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Original Research Article

Relationships between lifestyle and motor fitness in early-school children

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ABSTRACT

Introduction: Motor fitness is considered as an individual health measure. Its impact on human organism is extremely important during the early school years due to the intensive child's growth at that time.
Aim: The aim of this study was to assess the relationship between the health behavior of early-school children and their motor fitness.
Materials and methods: A group of 60 school children attending I–III classes of a rural school was examined in June 2008. The children's motor fitness was determined by employing motor ability tests and interview questionnaires to categorize the children's lifestyles and nutritional patterns. Results were analyzed statistically.
Results and discussion: The majority of these school children presented a medium level of motor fitness. Children's opinions concerning their health status and nutritional patterns did not influence their motor fitness. However, a higher percentage of children with a high level of motor fitness was observed among those children with a positive attitude towards health promoting behaviors. A high level of motor fitness was found in about 50% of children spending their free time outdoors 2–3 times a week and a low level in over 57% of children seldom spending their free time outdoors. A higher percentage of children with a low fitness level was detected among those declaring contact with cigarettes and alcohol.
Conclusions: Such factors as physical activities during leisure time, children's opinions on their health status and nutritional patterns had only a slight influence on the levels of motor fitness.

1. Introduction

Problems concerning human health and counteracting threats posed to it are most important presently. Health status and health consciousness in the context of health promoting lifestyle arouse general suspicions.[30] This is not only a Polish problem, for all highly developed countries struggle with this situation.[37] This is the reason why warning

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young people to take care of their health and to act in favor of public health have become topical issues recently.[16,18,19,32,38] Advocates of a general health promoting education design syllabuses and create organizations to propagate a healthful style of life among people of different ages.[2,4,6,14,22,35]

In 1946 the World Health Organization formulated in its constitution the definition of health: it is not merely the absence of disease or infirmity but a state of complete physical, mental, and social well-being.[41] Mental and physical health broadly understood is the most valuable feature for a happy and satisfactory life[34] which changes in time. Its basis is created in childhood and youth. It can be possessed; one can lose it, but also restore, regain, strengthen, cultivate and improve it at every stage of one's life.[8]

The term "health" has many meanings and can be interpreted and used according to the context in which it is used.[23] The increased significance of activity, physical efficiency and fitness as individual measures of health has been observed for many years as belonging to a group of conditions defining health.[6,11,13,15,28] The influence of these attributes on the human organism plays an extremely important role during early-school time ages because of the intensive development of a child during this period of life.[7,9,20,29,31,39]

2. Aim

The aim of this study was to assess the relationship between the health behaviors of early-school children and their motor fitness. The aim was realized through searching answers to the following questions:

1. What is the level of motor fitness for I–III class school children?
2. Are there any links between children's health behaviors and level of their motor fitness?

3. Materials and methods

A group of 60 school children (32 girls and 28 boys) aged 7–9 years old (average age 8.4 years), attending I–III classes of the Feliks Łoyka Primary School in Szropy, Pomorskie Province, was examined in June 2008. The school functions in a typically rural environment. The study comprised 100% of early-school-forms children attending the school in Szropy (Fig. 1).

Children's motor fitness was determined employing motor ability tests. Each time the subjects were explained in detail and shown how to perform each exercise. Next, a 10 min warming up of a general nature was conducted. Children performed each exercise twice and the better result was accepted to ensure the reliability of the test performance. Motor tests included: standing long jump, sit-ups (30 s), 4×10 m shuttle run, skipping with clapping of hands (8 s), squats with backward leg extensions (3 min), standing forward bend, sit and reach, medicine ball backward throw with both hands, medicine ball forward throw with both hands, and bent arm hang. An interview questionnaire containing

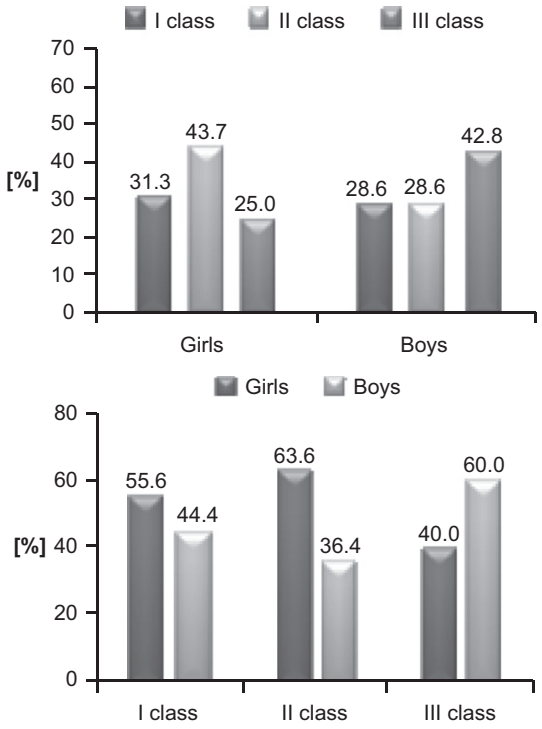

Fig. 1 – Percentage of examined children depending on school class and sex.

Table 1 – Level of motor fitness of the children.

Children with results	Weak		Average		Good	
	n	%	*n*	%	*n*	%
Average of all motor tests	14	22.6	33	55.0	13	22.4

23 open or closed questions was employed to determine children's lifestyles, nutritional patterns, history of disease and contact with stimulants.

To evaluate the level of motor fitness a three-stage scale was created using statistical analysis and a χ^2 test: results below average were considered as weak ones, average – mean and over average – good. Statistical analysis was performed utilizing Statistica PL software.[36]

4. Results

Results of the motor fitness tests are presented in Table 1. The majority of children (55.0%) gained average results in all tests; the percentage of weak and good results was much lower, 22.6% and 22.4%, respectively.

The level of motor fitness was compared to the children's questionnaire responses (Table 2). The majority of girls and boys (78.3%) declared spending their free time outdoors every day. In this group the greatest percentage of children (53.2%) presented an average level of motor fitness. About 50% of children declaring spending their free time outdoors 2–3 days a week were characterized by a high level of motor fitness

Table 2 – Children's opinions concerning spending free time outdoors versus their motor fitness levels.

Question	Answer	Total		Motor fitness level					
				Low		Average		High	
		n	%	*n*	%	*n*	%	*n*	%
Do you spend free time outdoors?	Every day	47	78.3	9	19.1	25	53.2	13	27.6
	2–3 times a week	4	6.7	1	25.0	1	25.0	2	50.0
	Seldom	7	11.7	4	57.1	2	28.6	1	14.3
	Never	2	3.3	0	0	2	100.0	0	0
What do you do there?	Ride a bicycle	38	63.3	8	21.0	20	52.6	10	26.3
	Play	24	40.0	6	25.0	8	33.3	10	41.7
	Walk	18	30.0	5	27.8	8	44.4	5	27.8
	Play "classes"	4	6.7	1	25.0	1	25.0	2	50.0
	Skip	7	11.7	1	14.3	4	57.1	2	28.6
	Run	32	53.3	9	28.1	15	46.9	8	25.0
	Swim	11	18.3	1	9.0	7	63.6	3	27.3
Who accompanies you there?	School friends	32	53.3	8	25.0	18	56.2	6	18.7
	Neighbor friends	13	21.7	2	15.4	5	38.5	6	46.1
	Parents	3	5.0	0	0	2	75.0	1	25.0
	Siblings	15	25.0	5	33.3	6	40.0	4	26.7
	Other adults	2	3.3	1	50.0	0	0	1	50.0
	Others	2	3.3	0	0	1	50.0	1	50.0
Your preferred way of spending your free time	TV and video	14	23.3	2	14.3	10	70.4	2	14.3
	Computer games	21	35.0	6	28.6	9	42.8	6	28.6
	Book reading	7	11.7	1	14.3	4	57.1	2	28.6
	Painting, drawing	4	6.7	0	0	2	50.0	2	50.0
	Walking	7	11.7	2	28.6	3	42.9	2	28.6
	Playing outdoors	20	33.3	6	30.0	11	55.0	3	15.0
	Other	2	3.3	0	0	0	0	2	100.0

and those seldom playing outdoors demonstrated the highest percentage (57.1%) of low motor fitness. All children declaring that they did not spend their free time outdoors had an average motor fitness level.

Children declared that during their stay outdoors they preferred to ride a bicycle (63.3%), run (53.3%), play various games (40.0%), and walk (30.0%). About 18.3% of the respondents said that they swam; this is consistent with the Polish statistical data indicating that over 80% of Poles cannot swim.[33] Most children spending their free time outdoors gained an average motor fitness level; the exceptions were "playing various games" and "playing classes" with the highest percentage of children having a high level of motor fitness (Table 2).

School friends were indicated most often (53.3%) as companions to spend free time outdoors with, next siblings (25.0%), and neighbor friends (21.7%). It was alarming that only 5.0% of parents spent time outdoors playing with their children. Children spending their free time outdoors with neighbor friends were characterized by a high motor fitness level in the highest percentage (46.1%). Computer games (35.0%), playing outdoors (33.3%) and watching TV and video (23.3%) were the most favorite ways to spend free time and the highest percentage of these children were of an average motor fitness.

The majority of I–III form children (76.6%) considered themselves healthy; in this group most children were of an average motor fitness level. As many as 80.0% of all children claimed they had suffered from diseases earlier and 45.0% did not know the name of the disease. Children knowing the name of their diseases most often reported smallpox (10.0%), next roseola and angina (8.3% each), pneumonia (5.0%), and influenza (1.7%). Most of these children were of an average motor fitness level (Table 3).

As many as 63.3% of children declared having breakfast at home (Table 4). In both groups, children having and not having breakfast at home, the average level of motor fitness dominated. The largest number of children (66.7%) eat a packed lunch at school brought from home; 45.0% have dinner at the school canteen; only 13.3% buy food at the school shop and only 5.0% of children declared having no food at school. In the groups of children consuming a packed lunch, dinner at the school canteen and also the group having no food at school, the average motor fitness level was most often recorded.

Concerning sweets, 23.3% of children consume them daily; 28.3% – almost every day; 15.0% – 2–3 times a week, and 5.0% – once a week. Over 18.3% of children have sweets seldom and 1.8% – never. In all groups an average level of motor fitness was predominant, with the exception of one child who never had sweets (a low level of motor fitness). About 46.7% of children declared a daily consumption of fruits; 18.3% – almost every day; 15.0% – 2–3 times a week, and 8.3% – once a week. A minimal percentage of children consumed fruits less than once a week and seldom (5.0% each) and those not eating fruits – only 1.7%. An average fitness level was predominant in all comprised groups.

The results concerning stimulant intake by early-school children are interesting (Table 5). In total, 10.0% of all the children admitted to smoking cigarettes and 3.3% did not answer this question. Most of them smoked at home. The

Table 3 – Children's opinions concerning their health state versus their motor fitness levels.

Question	Answer	Total		Motor fitness level					
				Low		Average		High	
		n	%	*n*	%	*n*	%	*n*	%
Are you healthy?	Yes	46	76.6	11	23.9	25	54.3	10	21.7
	No	7	11.7	3	42.8	1	14.3	3	42.8
	Do not know	7	11.7	0	0	4	57.1	3	42.8
Did you suffer from any disease earlier?	Yes	21	35.0	3	14.3	14	66.7	4	19.0
	Yes, but do not know the disease name	27	45.0	6	22.2	12	44.4	9	33.3
	No	12	20.0	5	41.7	4	33.3	3	25.0
If yes—name it	Pneumonia	3	5.0	0	0	3	100.0	0	0
	Angina	5	8.3	0	0	4	80.0	1	20.0
	Influenza	1	1.7	0	0	1	100.0	0	0
	Smallpox	6	10.0	0	0	4	66.7	2	33.3
	Roseola	5	8.3	2	40.0	2	40.0	1	20.0

Table 4 – Children's opinions concerning their nutritional patterns versus their motor fitness levels.

Question	Answer	Total		Motor fitness level					
				Low		Average		High	
		n	%	*n*	%	*n*	%	*n*	%
Do you have breakfast at home?	Yes	38	63.3	8	21.0	20	52.6	10	26.3
	No	22	36.7	6	27.3	10	45.4	6	27.3
Do you consume food at school?	Packed lunch	40	66.7	10	25.0	21	52.5	9	22.5
	Dinner at canteen	27	45.0	5	18.5	15	55.5	7	25.9
	Food bought at shop	8	13.3	1	12.5	5	62.5	2	25.0
	Food bought at school shop	1	1.7	0	0	0	0	1	100.0
	Eating nothing	3	5.0	1	33.3	2	66.7	0	0
How often do you eat sweets?	Every day	14	23.3	3	21.4	7	50.0	4	28.8
	Almost every day	17	28.3	4	23.5	7	41.2	6	35.3
	2–3 times a week	9	15.0	2	22.2	5	55.6	2	22.2
	Once a week	3	5.0	1	33.3	2	66.7	0	0
	Less than once a week	5	8.3	1	20.0	3	60.0	1	20.0
	Seldom	11	18.3	2	18.2	6	54.5	3	27.3
	Never	1	1.7	1	100.0	0	0	0	0
How often do you eat fruits	Every day	28	46.7	5	17.8	15	53.6	8	28.6
	Almost every day	11	18.3	2	18.2	4	36.4	5	45.4
	2–3 times a week	9	15.0	4	44.4	5	55.6	0	0
	Once a week	5	8.3	0	0	3	60.0	2	40.0
	Less than once a week	3	5.0	0	0	2	66.7	1	33.3
	Seldom	3	5.0	2	66.7	1	33.3	0	0
	Never	1	1.7	1	100.0	0	0	0	0

majority of the respondents (86.7%) declared as to not smoking at all. The predominating fitness level was average for all groups of children.

In total, 16.7% of the respondents declared alcohol drinking and 8.3% refused to answer this question. About 75.0% of the children declared having had no contact with alcohol. Children having contact with alcohol indicated that daddy (10.0%) or home environment (5.0%) and parents' party (5.0%) provided the occasions to drink. Most children with a low level of motor fitness were in the group of children having contact with alcohol and the group of total abstainers generally had an average motor fitness level.

5. Discussion

Some opinions presented by the studied girls and boys should be considered in particular. Early contact of the school children with smoking (10.0% of respondents) and alcohol drinking (about 16.7%) should arouse concern. It is also alarming that such undesirable behaviors begin mostly in the child's environment, i.e., at home. Family to a large extent creates a basis for life attitudes and behaviors in the grown up human.[1,26] Health status of a child depends mostly on the level of the adults' health culture considered as a system of values attributed to health.[10,17] Stimulants are very attractive

Table 5 – Children's opinions concerning their stimulant intake versus their motor fitness levels.

Question	Answer	Total		Motor fitness level					
				Low		Average		High	
		n	%	*n*	%	*n*	%	*n*	%
Have you ever smoked?	Yes	6	10.0	2	33.3	4	67.7	0	0
	No	52	86.7	11	21.1	26	50.0	15	28.9
	No answer	2	3.3	1	50.0	0	0	1	50.0
If yes – where?	At home	5	8.3	2	40.0	3	60.0	0	0
	During uncle's birthday	1	1.7	0	0	1	100.0	0	0
Have you ever drunk alcohol?	Yes	10	16.7	4	40.0	3	30.0	3	30.0
	No	45	75.0	8	17.8	25	55.5	12	26.7
	No answer	5	8.3	2	40.0	2	40.0	1	20.0
If yes – where?	At cousin's	1	1.7	1	100.0	0	0	0	0
	With a neighbor friend	1	1.7	1	100.0	0	0	0	0
	Taken from daddy	6	10.0	2	33.3	2	33.3	2	33.3
	During parents' party	3	5.0	2	66.7	0	0	1	33.3
	At home	3	5.0	1	33.3	1	33.3	1	33.3

for some children who are unaware of their potential toxicity.[25] An increased level of the so called "health risk" behavior is characteristic in regions with low economic development and relatively high unemployment.[3,12] The country under this study is an example of such a region.

Another unfavorable observation concerns insufficient time spent by children out of doors. This is indeed surprising, because rural children were usually thought to spend much more time outdoors than children living in town[27] and the urbanization degree minimally differentiates children's participation in motor exercises.[5]

This study did not confirm the influence of such factors as children's opinions concerning their health status and nutritional patterns on their motor fitness level. However, it has been observed that more children with a high fitness level were detected among children considering health promotion elements as positive. About 50.0% of children spending their free time outdoors 2–3 times a week were characterized by a high fitness level and 57.1% of those seldom spending their free time outside exhibited a low level. The percentage of children with a low motor fitness level was higher among children declaring contact with cigarettes and alcohol, in comparison to children not having contact with stimulants.

A worsened status of physical condition among the younger generation was also observed in other developed countries, e.g., experts expressed the opinion that American children exemplified the so called "fitness crisis".[15,24,33] It is believed that a low level of motor fitness is a secondary effect of the sedentary lifestyle, a low level of physical activity and too big a body mass and fat content resulting from improper nutrition.[9,13,16]

6. Conclusions

It has been discovered that the highest percentage (55.0%) of rural children were characterized by an average level of motor fitness. A low level of fitness was determined for 22.6% of children and 22.4% of them achieved high results during motor fitness testing.

Statistical analysis did not confirm the dependence of the children's motor fitness on: the form of free time spending, children's opinions concerning their own health, nutritional patterns and stimulants intake. However, more children exhibiting a positive attitude towards health promotion elements gained a higher score in motor fitness levels.

Conflict of interest

None declared.

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