

SCHOOL-AGE CHILDREN AWARENESS OF THE CAUSES OF OBESITY AND ITS HEALTH RELATED OUTCOMES

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Abstract

Childhood obesity is a serious medical condition affecting children and adolescents that can be prevented by life style modification. Therefore, school-age children awareness of the causes of obesity and its health related outcomes is very important. Subjects Methods This work is a part of the complex project "Assessment of the current nutritional status, nutrition-related health problems in school-age children in Ukraine". The total number of participants is 392 school-age children who were grouped by the age: primary school (75 children aged 6–9), secondary school (202 children aged 10–14) and high school (115 children aged 15–18). Original questionnaire was elaborated for the survey, consisting of both multiple choice questions and "open questions" that encouraged children to give their own idea with the purpose of understanding a real awareness of the problem. Answers to the open questions about the causes and effects of obesity were assessed. Results One third of respondents regardless of age (primary school, – 29.31%, secondary school – 29.21%, high school – 33.04%, $p>0.05$) understood that obesity can cause serious health problems and the most detrimental changes can occur in the cardiovascular system. It was established that self-controlled situations were named as the main causatives of the obesity by more than half of surveyed children (53.33% of primary school, 53.46% of secondary school children and 41.74% high school children, $p>0.05$). We established that less than 10% of children were not aware of the causes of obesity and possible outcomes. Meantime, 30% of respondents were not prone to give any answer. Conclusions: Regardless of age school-children are aware of health-related problems caused by obesity. Special education programs are necessary for all school-age children with the purpose of developing the responsibility for the health in their adult life.

Key words: *Obesity, causes of overweight, school-age children, social education program.*

Introduction

Number of overweight people is about 2.1 billion around the world. It exceeds the amount of starving people by 2.5 times [1]. There is a tendency to an increase in obesity rate not only in adult, but in pediatric population as well. The incidence of pediatric obesity increased dramatically within one generation [2]. Thus, 42 billion of children under 5 years are overweight or obese [3].

The main feature of this epidemic is that it can be prevented by life style modification [4], that may well lead to the cardiovascular risk

reduction by the improvement of the metabolic parameters [5]. According to the WHO [4] and AHA [6], diet together with exercising are effective tools for the prevention of cardiovascular problems.

17.77% children in Ukraine are obese [7]. There is a tendency to the growing number of over non-medication interventions depends on different factors [9] but still is a treatment of choice of pediatric obesity [4].

Thus, study of school-age children awareness of the causes of obesity and its health related outcomes is crucial for the education programs.

2. Purposes, subjects and methods:

2.1 Purpose – to study school-age children awareness of the causes of obesity and its health related outcomes.

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2.2 Subjects & Methods

This work is a part of the research "Assessment of the current nutritional status, nutrition-related health problems in school-age children in Ukraine", conducted at Kharkiv National Medical University for the development and further implementation of social education program for prevention of non-communicable diseases.

A cross-sectoral study was conducted in three different geographic regions of Ukraine. The present data provides survey results of children in Kharkiv region (as a representative of eastern part of country).

Survey assessment of current nutritional status in school-age children of 3 age groups (aged 6–9, 10–14, 15–18), who were randomly selected in urban and rural areas of region, was performed.

The total number of participants was 392 school-age children who were grouped by the age.

The high school group (aged 15–17) consisted of 115 children aged 15.28 + 1.47 that included 29 (25.22%) boys and 86 (74.78%) girls.

The secondary school group (aged 10–14) consisted of 202 children aged 12.55 + 1.40 that included 95 (47.03%) boys and 102 (52.97%) girls.

The primary school group (aged 6–9) consisted of 75 children aged 8.20 + 1.27 that included 43 (57.33%) boys and 32 (42.67%) girls.

For the survey the original questionnaire (adapted according to the FAO recommendations) was elaborated for evaluation of broader context (economic, social, environmental factors) that influences nutrition. Questionnaire consists of both multiple choice questions and "open questions" that encouraged children to give their own idea with the purpose of understanding real awareness of the problem. Survey was conducted in the comfortable atmosphere with no pressure from peers, parents or tutors.

Results of the provided data concerning causes and outcomes of obesity were grouped by the self-control (self-controlled, uncontrolled), affected body system and health risk.

Self-controlled causes include such answers as "wrong nutrition", "sedentary lifestyle", "continuous consumption of food", "increased appetite to the tasty food", "habitual eating", "consumption of bakery products", "consumption of sweets", "tasty food", "don't understand that it's a problem", etc.). Uncontrolled causes include such answers as: "stress", "hormonal problems", "diseases", "heredity", "metabolic problems" etc.).

Potential outcomes of obesity were grouped by the body systems.

- Cardiovascular problems: "myocardial infarction", "high blood pressure", "blocked vessels", "tachycardia", "stroke", "heart problems", etc.

- Orthopedic problems: "pain in legs", "difficulty in walking", "joint pain", "posture problems", etc.

- Gastrointestinal problems: "liver disorders", "stomachache", "nausea", "abdominal pain", "digestion problems"

- Endocrine problems: "high blood sugar", "diabetes", "infertility", etc.

- General well-being problems: "weakness", "tiredness", "poor sleeping", "headaches", "depression", etc.)

Potential outcomes of obesity were grouped by the health risk:

- Death or disability associated: "premature death", "myocardial infarction", "stroke", "tumors", etc.

- Chronic diseases: "diabetes", "joint problems", "dyspnea", "liver disorders", "digestion problems", "heart diseases"

- General well-being problems: "weakness", "tiredness", "poor sleeping", "headaches", "depression", etc.)

The study was approved by the institutional Committee in Ethics and Bioethics of Kharkiv National Medical University. Written consent from parents and children was obtained for every participant.

Standard statistics was used for the data analysis.

Conflict of interests. There is no conflict of interests.

3. Results and discussion

Children in all groups have chosen self-controlled causes of obesity as the most significant (53.33% of primary school, 53.46% of secondary school children and 41.74% high school children).

Number of children who do not know the answer to this question is growing from primary to secondary and declining from secondary to high school age. The number of those who did not respond was statistically higher in high-school group (*table 1*). This might be suggestive for the substitution of the problem by the non-primary school children whereas they are able to understand the real causes. On the other hand this tendency could be a feature of teenager's behavior.

Recent studies show that more than 60% of children are aware of childhood obesity and about 40% know that overeating, decreased outdoor play, spending more time in front of screen (TV, mobile, and laptop) can contribute to it [10]. 75% of parents in this study to 85% of obese children's parents are informed about causes of the

Table 1

Number of children who did not know the answer or did not respond to the question concerning causes of overweight (% of respondents)

Age group	"I do not know" answer	No answer
Primary school, n=75	2.67	34.67
Secondary school, n=202	12.38	24.75
High school, n=115	4.35	40.87
Difference	$P_{13} = 0.01$ $P_{23} = 0.01$	$P_{23} = 0.002$

excessive weight, meantime they do not practice this knowledge in parenting their children [11]. It is worth mentioning that the vast majority of them originate from the socioeconomic level. This could be suggestive for the pure family control. Moreover, we have our own data that reflect pure life style control in families with overweight children in forms of episodes of hyper-dominant behavior and complete neglecting of the problem [8]. On the other hand, school-age children are able to keep

Just 5-8% of respondents are able to see probable link between excessive weight and orthopedic problems (primary school – 8%, secondary school – 7.43%, high school – 5.22%, $p > 0.05$).

Number of those who did not know the answer did not differ in groups. Whereas, about quarter of respondents regardless of age were not prone to answer the question about the body system most affected by overweight (table 2).

Table 2

Number of school-age children who did not respond and were unaware of body systems potentially affected by overweight (% of respondents)

Age group	"I do not know" answer	No answer
Primary school, n=75	4	34.68
Secondary school, n=202	8.91	24.75
High school, n=115	4.35	25.22
Difference	> 0.05	> 0.05

recommendations on the diet and develop appropriate food priorities [12]. Thus, it is necessary to develop programs for the education of children with no direct involvement of family members due to potential low compliance.

The cornerstone of any educational program is motivation that could be raised by the appreciation of potential outcomes of the problem [13]. Our comparative analysis of the awareness concerning outcomes of overweight demonstrates that children may well understand potential problems, associated with different parts of the body. Meanwhile, the third part of respondents despite of age (primary school, – 29.31%, secondary school – 29.21%, high school – 33.04%, $p > 0.05$) consider cardiovascular problems as the most significant. It is an important issue as according to our studies, even overweight and metabolically healthy children are under the risk of cardiovascular problems [14].

About 10% of population associate obesity with decreased well-being (primary school – 12%, secondary school – 10.89%, high school – 13.91%, $p > 0.05$). And the same amount – with GIT disorders (primary school – 10.67%, secondary school – 13.87%, high school – 12.17%, $p > 0.05$).

Answers of children to the question about overweight outcomes were grouped by the degree of risk for the health and life. We have revealed that children in all age groups understand the link between obesity and acute cardiovascular events, diabetes and cancer (primary school – 20%, secondary school – 28.71%, high school – 29.57%, $p > 0.05$). They also understand that excessive body mass can cause general weakness, tiredness, sleep disorders and headache (primary school – 20%, secondary school – 15.35%, high school – 12.7%, $p > 0.05$). This findings suggest appropriate awareness of the problem which is greater than in other middle-income countries [10, 11, 16]. Simultaneously, the number of unreplied subjects varies from 20 to 40% that is really significant and attracts a particular attention.

Conclusions

1. School-age children understand that obesity can cause problems with a general well-being, leading to the chronic diseases, disability and even death. Regardless of age children consider that the most detrimental changes can occur in the cardiovascular system (primary school – 29.31%,

secondary school – 29.21%, high school – 33.04%, $p > 0.05$).

2. Self-controlled situations (wrong nutrition, sedentary life style, etc.) were named as the main causatives of obesity by more than half children regardless of age (primary school – 53.33%, secondary school – 53.46%, high school – 41.74%).

3. The number of children who are not aware of obesity causes and potential outcomes is less than 10%. Whereas about 30% of respondents were not prone to give an answer that is suggestive for the psychological substitution of the problem. Thus, education is necessary for all school-age children with the purpose of developing the responsibility for health in their adult life.

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