<b>15</b>	<b>9.8</b>	4	26.7	4	26.7	7	46.7
	I never do	<b>2</b>	<b>1.3</b>	2	100.0	0	0.0	0	0.0
<b>How often do you have fruit?</b>	Daily	<b>80</b>	<b>52.3</b>	17	21.3	48	60.0	15	18.7
	Almost every day	<b>60</b>	<b>39.2</b>	12	20.0	31	51.7	17	28.3
	2-3 times a week	<b>9</b>	<b>5.9</b>	2	22.2	7	77.8	0	0.0
	Once a week	<b>0</b>	<b>0.0</b>	0	0.0	0	0.0	0	0.0
	Less than once a week	<b>1</b>	<b>0.6</b>	1	100.0	0	0.0	0	0.0
	Very rarely	<b>3</b>	<b>2.0</b>	2	66.6	1	33.3	0	0.0
	I never do	<b>0</b>	<b>0.0</b>	0	0.0	0	0.0	0	0.0

Most children (70.6%) had their breakfast at school. The children rated the breakfast brought from home as the meal most often consumed in school (70.6%), and 20.3% respondents consumed their lunch in a school canteen. The highest percentage of children consumed sweets 2-3 times a week (30.7%) or daily (30.1%). Only 1.3% of the respondents did not eat sweets at all. More than half of the children declared that they ate fruit daily (52.3%) or almost every day (39.2%). Among the children whose nutrition style was recognized as the most correct, the children with an average level of physical fitness comprised the highest percentage (Table 4).

Table 5

*Using drugs and physical fitness in children*

Questions	Answers	Total		Physical fitness					
				Low level		Average level		High level	
		N	%	N	%	N	%	N	%
<b>Have you happened to smoke a cigarette?</b>	Yes	<b>4</b>	<b>2.6</b>	1	25.0	2	50.0	1	25.0
	No	<b>137</b>	<b>89.5</b>	29	21.2	78	56.9	30	21.9
	I will not answer	<b>12</b>	<b>7.8</b>	4	33.3	7	58.3	1	8.3
<b>If yes, where was it?</b>	At a birthday party	<b>2</b>	<b>1.3</b>	0	0.0	2	100.0	0	0.0
	With friends in a park	<b>1</b>	<b>0.6</b>	1	100.0	0	0.0	0	0.0
	At home	<b>1</b>	<b>0.6</b>	0	0.0	0	0.0	1	100.0
<b>Have you happened to drink alcohol?</b>	Yes	<b>11</b>	<b>7.2</b>	3	27.3	7	63.6	1	9.1
	No	<b>127</b>	<b>83.0</b>	25	19.7	72	56.7	30	23.6
	I will not answer	<b>15</b>	<b>9.8</b>	6	40.0	8	53.3	1	6.7
<b>If yes, where was it?</b>	I drank leftovers	<b>4</b>	<b>2.6</b>	1	25.0	2	50.0	1	25.0
	Beer with my father	<b>5</b>	<b>3.3</b>	2	40.0	3	60.0	0	0.0
	During holiday	<b>2</b>	<b>1.3</b>	0	0.0	2	100.0	0	0.0

Table 5 summarizes the pupils' responses on their use of drugs, taking into account the level of physical fitness. Of all the children, 89.5% said they never happened to light a cigarette, while 2.6% claimed to have contact with a cigarette. 7.8% respondents did not answer this question. Among the children who declared contact with a cigarette, some of them mentioned birth celebration (1.3%), park and house (0.6% each). 83.0% of children declared no contact with alcohol, while 9.8% of respondents refused to answer this question. In the group of children who came into contact with alcohol the most (3.3%) drank beer *in the company of their father*, slightly less (2.6%) drank alcohol leftovers. The vast majority of the respondents in each question categories represented the average level of physical fitness (Table 5).

**Discussion**

The results presented in this study confirmed the desirability of conducting research on the relationship between pro-health attitudes declared by early school-age children and their level of physical fitness. The most critical

factor determining physical fitness of a man is his physical activity. In the case of children, however, the expert opinions are divided. Some believe that there is a link between an active lifestyle and the level of physical fitness of children (Nettlefold et al., 2011; Daley, 2009; Epstein et al., 2001), while the second group of researchers is calling such assertion into question (Stodden et al., 2008; Fisher et al., 2005; Wrotniak et al., 2006; Monyeki & Kemper, 2007) indicating that it is still not clear which aspect of children's physical activity governs their physical fitness and body weight most critically (Must & Strauss, 1999; Sothorn & Gordon, 2003). Fisher et al. (2005) suggest that children characterized by a low level of physical fitness and fine motor skills lead a more sedentary lifestyle as opposed to the children with a higher level of coordination who are more physically active.

The results of our studies have confirmed the validity of the „second approach“ in this issue by showing that, despite oral declarations of daily outdoor activities by the vast majority of children, their active participation in physical activities has not found its reflection in the level of motor abilities they represent. Since the answers given by the respondents did not confirm this relationship, it is believed that not all the pieces of information provided by the respondents are true. Studies conducted on 6-7- year-old children in the United States confirm such assumption by showing that, despite the relatively high motor activity of children during the day, less than 2% of the time is devoted to intense physical exercise, whereas 80% of the time is used for the physical activity of low intensity (Gilliam et al., 1981). A similar picture of the phenomenon regarding the lack of relationships has been demonstrated in studies conducted on the same group of children, by assessing the impact of the broadly understood physical activity of the subjects on the level of their physical fitness (Podstawski & Borowska 2011), what is more, almost identical situation occurred also in the studies of early school-age children living in the countryside (Podstawski & Mroczkowska, 2011). The presented declarations do not correspond well with nationwide results. They show that only 30% of Polish children and young people are engaged in some forms of movement, of which the type and exercise intensity meet the physiological needs of the body (Lelonek & Jopkiewicz, 2011). In contrast to the presented phenomenon of self-stimulation in early school-age children (Przewęda & Dobosz, 2007), the proportion of physically inactive young people in Poland continues to increase (Simovska et al., 2012). A reduced level of physical activity and clear changes related to over-eating in children are occurring around the world (Weinsier et al., 1998; Chiolero et al., 2009).

The attitudes toward the use of drugs by children (alcohol, tobacco and drugs) are largely a form of imitation the behavior of their parents (Dalton et al., 2005), which was also confirmed in this study.

It should be noted that early school-age children mention specific actions and situations related to health in a piecemeal manner, focusing on their exteriors (Lisicki & Wilk, 1998). An example for this was the opinion expressed by the vast majority of children who considered themselves to be healthy. Perhaps, that is also why their oral declarations were not reflected in the level of their physical fitness. The study also showed the desirability of concomitant use of the methods of subjective (lifestyle interview) and objective (testing physical fitness) assessment of the level of biological condition (health) of the entity or a particular social group (Kornafel et al., 2000). The both techniques applied by us should complement each other, and in case of an absence of accurate answers from the respondent, the results obtained in motor tests correct them automatically. This assumption stems from the fact that a questionnaire is not a sufficiently precise tool for the study of preschool children (Mota et al., 2003), and therefore it should be supplemented by another research technique used for testing physical fitness, that is a measurement made on the basis of accurate and reliable motor test.

The results may also provide a frame of reference for the corresponding observations from this area, carried out in other regions of the country and abroad, especially as the number of works devoted to subjective self-assessment of health is much smaller in comparison to the extensive bibliography concerning its objective assessment.

### Conclusions

On the basis of the research study and its analysis, following conclusions have been formulated:

1. The largest percentage of early school-age children from the Primary School No. 2 in Malbork, achieved the average level of physical fitness (57.0%), while the percentage of pupils with low (22.0%) and high (21.0%) level was similar.
2. There were no relations between early school-age children's pro-health attitudes in the following areas: leisure activities, the state of their own health, nutrition and the use of drugs, and the level of the physical fitness they represent.

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