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Original article

PHYSICAL DEVELOPMENT OF 16-YEAR-OLD YOUTH IN POLAND

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Abstract

*Problem statement.*In determining the physical development of children and young people one of its characteristics is evaluated, which is grow (height and body mass). Correct physical development promotes health and well-being in every period of human life. The aim of this study was to determine the state of the physical development of 16-year-old youth in Poland.

Methods. The study was conducted in the school year 2008 at vocational schools in Kielce, Poland. The study included 2067 adolescents aged 16 years. In view of the 734 tested disorders in health and development were found. Finally, the study involved 210 people, both girls (33 people) and boys (177), coming from a city (over 39%) and from a village (nearly 61%).

Results. In more than 16% of respondents were identified abnormalities in physical development (grow), especially among technical school students (over 15%) living in the city. Identified problems, low body mass (11%) and short stature (above 8%) predominated among the tested living in the city. Obesity is a health problem for 5% of the respondents from the rural environment. Underweight was confirmed among youth educating on the level of basic vocational schools (nearly 14%), living in the countryside.

A strong correlation and low strength of the relationship were confirmed ($p < 0.05$; $r_c = 0.26$) between physical development of the tested and learning in their chosen profession.

Conclusions. Growth disorders may limit among others physical activity, fitness and exercise capacity of respondents. It is necessary to take the medical care of young people with identified disorders in physical development. It is necessary to reinforce physical activity among young people.

Keywords: health, physical development, grow, vocational school.

Introduction

Data on physical development are the main positive indicator of the health of children and adolescents. Proper physical development affects the successful mental, motor, social and emotional development (Markowska , 2002; Taras, Potts-Datema, 2005; Nowak - Starz, 2008, Cieśla, 2011).The World Health Organization (WHO) provides a broad approach to the implementation of preventive health care for students (World Health Organization, 1997).

In Poland, since 1972 preventive medical examinations of children and young people have been carried out in certain age groups. Performed screening tests of 16 -year-old youth are aimed to determine the level and pace of physical development, to make qualifying group for physical education and school sports, to detect potential health problems. Counseling is conducted for healthy lifestyle and choice of further education or work (Woynarowska, 2000; Oblacińska, Woynarowska, 2002; Regulation of the Minister of Health, 2004; National Health Program, 2007; Król, Kwiatkowski, 2009, Regulation of the Minister of Health, 2009).

At age 16, there is a dynamic development in the course of which in some individuals are revealed or exacerbated a variety of disorders (Woynarowska, 2000; Nowak-Starz, 2008; Woynarowska, 2010).

In adolescence there are intensive physical changes to the construction and body weight (Suliga, 2000; Król, 2004; Kułaga et al, 2011). In 2010, 18% of boys and 11% of girls aged 15-16 years were overweight and obese (Wojtyniak, Goryński, Moskalewicz, 2012).

The doctor determining the level of physical development of youth, in the event of irregularities (short stature, obesity, low body mass) may decide to limit the study in selected vocational school and the chosen direction of education (Oblacińska, Woynarowska, 2002; Oblacińska 2013). For there are numerous physical and physiological constraints on the choice of profession and vocational training. These include, among others, occupations requiring heavy physical effort, standing posision, difficult climatic conditions, being at the height, good manual efficiency (Woynarowska, 2000; Roesler et al, 2000; Vieweg et al, 2007). Deviations in health status and development of the youth are associated with a

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higher risk of accidents and injuries.

Properly extending physical development generally determines the values of health and psycho-physical capabilities of young people, which undoubtedly plays an important role in the learning process, choosing a career and in adulthood.

Material and methods

The study was conducted in the school year 2008 at vocational schools in Kielce, Poland. The study included 2067 adolescents aged 16 years. In view of the 734 tested disorders in health and development were found. Finally, the study involved 210 people, both girls (33 people) and boys (177), coming from a city (over 39%) and from a village (nearly 61%). The study used two equivalent methods: the method of documentary research and diagnostic survey. The statistical correlation of selected features was verified with non-parametric Chi-square test.

Results

It was found that young people surveyed derive mainly from the rural environment. Educating in vocational schools is of great interest in the environment (Table 1).

Interest of the respondents in education in vocational schools is undoubtedly related to the short period of training (2-3 years) in jobs that are very popular and provide an opportunity for the labor market (Table 2).

Table 1. Characteristics of the study group divided into the chosen school and environment.

Name of school	Town		Village		Total	
	n	%	n	%	n	%
Complex School of Information Tchnology	34	41,46	23	17,97	**57**	**27,14**
Complex of Mechanics and Economics Schools	13	15,80	38	29,69	**51**	**24,29**
Complex of Vocational Schools No 1	35	42,68	67	52,34	**102**	**48,57**
Total	**82**	**100,00**	**128**	**100,00**	**210**	**100,00**

Table 2. The students in the study with regard to the type of school and educational direction

Name of school	Job/direction of education	Type of school						Total	
		Technical		Basic vocational		Specialised secondary school			
		n	%	n	%	n	%	n	%
Complex School of Information Tchnology	electronics technician	10	5,78	0	0,00	0	0,00	**10**	**4,76**
	IT technician	39	22,54	0	0,00	0	0,00	**39**	**18,57**
	information management	0	0,00	0	0,00	8	100,00	**8**	**3,81**
Complex of Mechanics and Economics Schools	mechatronics technician	9	5,20	0	0,00	0	0,00	**9**	**4,29**
	polygraphy technician	21	12,14	0	0,00	0	0,00	**21**	**10,00**
	mechanical technician	21	12,14	0	0,00	0	0,00	**21**	**10,00**
Complex of Vocational Schools No 1	construction technician	11	6,36	0	0,00	0	0,00	**11**	**5,24**
	technician of landscape architecture	13	7,51	0	0,00	0	0,00	**13**	**6,19**
	Environmental technician	4	2,31	0	0,00	0	0,00	**4**	**1,90**
	Water treatment technician	7	4,05	0	0,00	0	0,00	**7**	**3,33**
	road technician	10	5,78	0	0,00	0	0,00	**10**	**4,76**
	geodesy technician	11	6,36	0	0,00	0	0,00	**11**	**5,24**
	wood technology technician	7	4,05	0	0,00	0	0,00	**7**	**3,33**
	clothing technology technician	10	5,78	0	0,00	0	0,00	**10**	**4,76**
	bricklayer	0	0,00	20	68,97	0	0,00	**20**	**9,52**
	Painter/wallpaper hanger	0	0,00	5	17,24	0	0,00	**5**	**2,38**
	carpenter	0	0,00	4	13,79	0	0,00	**4**	**1,90**
Total		**173**	**100,00**	**29**	**100,00**	**8**	**100,00**	**210**	**100,00**

Physical development disorders were found in over 16% of the respondents studying primarily in professions: road technician, geodesy technician, wood technology technician, clothing technology technician, bricklayer and carpenter.

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The most common of these was a shortage of body weight (above 7%), often manifested in boys from towns. Comparatively the young people were diagnosed with short stature (almost 4%) and obesity (over 4%). Adolescents lived in different environments (urban and rural).

More growth disorders were revealed among students at technical school (15.61%), mainly in boys living in the city (Figure 1).

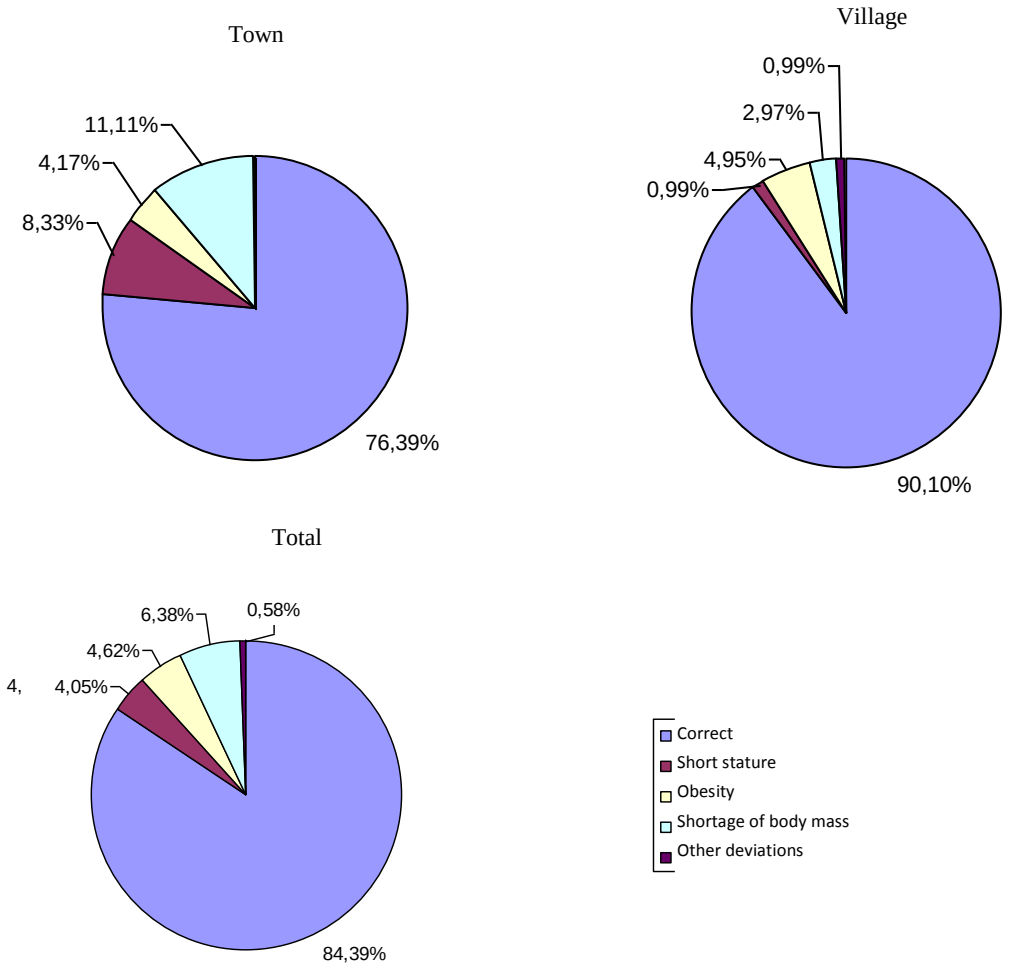

Figure 1. Growth disorders among students of technical schools divided into the environment.

Identified disorders, low body mass (over 11%) and short stature (above 8%), dominated among students living in the town, while obesity (almost 5%) and short stature (nearly 3%) concerned respondents from the rural environment.

In the group of 29 peers studying at the basic vocational level, growth disorders were observed in over 13% of them coming from a village. These deviations were associated mainly with a shortage of body weight. The same results were obtained in specialized secondary schools.

The results were statistically analyzed determining the dependence of growth on the chosen by the students of education direction (Table 3).

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Table 3. Growing vs chosen by the respondents education direction

Grow (physical development)	Education direction							
	Technical		Basic vocational		Specialized		Total	
	n	%	n	%	n	%	n	%
Correct	146	84,39	25	86,20	4	50,00	**175**	**83,33**
Short stature	7	4,05	1	3,45	0	0,00	**8**	**3,81**
Obesity	8	4,62	0	0,00	1	12,50	**9**	**4,29**
Shortage of body mass	11	6,36	2	6,90	2	25,00	**15**	**7,14**
Other deviations	1	0,58	1	3,45	1	12,50	**3**	**1,43**
Total	**173**	**100,00**	**29**	**100,00**	**8**	**100,00**	**210**	**100,00**

$\chi^2 = 16,299 > \chi^2_{0,05;\,8} = 15,507$; $r_c = 0,26$

Results of chi-square test (χ^2) confirmed the strong correlation and low strength of the relationship ($p < 0.05$; $r_c = 0.26$) between the result of the medical examination on the growth and education direction chosen by the subjects. It can be seen that physical development disorders may be considered by the doctor in terms of limitations of education in the chosen by the student vocational school and related educational direction. It must be assumed that in the case of surveyed students growth disorders can be compared by a physician with the exercise abilities of respondents (eg shortage of body weight - lifting heavy objects) and their agility (obesity - less efficiency and physical exercise).

Discussions

The dynamic development of the market economy, thereby increasing demand for a variety of professions, have increased interest among young people in vocational education. The surveyed youth chose vocational education at secondary school and basic vocational education.

Both boys and girls come from rural environment. A clear relationship was confirmed between the environment in which students are brought up and the selected school ($p<0.001$).

The choice of career at such a young age (16 years old), in the period of adolescence, requires a many-sided support of families, schools, doctors and nurses, employers, state (Woynarowska, 2000; Markowska, 2002; Nowak - Starz, 2008). Not without significance is comprehensive knowledge of the student's chosen profession, of the requirements during its execution, and thus their opportunities and abilities (Król, Kwiatkowski, 2009).

Although implemented in Poland preventive medical examination show numerous health disorders of 16 year-olds, including physical development (Woynarowska, 2010; Oblacińska, 2013), it was found that the subjects and their parents do not take into account the health status in career choices.

As previously pointed out in the research by Woynarowska, 2000; Roesler et al, 2000, Viewegi et al, 2007, Taras H, Potts - Datema, 2005; Kułaga et al, 2011, diagnosed among nearly16 % of respondents growth disorders: overweight and obesity (4.29 %), short stature (3.81 %) and low body mass (7.14 %) raise concerns about the health safety at risk of teens as well as their future career.

A clear statistical relationship was confirmed between the results of the medical examination and selected by the respondents direction of education in most of the analyzed features. Recognized disorders in physical development - grow ($p<0.05$) significantly influence the direction of education chosen by the respondents. At the time of practical training and subsequent career people with developmental disorders (eg short stature) may have unsuited to their growth workplaces, which creates a risk of injury and promotes the adoption of unergonomic position during work. No exercise limitations are meaningless such as a shortage of body weight - lifting heavy objects, obesity - less efficiency and physical exercise.

To support the actions outlined in the operating objective 8 (National Health Programme 2007-2015, 2007) studies and the obtained results confirming the significant disorders of physical development among respondents require continuation of research to determine the essential causes that adversely affect the health of adolescents and their elimination.

Conclusions

1. Youth in adolescence show disorders of physical development.
2. Growth disorders affect the limitations of practical training in their chosen profession.
3. Abnormal physical development significantly reduces any possibility of a young man.

4. The discussed issue needs further study for a more exact understanding of the problem and the effect of corrective actions taken.

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