PREVENTION OF OBESITY ON PRIMARY, SECONDARY AND TERTIARY LEVELS OF CHILDREN'S HEALTH CARE

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XIV. Congress ISGA 2017, Buenos Aires, Argentina
Slovenia
Maribor
is the second largest city in Slovenia
area: 147.5 km²
Weather: 20°C, Wind SW at 11 km/h
35% humidity; 270 m altitude
The hospital employs approximately 2800 staff members, 450 of whom are physicians and 1300 healthcare workers.

The hospital is a 1266-bed facility. Approximately 60,000 patients are treated annually. More than 390,000 outpatients are treated at 270 different outpatient clinics.
Obesity

- Obesity and complications of obesity in children and adolescents are one of the most important public health problems of the Republic of Slovenia.

- The National Institute of Public Health formed a Working Group where experts from various fields played an important role in the problem (doctors-pediatricians from all levels of treatment, nutritionists, psychologists, kinesiologists, IT professionals).

- A common denominator of the measures envisaged is that the healthcare system necessarily needs a digitized platform for the implementation of a successful preventive programs (1).


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Parallel to the setting up of a digital platform, it is also necessary to establish and adequately support (financially and HR) for multidisciplinary teams, which will treat children and adolescents with obesity and complications at the primary and secondary levels equally, and implement preventive programs of a healthy lifestyle.

It is also essential to endorse (financially and HR) the multidisciplinary teams, which at secondary and tertiary level already address and treat children and adolescents with obesity, since the professional treatment of these children has progressed significantly in recent years.
Definition

For the statistical purposes of monitoring the prevalence of over-nutrition, it is advised to use

- BMI > 85th percentile for excessive nutrition (overweight) and /
- BMI > 95th percentile for obesity or criteria of IOTF.

For the purpose of clinical definition of children / adolescents who have an increased likelihood of developing complications of obesity, BMI > 91 percent of excessive nutrition and over 98 percentile (with z>2) for obesity and severe obesity (2).


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**Definition II**

- **Excessive nutrition (overweight):**
  - BMI 85 - 95.9 kg/m²

- **Obesity:**
  - BMI > 95.9 kg/m²

- **Severe obesity:**
  - BMI > 99.9 kg/m²
  - BMI z > 2

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## Trends of obesity in Slovenia - pre-school girls and boys

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### Trends of obesity in Slovenia - school girls and boys

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<tr>
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<th>2004</th>
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<td><strong>Overweight girls</strong></td>
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<td>Overweight girls</td>
<td>239/1.363</td>
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Primary prevention

- The family, kindergarten, school, local community, pediatric health service, media, sports associations, civil associations are included.
- Measures should be implemented at all levels and in different environments.
- Measures should cover the local, national and international levels. By doing so, individuals should be encouraged to take responsibility for actively exploiting the opportunities offered.
Slovenian guidelines for systematic preventive examination including guidelines for prevention of obesity and supported healthy lifestyle of children and youth.
Evropska deklaracija o preprečevanju dobelosti

Z namenom, da se lotimo obravnave vse večjega izziva, ki ga epidemicija dobelosti predstavlja tako za zdravje kakor tudi za gospodarstvo in razvoj, ministerji in delegati, udeleženci Evropske ministerjeve konference SZO o preprečevanju dobelosti (Istanbul, Turčija, od 15-17. 11. 2006), skupaj z regionalnimi direktorjem Urada za Evropo pri SZO, v navzočnosti evropskega komisarja za zdravje in varstvo potrošnikov, sprejemamo naslednjo evropsko deklaracijo o preprečevanju dobelosti. Pri pripravi te deklaracije so v razpravah in posvetovanjih sodelovali različni vladni sektori, mednarodne organizacije, strokovnjaki, civilna družba in zasebni sektor.

SUPPLEMENT ARTICLE

Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity: Summary Report

Sarah E. Barlow, MD, MPH and the Expert Committee

Division of Pediatric Gastroenterology, Nutrition, and Hepatology, Department of Pediatrics, Baylor College of Medicine, Texas Children’s Hospital, Houston, Texas

The author has indicated she has no financial relationships relevant to this article to disclose.

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Secondary prevention

- After defining obesity with BMI > 85 and < 95 and / or > 95 without co-morbid signs, involve a child / adolescent pediatrician and his family in an outpatient treatment programme for obesity.

- The pediatrician and nurse devote themselves to education and explanation of the disease, the importance of necessary changes in nutrition and physical activity, and prepare together with the family a plan of treatment.

- The goal is to reduce body weight or at least maintain the same weight to the achieved target weight, which should be below <85 pc for age and sex (3).

Tertiary prevention

- Dietetics, psychologists, kinesiotherapists/sports pedagogues, informatics are involved in the treatment.

- Comprises activities and measures to prevent progression of metabolic diseases and obesity (glucose metabolism (diabetes typ 2, hyperinsulinism), menstrual cycle disorder and / or overeating, hyperlipidemia (total cholesterol above 5.0 mmol / l ), hypertension, fatty liver infiltration, respiratory disorders, sleep disorders, orthopedic complications).
Comorbid diseases of obesity

**Pulmonary**
- Obstructive sleep apnea
- Asthma
- Exercise intolerance

**Endocrine**
- Insulin resistance
- PCOS
- Pubertal advancement

**GI/nutrition**
- Fatty liver disease
- Gastroesophageal reflux
- Cholelithiasis
- Iron deficiency
- Vitamin D deficiency

**Cardiovascular**
- Elevated blood pressure
- Dyslipidemia
- Atherosclerosis
- Chronic inflammation
- Congestive heart failure

**Renal**
- Hyperfiltration
- Glomerulopathy

**Orthopedic**
- Lower limb malalignment
- SCFE
- Osteoarthritis

**CNS/psychosocial**
- Pseudotumor cerebri
- Decreased quality of life

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School for Healthy Nutrition and Lifestyle

- We use the School for Healthy Nutrition and Lifestyle, which covers the holistic treatment of children with obesity and comorbid diseases within the family and its wider surroundings.

- The school is run by psychologists, biopsychologists, dietitians, nurses, sports pedagogues, kinesiotherapists and informatics.
Camp Method for Treatment Obesity With Comorbidity

- We use the Camp method (4), which means that the children find themselves in therapy camps in a youth camp, separated from their families for 10-14 days, and learn how to plan a diary, exercise, and organize a daily schedule.

- Later, parents are also involved in education.

Electronic devices we help with for following the changes of body weight and physical activity

- Pedometers
- USB diagnostic Bluetooth scales
- Tablets
The making of the informatic system

- The Institute of Jozef Stefan, University of Ljubljana
- Apps for mobile phones, tablets and personal computers
- The connection of pedometers and wireless scales with computers and mobile phones
- The making of online platform/website for:
  - The therapists - electronic material, monitoring, control check-ups
  - Parents - daily instructions and advising
  - Children - in the shape of collecting healthy coins or points for achieving goals
- Frequent monitoring
- Evaluation
In a summer camp, where children usually go on organized vacation, is integrated the therapeutische team with special programme and children with obesity and comorbid diseases.
Educating and therapistic team

- psychologists,
- biopsychologists,
- dieticians,
- nurses,
- sports pedagogues,
- kinesiotherapists and
- informatics.

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The daily programme and activities are presented every morning:

- Kinesiotherapist’s part
- Psychologist’s part
- Nutritious-diety part
- Medical part
- Informatic and technologic part
- Fun and entertainment in the camp
Kinesiotherapeutic educational programme
Our results after treatment at the School for healthy eating and lifestyle, VIRC Poreč 2017

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After the school: Healthy points

Once per week therapists with parents and their children accomplish recreative goals.
Second phase of the School for Healthy Nutrition and lifestyle - Miloš Zidanšek - Pohorje 2016

- Therapeutic team prepares a three-day restoration school
- Parents and professional cooks are cooperating
- Analysis of two months work
- Teaching course of cooking for parents
- Conversations with the psychologist
- Recreation with kinesiotherapists
- Discussion about electronic data
Second phase of the School for Healthy Nutrition and lifestyle - Miloš Zidanšek - Pohorje 2016
Second phase of the School for Healthy Nutrition and lifestyle - Miloš Zidanšek - Pohorje 2016
The third phase: continuing of the preventing treatment at home with controlled check-ups and electronic following

- Follow-up in intensive outpatient and telemedicine monitoring of children (digital scales, pedometers, smart clocks and special applications on phones and tablets) over the next 6 months and a repeating school.

- The entire duration of the program is 2 years. The aim is to reduce body weight below 85 percent for age and sex and to improve laboratory and psychological health indicators (5).

Controlled check-ups every two months

- Psychologist
- Dietician
- Kinesiotherapist
- Nurse

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Conclusion

- We are introducing new methods of the approach to tertiary prevention of obesity: multitherapeutic team approach, education of children and families, Internet technology, continuous monitoring => early and on-going action).

- We need additional methods for detecting risk factors for co-morbid diseases in BMI with $z > 2$ (visceral fat measurement with Us, 3D body scanning, measurement of body compartments, ?).

- We use the telemedicine method of monitoring body weight (body pressure, . . .) with the help of informative technology.

- We want to influence the lifestyle of the family with obese children through behavioral cognitive therapy.

- We want to prevent and reduce co-morbidity.

- By reducing body weight ($\text{BMI} < 85\text{ pc}$) and changing the family's lifestyle to improve the child's health indicators.
And now?

Which method will prove to be for children:

reliable,
acceptable,
easy accurate

for the early detection, identification and monitoring of risk factors for obesity, co-morbidity clients diseases and metabolic syndrome

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Growth of visceral fat, subcutaneous abdominal fat, and total body fat in children. 

A technique for the measurement of visceral fat by ultrasonography: comparison of measurements by ultrasonography and computed tomography. 

Ultrasound measurements of intraabdominal fat estimate the metabolic syndrome better than do measurements of waist circumference. 
Ronald P Stolk, Rudy Meijer, Willem PTM Mali, Diederick E Grobbee, Yolanda van der Graaf

Methods for antropometric analysis of 3D Body Scanner data. 
Christian Lovato: Graduate School of Sciences Engineering Medicine Ph.D. Program in Multimodal Imaging in Biomedicine, Verona.

Body Volume Index: the body volume of the body parts and body composition can be analysed. This allows BVI to differentiate between people with the same Body Mass Index (BMI) rating.

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Thank you for your attention!
Thanks for the opportunity that we organized XIII. International Congress of Human Growth and Clinical Auxology 2014 in Maribor, Slovenia