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PERCENTAGE OF OVERWEIGHT CHILDREN UNDER 5 YEAR: SURVEY DATA ANALYSIS ON THE EXAMPLE OF ALMATY CITY

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Abstract: The prevalence of obesity among children has increased last years, and there are many reasons causes for this tendency. We examined the parents by survey to determine the reasons of obesity at the age of less than 5 years. We did survey data analysis based on parents' answers to our survey and found some factors to cause obesity of children. As the standards of weight and height of children, we considered Weight-for-Height Standards of World Health Organization.

Keywords: Obesity, BMI, Children, Childhood Obesity, survey data analysis

5 ЖАСҚА ДЕЙІНГІ БАЛАЛАР АРАСЫНДАҒЫ АРТЫҚ САЛМАҚ МӘСЕЛЕСІН ЗЕРТТЕУ: АЛМАТЫ ҚАЛАСЫНЫҢ МЫСАЛЫНДА МӘЛІМЕТТЕРДІ ТАЛДАУ

Аңдатпа: Балалар арасында артық салмақтың таралуы соңғы жылдары өсті және осы тенденцияның себептері көп. Біз 5 жасқа дейінгі балалардағы артық салмақтың себебін анықтау үшін ата-аналарға сауалнама жүргіздік. Бұл сауалнамаға ата-аналардың жауаптарына негізделген деректердің барысында талдау жүргіздік. Сонымен бірге балаларды артық салмаққа алып келетін кейбір факторларды зерттеп, себебін табуға тырыстық.

Ал осы балалардың салмағы мен бойының стандарттары ретінде біз Бүкіләлемдік денсаулық сақтау ұйымының стандарттарын қарастырдық.

Түйінді сөздер: дене салмағының индексі, балалар, артық салмақ, сауалнама деректерін талдау

ДОЛЯ ДЕТЕЙ С ИЗБЫТОЧНЫМ ВЕСОМ В ВОЗРАСТЕ ДО 5 ЛЕТ: АНАЛИЗ ДАННЫХ ИССЛЕДОВАНИЯ НА ПРИМЕРЕ ГОРОДА АЛМАТЫ

Аннотация: Распространенность ожирения среди детей возросла в последние годы, и есть много причин, вызывающих эту тенденцию. Проведено обследование родителей путем опроса, чтобы определить причины ожирения в возрасте менее 5 лет. Проведен анализ данных на основе ответов родителей на опрос и обнаружены некоторые факторы, вызывающие ожирение у детей. В качестве стандартов веса и роста детей рассматривались стандарты веса для роста Всемирной организации здравоохранения.

Ключевые слова: избыточный вес, ожирение, индекс массы тела, дети, детское ожирение, анализ данных опроса

INTRODUCTION

Overweight and obesity are pathological or excessive fat accumulation, representing a health risk. For example, using the method of measuring body mass index (BMI) - weight of a person (in kilograms). It is usually considered that a person with a BMI equal to or greater than 30 is a person with a BMI equal to or greater than 25, is overweight.

Overweight and obesity are major risk factors for a variety of diseases, including diabetes, cardiovascular diseases and cancer. Currently, the problem of overweight and obesity, which was previously considered typical only for high-income countries, is becoming widespread in low- and middle-income countries, especially in urban settings.

To date, there is no consensus in the world regarding which approaches and which combinations of health measures will be most effective in preventing childhood obesity in different conditions and different communities. The High-Level Commission on the Elimination of Childhood Obesity is tasked with systematizing the expert opinions of specialists from around the world and proposing recommendations to the WHO Director-General for resolving the current crisis.

No scientific discipline alone can provide a foundation for developing a strategic approach to solving the problem of childhood obesity. Specialists in sociology, public health, clinical research and economics will join forces to develop a consistent plan based on reliable evidence. They will be joined by interested parties from the following areas: maternal and child health and nutrition; health education and awareness; physical education; public policy.

Obesity in children and adolescents is one of the urgent problems of modern health care. Practically all over the world, the number of sick children is steadily growing and doubles every three decades [6]. In the United States in 1976-1980, between the ages of 6 and 11, 7% were obese, and from 12 to 19 years, 5% of children. By the end of the millennium in both age groups, the prevalence of obesity already exceeded 15% [5]. Even in Japan, where still relatively recently, overweight people were relatively rare, the incidence of obesity

among schoolchildren 6-14 years old in 1993 was 10%. Currently, in developed countries, up to 25% of adolescents are overweight, and 15% are obese. In the Russian Federation, 5.5% of children living in rural areas and 8.5% in urban areas are obese.

Of great interest is the problem of the connection of obesity in childhood with obesity in the same patients who have become adults. It is estimated that 30-50% of these children retain this disease in the adult period of life. Thus, in the British prospective study, it was shown that of girls whose preschool age was within the 91-95th percentile, by 33 years, 33% had obesity; with the body mass in childhood within the 95-98th percentile - in 44%, and with the body mass over the 98th percentile in childhood by 33 years, obesity persisted in 60% of cases. On the other hand, in the study it was revealed that, of the group of 33-year-olds with a BMI of 25-30, 63% of men and 43% of women were overweight at school age [7]. Among adults with bulimia, childhood obesity was 40%, and among healthy adults it was observed in childhood only in 15%.

Almost all studies have shown that the prevalence of obesity is higher among girls. It is revealed that BMI in 33-year-old women rises linearly with a decrease in their menarche age. So, girls with the onset of menarche up to 11 years old at 33 years old have an average BMI of 26.6, and from the menarche age of 15 years have a BMI of 22.5. It is assumed that the low social level in families among girls is associated with obesity to a greater extent than among boys.

LITERATURE REVIEW

By 2022, more children and adolescents will suffer from obesity than from underweight.

Over the past four decades, the world has become ten times more children and adolescents (from five to 19 years old) suffering from obesity. If the current trend continues, by 2022 the number of children and adolescents with obesity will exceed the number of their peers with moderately or significantly underweight. Such a conclusion is made in a new study conducted by the Imperial College in London and the World Health Organization (WHO).

The results of the study were published in the journal *Lancet* on the eve of World Obesity Day (October 11). The study analyzed the body mass and height of almost 130 million people older than five years (31.5 million people aged 5-19 years and 97.4 million - from 20 years and older), this is the largest number of people or participating in an epidemiological study. More than 1000 co-authors contributed to the study, helping to track the values of body mass index (BMI) and the dynamics of obesity throughout the world from 1975 to 2016.

The rates of childhood and adolescent obesity worldwide increased from less than 1% (corresponding to five million girls and six million boys) in 1975 to almost 6% among girls (50 million) and almost 8% among boys (74 million) in 2016. The total number of obese people aged 5-19 years has grown globally more than 10 times, from 11 million in 1975 to 124 million in 2016. Another 213 million in 2016 were overweight, which, however, was less than the threshold value for obesity.

STANDARDS AND KEY FACTS

Key facts

- The number of infants and young children (from 0 to 5 years old) who are overweight or obese has increased worldwide from 32 million in 1990 to 41 million in 2016. In the WHO African Region alone, the number of children who are overweight or obese has increased from 4 million to 9 million over the same period.

- In emerging economies (the World Bank

classifies them as low- and middle-income countries), the incidence of overweight and obesity among children is 30% higher than in developed countries.

- If this trend continues, the number of overweight infants and young children will increase to 70 million by 2025.

- Unless action is taken, these infants and young children will continue to be obese in childhood, adolescence, and adulthood.

- Obesity in childhood causes a wide range of serious complications and an increased risk of early development of diabetes, cardiovascular and other diseases.

- Exclusive breastfeeding from birth to 6 months is an important way to prevent obesity in infants.

The effects of childhood obesity

Obese children are more susceptible to various health problems in adulthood, such as:

- cardiovascular diseases;
- insulin resistance (often an early sign of soon developing diabetes);
- disorders of the musculoskeletal system (especially osteoarthritis, an extremely disabling degenerative disease of the joints);
- some oncological diseases (intrauterine devices, mammary glands, colon);
- disability.

Standards. Children under 5 years old

In children under 5 years of age, overweight and obesity are defined as follows:

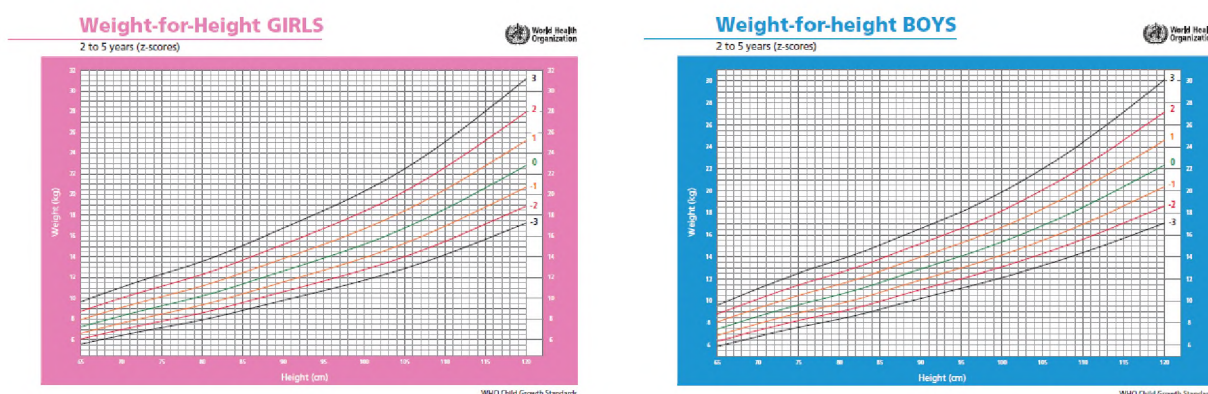


Figure 1 – Weight for Height of girls and boys at the age of 2 to 5 years (z-scores)

overweight - if the ratio “body weight / height” exceeds the median value specified in the Standard Indicators of Physical Development of Children (WHO), by more than two standard deviations;

obesity - if the ratio “body weight / height” exceeds the median value specified in the Standard Indicators of Physical Development of Children (WHO), by more than three standard deviations;

Figure 1 illustrates obesity standards of boys and girls at the age of 2 to 5 years [1].

SURVEY DATA ANALYSIS

During the primary analysis and literature review, decided to perform local survey in Almaty for over 1000 families, with children under 5 years old.

The option identified as best meeting the multiple aims of sample representation, data quality, timeliness, and cost is to conduct the 5 years old children weight through use of supplemental questions following the Survey for those sample persons identified as meeting or having 5 year old children in the families. People have been asked about the average family income, area of living, quantity of people living together, frequency of meals and the quality of food contributed by children. Given potential issues with the problems of children obesity asked from respondents associated children height and weight. The team of IITU data processing

course students and mentors have performed the research on survey questions and plan to increase the quality of output data.

According to research results, the plan of survey have been designed and tested. For the test of the survey several groups of people who differs according to age, salary, martial and family statuses were chosen. Overall the 50 people took action during the survey test phase. The results of it is attached.

According to Figure 2, the most dangerous area for children obesity due to inactive way of life are the families where average parents or responsible person age is between 25-30 years and 45-50 years. The data shows that these groups of people are less inclined to provide enough activity for their children or dependents.

Figure 3 displays that the children with less active hours spend are more vulnerable to have overweight problems. Weather at least usual activity fewer the possibility of it.

Hereinafter, we can see that most of children with lower activity rate are already have overweight and obesity problems, weather other children are in the range of normal weight.

On the Figure 4 the distribution of answers for the simulation is shown. The simulation: “Imagine the child of 5 years with height of 109 cm. What is the healthy weight for such child?”. According to health standards, the healthy weight for this height is below 19 kg. From the diagram

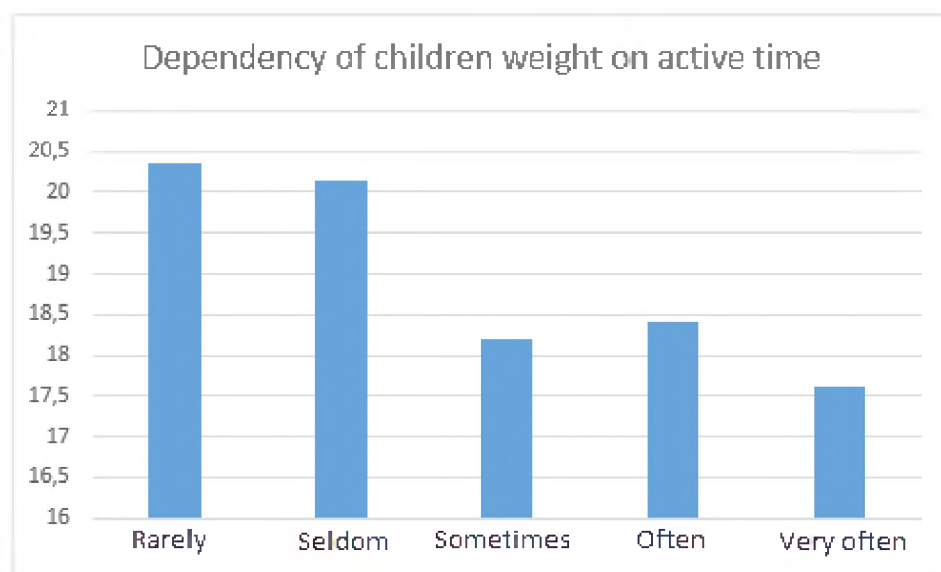


Figure 2 – Dependency of children weight on active time

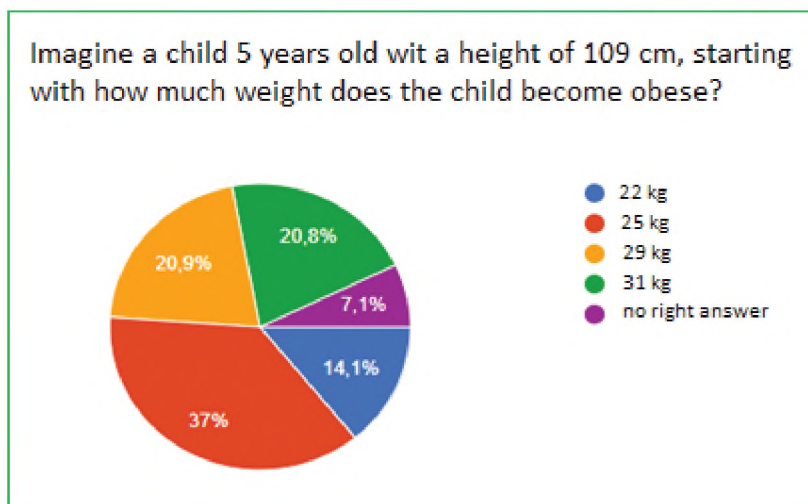


Figure 3 – The test for people about knowledge about overweight and obesity

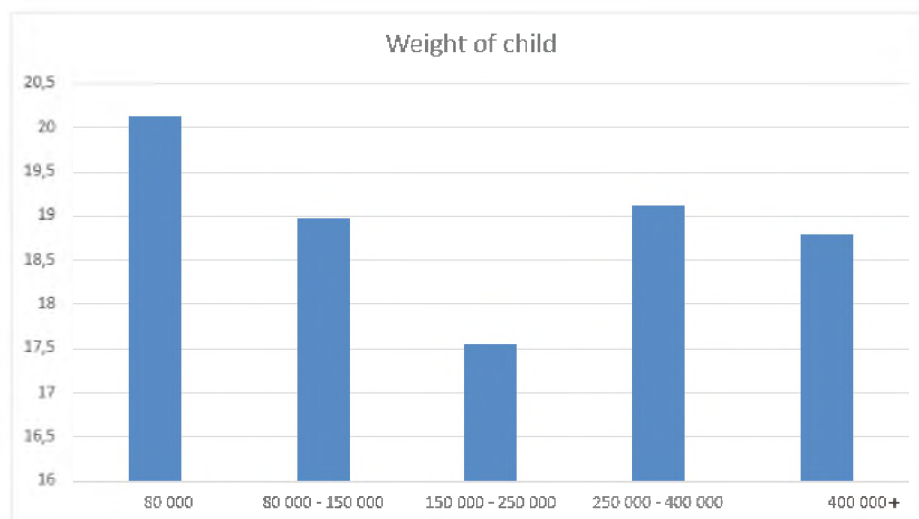


Figure 4 – Dependency of children weight on average family income

3 we know that only 7% of 1526 respondents, could correctly answer for the question. Unfortunately most of respondents think that 25 and higher weight is normal for children, which is already an indicator of overweight and high risk of obesity.

Figure 5 present us that the families with monthly income below 80000 are more trendy to have children with overweight symptoms. For the groups whose average monthly income in the range of 80000-150000 tg and 250000 and above, the average weight of children are within the norms of healthy weight. For the families with average monthly income of 150000-250000 tg, children are tend to have less weight in comparison to other groups. This may indicate the possibility of famine in the group, but requires

additional investigation.

Figure 6 displays that the children who tend to have more frequent snack are more predisposition to have overweight and obesity. Children who used to have snack with middle frequency have less weight in comparison with the children who are not having snacks at all.

CONCLUSION

Assuming the data provided, collected and analyzed the project gives us information that about 10% of children have overweight and symptoms of obesity. The vast majority of people are not informed about the obesity and children's healthy weight. In addition, we know that about 98% of all population above 20 years have access to the internet, social networks and actively use

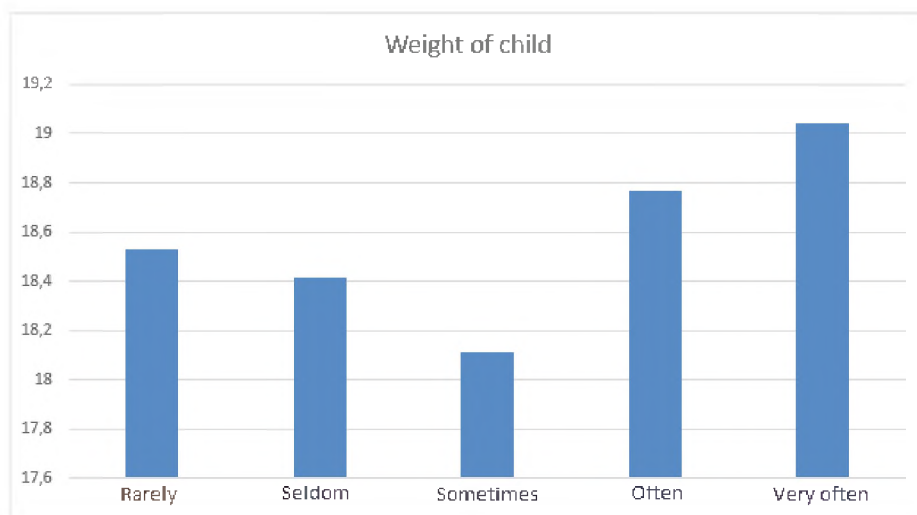


Figure 5 – Dependency of children weight on frequency of snacks

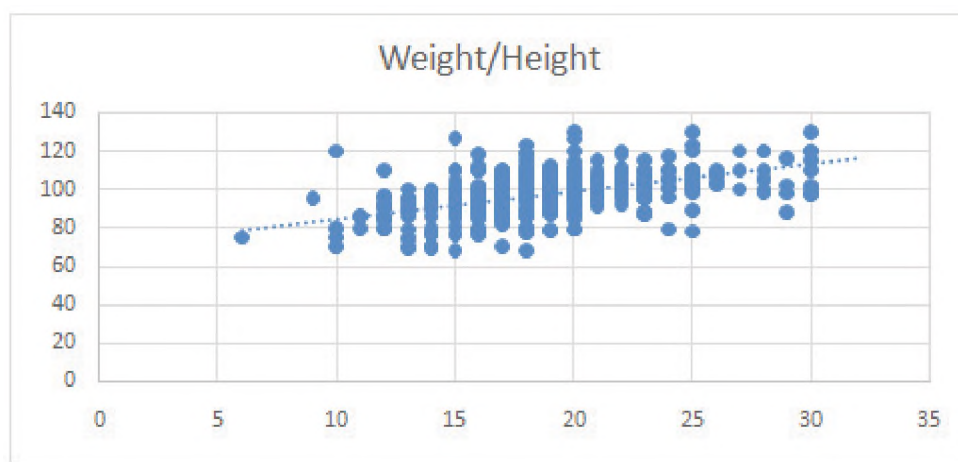


Figure 6 – Children weight and height distribution

them. Using regression model to predict whether the average weight would normalize if parents or responsible person would know the information provided, with 87% accuracy the children's average weight would lessen.

Concluding above information, we could provide the people with the information about children obesity and the ways to treat it and prevent using social networks and the internet.

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