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REVIEW ARTICLE

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PHYSICAL ACTIVITY, OBESITY AND HEALTH PROGRAMS IN SELECTED EUROPEAN COUNTRIES

Key words: childhood and adolescence, physical activity, obesity, health programs.

ABSTRACT

One of the main health-related problems Europe is facing today is the increasing prevalence of obesity in all age groups, especially in youth. According to the International Obesity Task Force (2004) 155 million school-age children and adolescents worldwide show symptoms of obesity or overweight. Obese children are less confident, have lower self-esteem and engagement rate both in and after school physical activity. This is becoming a huge and very costly economic and social problem as well. Positive changes will require modification of the physical education curriculum, especially its contents and teachers' approach. Specially designed programs are required. HEALTH(A)WARE (128737-CP-1-2006-1-DE-Comenius-C2) is a project funded by the European Commission in the Socrates-Comenius Program to enable experimental health teaching within and across school courses. Cross-curricular instruction of knowledge and skills may help pupils in the process of lifelong learning, and hopefully may be implemented in the curricula of European schools.

INTRODUCTION

For many people health is the most precious personal good. It is astounding that the term "health" remains so difficult to define in a precise and congruent way [39]. The term "health" is a construct which can be investigated by diverse fields of science, e.g. medicine, psychology, biology, law or sport science. There is common agreement that childhood and adolescence constitute a crucial stage for health promotion and illness prevention. A health-oriented and positive lifestyle is acquired and health-beneficial or health-hindering coping strategies become manifest and adopted for later periods of life. Therefore, it seems understandable that different scientific disciplines and organizations, e.g. World Health Organization (WHO), focus on childhood and adolescence in their health promotion activities.

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Presently, some health-related topics seem to be more urgent than others. Among these is the widely accepted connection between obesity and the absence of health. In this regard the increasing prevalence of obesity in all age groups, and specifically in children and adolescents is seen as one of the main health problems in Europe [11, 24, 35]. According to reports of the International Obesity Task Force [19] 155 million school-age children and adolescents worldwide show symptoms of obesity or overweight. Among those 30-45 million are obese children and adolescents aged 5-17 years, which means that every tenth child worldwide is overweight [22] (Table 1). The annual increase in childhood obesity has been steadily growing, and the current rate is 10 times higher than in the 1970s [3].

Obesity can be effectively counterbalanced with physical activity (PA). Physical activity reduces the increase of the fat tissue [38], body fat deposits or the size of fat cells [23, 28, 40]. On the other hand low physical activity and a sedentary lifestyle are related to prevalence of obesity [10, 12-15, 18, 44]. According to this, obesity and low PA may be effectively counteracted with physical education. There are several international programs aimed at development of children's and adolescents' health awareness through changes in physical education at school. A good example of such an initiative is the project *Health(a)ware: An experienced-based learning and teaching approach for physical and health education* (128737-CP-1-2006-1-DE-Comenius-C2), funded by the European Commission in the Socrates-Comenius Program and carried out in six European countries: Austria, Czech Republic, Germany, Norway, Poland and Spain.

Before taking effective measures, it is necessary to analyse the present state of affairs. The aim of this article is to discuss obesity and overweight prevalence, level of PA as well as selected health-promotion programs in five of the six countries participating in the *Health(a)ware* project.

AUSTRIA

In the following part some selected aspects of the health status of children and adolescents in Austria are outlined, first of all, the BMI of Austrian youth. In 2006, about 12.4% of all Austrian pupils had an increased BMI (boys 16.6%; girls 8.3%), and 3.1% were labeled "obese". 35.9% of the pupils think that they are too fat (boys 28.9%, girls 42.8%), the feeling of being too fat increases especially among girls as they get older (11-year old girls: 33.6%; 15-year-old girls: 49.4%). Compulsory P.E. lessons comprise four hours a week in the 1st and 2nd grades (10- and 12-year-old pupils), and three hours a week in the 3rd and 4th grades (13- and 15-year-old pupils) [2]. Kleiner [21] assessed PA by means of the "sport activity index" comprising seven items. Based on their sport activity (amount, frequency, intensity, etc.) pupils can be categorized into groups of no-, occasional-, spare time-, intensive- or competitive pupils (Fig. 1).

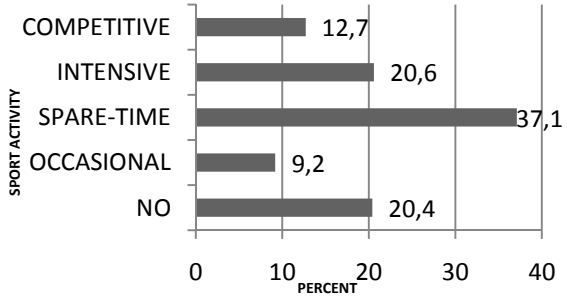

Figure 1. Sport activity of 15-19-year old pupils; n=1355 [21]

According to the results of a Health Behaviour in School-aged Children Study [17] of Austrian pupils published in 2007, 11-, 13- and 15-year-old pupils exercise on average 4.2 days a week for at least one hour (Fig. 2). This varies depending on age and gender. In 1998, 11-year-old boys exercised on 4.98 days a week for more than one hour. In 1998, 15-year-old boys engaged in PA on 3.78 days a week. In the case of girls, sport activity decreased from 4.46 to 3.17 days.

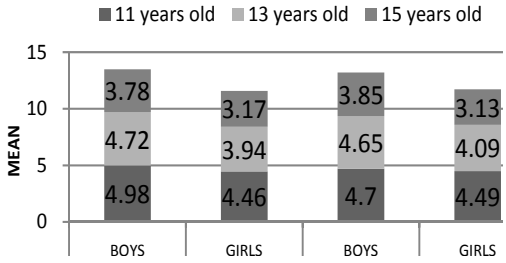

Figure 2. The average number of days a week on which pupils (11, 13, 15-year old) are physically active for at least one hour a day [16, 17]

Earlier results of the Austrian Health Behaviour in School-aged Children Study [16] published in 2000 are similar. The study showed that only every fourth (24.7%) 11-year-old, every fifth (21%) 13-year-old and every tenth (11%) 15-year-old fulfilled the recommended requirements for beneficial PA. The results indicate how PA decreases with age. The younger the pupils are (especially boys), the more likely they are to engage in regular PA.

Despite numerous and successful initiatives in the area of health promotion at school (e.g. projects supported by the Fund for a Healthy Austria (FGÖ), like School in Motion and Healthy School Food) one question remains: How can physical education fundamentally change the complex cognitive, social-emotive and habitual structures of children and adolescents? Health promotion at school may be successful in a proper reference framework, where relevant problems can be identified and solutions can be worked out and offered to teachers, pupils and parents. Furthermore, school autonomy and a general opening up of learning and teaching are important aspects on the way towards an effective health promotion in school.

CZECH REPUBLIC

Results concerning obesity in the Czech Republic were taken from the COMPASS project initiated in the United Kingdom and Italy in 1995 for the purpose of cross-national comparisons of statistical data on participation in sport in different European countries. The Czech part of the project was carried out in 2006 and included 4,201 subjects aged 9-19 years old. The research used the COMPASS II questionnaire adapted to Czech conditions. The Czech results concerning students' participation in sport and Body Mass Index (BMI) were compiled by Rychtecký [37] (Fig. 3; Fig. 4).

The focus on health themes in Czech schools started to be systematically developed only recently. In 2002, the government of the Czech Republic adopted a resolution on the implementtation of the "Long-term program for the improvement of the state of health of the inhabitants of the Czech Republic – Health for all in the 21st century" (shortened as Health 21). This program is aimed at improving health of Czech citizens. It incorporates the objectives of the World Health Organization in the context of the Czech Republic. A part of the program is devoted to the development of a system of education aimed at teaching young people how to become responsible for their health; implementation of health promotion in schools through the Frame Educational Programs and launching of the "Health Promoting School" program.

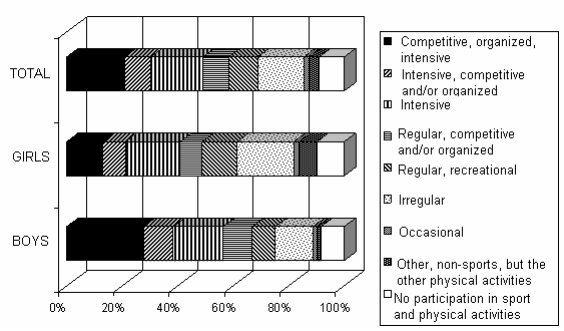

Figure 3. Participation in sport and movement activities; 9-19-years olds [37]

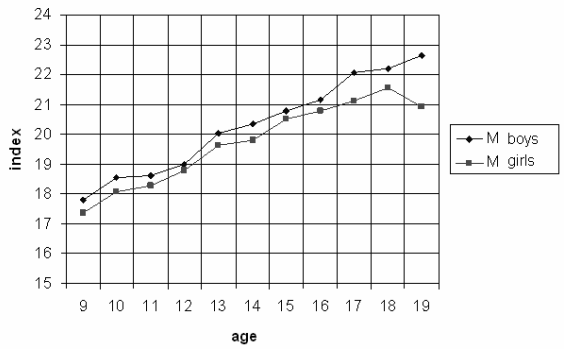

Figure 4. Body Mass Index according to subjects' sex and age (index); 9-19-year olds (M = mean) [37]

The Frame Educational Programs aim to unite different school subjects through key topics. One of them is "The Human Being and Health". The Frame Educational Programs are being prepared and tested in pilot schools, and should be launched in all Czech schools in the near future. The frames of the programs have been developed by the Research Institute of Education in Prague (Výzkumný ústav pedagogický v Praze) but the programs are fully developed and implemented by each school individually. Since there is no subject directly related to health in Czech secondary schools at present, and since it is also improbable

that secondary schools will introduce a new subject, health issues will probably be included within different courses or taught in the form of projects. The inclusion of the topic of health into the grammar school system is expected to foster students' awareness of their health and to develop practical skills, which will have an effect on their future life.

Another part of Health 21 is the Health Promoting School program supervised by the National Institute of Public Health. This program dominates in primary schools, but recently it has started to expand into secondary schools as well.

GERMANY

The German Health Interview and Examination Survey for Children and Adolescents (KIGGS) examined 17,641 boys and girls aged 3 to 17 years. The survey provides nationwide representative data about the health status of children and adolescents in Germany. The study examined the level of PA, food consumption, smoking, alcohol and drug abuse as well as physiological parameters such as bodyweight and body fat. It pointed to the implementation of health intervention programs for children and adolescents.

Overweight and obesity are serious problems among German children and adolescents. Based on the percentiles of the BMI of Kronmeyer-Hauschild [25] the data show that 15% of subjects are overweight as they exceed the 90th percentile of the reference system and 6.3% exceed the 97th percentile, which rates them as obese. The BMI increases with age: the prevalence of overweight in children between 3 and 6 years is 9% and of obesity is 2.9%. The proportion of overweight and obesity rises from 15% (6.4% of 7-10-year olds) to 17% (8.5% of 14-17 year olds) [26].

Regular PA seems to have a positive effect on health at any age [20, 42, 45]. Measures to enhance exercises are important parts of health promotion. The results of the KIGGS study indicate that 75% of girls and boys between 3 and 10 years engage in sport activities at least once a week. Among the 11-17-years-olds the involvement in sports is decreasing: only 25% of the boys and 15% of the girls practice sports on a regular basis.

The health promotion approach at school has changed within the last years. The traditional conceptions of education and deterrence were mainly based on the concept of pathogenesis. In recent years a new health promotion approach has been implemented. This change is based on the salutogenesis model developed by Antonovsky [1]. Instead of illness prevention this model focuses on enhancement of health and its resources. Health and individual behaviour are explicitly discussed in relation to complex social and ecological, life and environmental conditions. Hence, two intervention strategies become appropriate: *behaviour changes* accompanied by individual attitudes and competences; and *changes of life conditions.* The results of the German Health Interview and Examination Survey for Children and Adolescents (KIGGS) point to the significance of both strategies. Table 2 gives an overview of the realisation of interventions on several levels within the scope of these two strategies.

Table 1. Prevalence and projections of overweight/obesity in children and adolescents (in millions) in various regions of the world [22]

Region	Overweight and obesity	Obesity	Overweight/ obesity projected in 2010	Obesity projected in 2010
Europe (1992-2003)	25.5	5.4	38.2	10
America (South and North) (1988-2020)	27.7	9.6	46.4	15.2
South East Asia (1997-2002)	10.6	1.5	22.9	5.3
West Pacific (1993-2000)	12	2.3	27.2	7
Eastern Med. (1992-2001)	23.5	5.9	41.7	11.5

Table 2. Systematic manner of several intervention strategies and intervention levels of health promotion

		Intervention Level			
		Individual Conditions	Social Environment	Structural Conditions	Cultural Environment
Intervention strategy	Change of behaviour	Change of attitudes and competences	Social support and social pressure to change behaviour	Promoting and awarding individual health behaviour	Change of individual values
	Environmental changes	Implementation and improvement of health-promoting facilities	Health promotion as an important subject from childhood to adolescence	Change of public health policy	Change of social norms

POLAND

In the last decade a number of studies concerning the prevalence of overweight and obesity in adolescents have been carried out [6-8, 27]. Their results indicated overweight and obesity from a few to a few dozen percent of subjects. In a cross-sectional study Oblacińska and Jodkowska [33] observed that among the 13-15-year-olds 8.3% of boys and 9.2% of girls were overweight, and 3.3% of boys and 5.2% of girls were obese. In their research on overweight and obesity in Polish youth Mazur et al. [29] found that 8% of boys and 10% of girls were overweight, and 7% of boys and 10% of girls were obese.

Among the obese youth, 67.1% (71.9% of boys and 63.5% of girls) declared their participation in extracurricular PA for the average of 7 hours a week. In the group of normal-sized pupils it amounted to 76.8% (69.3% of boys and 78.4% of girls) of the examined school population, for the average of 8.5 hours a week. Almost 40% of the obese youth had one or both obese parents. Obesity resulted in acts of peer aggression in 35% of obese boys and 33% of obese girls [33].

These results indicate a regression of motor and functional abilities, which is related to poor participation in PA, but also to insufficient stimulation during physical education lessons [4]. In their study of teenagers Woynarowska et al. [46] used the MVPA (Moderate-to-Vigorous Physical Activity) index to assess their level of PA. A satisfactory result was 5 and above, which means at least 60 minutes of PA a day, for at least 5 days a week. 59% of boys and 71% of girls failed to achieve the satisfactory level. 24% of girls and 34% of boys spent more than 4 hours a day watching television on school days; 25% of boys and 8% of girls played computer games for more than 3 hours a day; and 16% of boys and 34% spent more than 3 hours a day doing homework. Also Oblacińska and Jodkowska [33] used the MVPA index in their study. Only 35% of overweight school students undertook the recommended amount of PA (38% of boys and 34% of girls). 37% of urban and 34% of rural adolescents achieved the satisfactory level of PA.

Among the various state health policies in Poland the leading program is the National Health Program 2006-2015. Its overall strategic aim is the improvement of health and life quality of the Polish population. The three program directions include: 1. Bridging the gaps in health and access to medical care; 2. Promotion of a healthy lifestyle; 3. Development of healthy living, working and learning environments.

Specific (selected) aims of the program include: 1. Reduction of the regional stratification of the health status. 2. Involvement of regional and national NGOs in health promotion. 3. Increase of PA. 4. Change of nutrition habits leading to a decrease of overweight. 5. Promotion of psychological well-being. 6. Improved infrastructure and more qualified health education staff.

In 1999 a reformed interdisciplinary course in health education was introduced into secondary school curricula in Poland. The course was supposed to be carried out by teachers of various subjects during their classes and coordinated by a specially designated teacher called the head of the course. The main activities of that interdisciplinary health education course included: meeting with parents, “green prescriptions” – guidelines for PA

recommended by physicians, population-wide fitness tests indexes, health plans for individuals (similar to business plans), transfer of life skills teaching and a "yellow ribbon" regular basic medical examination.

In 1991 Poland was included in the European network of health-education schools and the leading role in that process was undertaken by Woynarowska and her team [47]. The main concept behind the network of schools was based on health-education: 1. Health education as an integral part of the school curriculum. 2. Health ethos in school (integrated curricula). 3. Cooperation with parents and local community.

The framework was developed on the basis of two theoretical concepts: setting as a place of supporting local community, and empowering individual and social health potential. The strategy was based on setting development, an approach "from people to the problem and the involvement of local community".

SPAIN

The problem of youth obesity prompted the Spanish Ministry of Health and Consumer Affairs to draw up the Strategy for Nutrition, Physical Activity and the Prevention of Obesity (NAOS), which aims to improve the diet and encourage regular PA by all citizens, with a special emphasis on children. NAOS encompasses recommendations for action in four fields: family and community, schools, private sector, and the health system, and it is the first strategy of its kind in Europe. It can be taken as an example to be followed by countries that, like Spain, face the challenge of combating the pervasive epidemic of obesity [32].

Within NAOS, the PAOS Code (regulation of advertisements targeting young people concerning health and prevention of obesity) has also been developed. It is a sectorial code promoted by the F.I.A.B. (Federación de Industrias de Alimentos y Bebidas) with the aim of establishing rules for advertisements targeting children below 18 years of age. This strategy includes a pilot intervention program for children aged 6-10 years, called PERSEO, that will be developed in six different Regions (Comunidades Autónomas, CC.AA). Table 3 presents different plans and programs aimed at improving PA and nutrition in different regions of Spain.

Table 3. Health programs in different regions of Spain

Region	Health programs
Castilla la mancha	Health Education plan for schools promotion of healthy diet and regular physical activity
Regíón de Murcia	Health Educations Plans for School 2005-2010
Extremadura	The Nutrition Guide for Schools
La Rioja	Promoting healthy dietary habits. Information for parents
	Healthy cooking classes for secondary school students

DISCUSSION

The countries described above share the problem of youth overweight and obesity, even if the prevalence as well as the levels of PA are different. They have all organized different health programs on a national or regional level. Their duration and extent vary, and their discontinuity may have an impact on their overall effectiveness.

Table 4. Physical Education lesson time and Physical activity in girls and boys from different European countries [34, 46]

Country	PE (min)/week (13-16 years old)	% of pupils engaged in appropriate level of physical activity (5 days or more x 60 min/week)		
		Girls	Boys	Total
Poland	135	29	41	70
Germany	135/90 (varies in lands)	35	32	67
Spain	100	26	39	65
Austria	90	35	48	83
Czech Republic	90	36	50	86
Norway	90	–	–	–

Schools are places where the health policy can be carried out in many ways. The most significant one is to develop proper PA through school physical education. Teachers should motivate their pupils also to undertake extracurricular PA. It might be assumed that more P.E. classes per week will directly result in a higher level of PA and indirectly in undertaking more PA outside school. However, this is not so certain. A greater number of P.E. classes does not always mean a higher level of PA. Table 4 compares the number of P.E. classes and the level of PA. The data from the European studies have been obtained using the same methodology.

It is perhaps not the quantity of PE classes but the quality of physical education which has a decisive effect on health-oriented behaviour of young people. Pośpiech [34] in his analysis of European educational systems showed that secondary school students (12-16 years of age) were more critical in their assessment of physical education quality than primary school students.

CONCLUSION

International, national and regional health-promotion programs may influence the development of desired patterns of behaviour in children and adolescents, including their motor habits. The Health(a)ware project: *An experienced-based learning and teaching approach for physical and health education* is a great opportunity for introduction of such changes. Within Health(a)ware project different sport scientific institutions, associated secondary schools and non-school partners from Austria, Czech Republic, Germany, Norway, Poland and Spain have been working together towards a better understanding of health in youth. The concept of Health(a)ware aims at creation of modules for teacher training with a teaching material kit which enables teachers to initiate and carry out experimental health teaching within and across other school courses. Cross-curricular instruction of knowledge and skills may help students in the process of lifelong learning, and it may be implemented in the curriculum of European schools.

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