

data show an association between the abdominal fat distribution in early life and at 2 years in boys with exclusive FF.

#### P1-P119

### Telemedicine Therapy for Overweight Adolescents: First Results of a Novel Smartphone App Intervention Using a Behavioural Health Platform

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**Introduction:** Despite improved therapy measures since 2014 the prevalence of overweight and obesity in Swiss adolescence stabilized on 19%. Particular challenges are lack of adherence to therapy in youth who are in difficult life situations or live further from specified centres. Therefore it is essential to find simple and novel therapeutic approaches. But although the number of digital based health information systems increases steadily, the effectiveness in reaching long term health goals or life style change mostly remain unproven. The aim is to test a novel design of a health app for overweight adolescents, whether it supports their motivation to participate in a lifestyle intervention including relaxation and activity exercises. **Methods:** Based on an open source platform with a text-based healthcare chatbot (THCB), a mobile chat app with a serious game character was designed for Android smartphones. Patients were able to chat with the THCBs Anna or Lukas with the help of pre-defined answer options. Direct communication between patients and health professionals (HP) was also enabled via a second chat channel. Sensor integration provided measurement of physical activity. In a 12-month randomized controlled study, the THCBs encourage patients to achieve daily challenges during 24 weeks (steps per day, breathing exercises, photos of nutrition and home environment, questions on well-being and eating habits) to earn virtual rewards. Effects on therapy adhesion during the 5.5-month intensive phase of intervention with 4 on-site visits will be compared to a treatment-as-usual group with monthly visits. **Results:** At start, in 22 patients (39% girls) age and BMI-SDS were not significantly different: 14.2 years (11.9–17) and 2.56 SD (1.7–3.5). At 5.5 months (13 THCB; 7 controls), almost 67% of the patients had >4 THCB conversational turns per day and 43% fulfilled daily challenges completely and successfully. Only during the first month, open chat questions, mainly on technical issues, took place in 3.4% of roughly 18.064 conversational turns. **Conclusion:** Interim analysis of the THCB intervention group of an ongoing RCT shows a high compliance with the app services over half a

year. This may be explained by the rewarding game system, the peer character of the THCBs and the perceived usefulness of the THCBs on the smartphone, a familiar medium for adolescents.

#### P1-P120

### Cardiorespiratory Fitness Effectiveness is Related to Abdominal Adiposity and Insulin Sensitivity in Overweight Adolescents

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The main pitfall of weight management programs is effective and safe fitness regimen choice. According to HELENA Study (2013) physical activity readiness is negatively correlated with markers of insulin resistance (IR) and central adiposity in adolescent population. Meanwhile, very little is known about cardiorespiratory fitness effectiveness in relation to hepatic, peripheral and whole body insulin sensitivity (IS). **Methods:** 64 adolescents aged 13.56±2.47 y.o. with different BMI were examined. Waist-to-height-ratio (WHR) used to know the degree of abdominal adiposity. Laboratory assessment of metabolic profile included fasting glucose (mmol/l) and insulin (μIU/ml) followed by standard multistage cycling procedure (Bruce protocol) with subsequent glucose and insulin measurement. Fasting insulin sensitivity assessed by HOMA-IR, peripheral IS – by ISI<sub>0,120</sub>, whole body IS – by Matsuda index. Cardiorespiratory fitness effectiveness determined by the % of Predicted VO<sub>2</sub> max, which used for grouping: Gr.1 – 120-80%, Gr.2 – 50-80%, Gr.3 – less than 50%. Standard statistical methods were used for the data analysis by SPSS soft. **Results:** O<sub>2</sub> consumption normalized to the lean body mass reflects progressive reduction of actual parameter (Gr.1 – 0.069±0.03; Gr.2 – 0.051±0.033; Gr.3 – 0.025±0.049; P<sub>12</sub>=0.04; P<sub>23</sub>=0.14; P<sub>13</sub>=0.002). Energy costs of physical activity (by MET) is greater in effective VO<sub>2</sub> uptake (Gr.1 – 14.59±3.05; Gr.2 – 9.99±3.038; Gr.3 – 5.66±2.46 kcal/min; P<sub>12</sub>, P<sub>23</sub>, P<sub>13</sub> <0.01). There was gradual decrease of Predicted VO<sub>2</sub> max with growing WHR (Gr.1 – 0.49±0.149; Gr.2 – 0.502±0.147; Gr.3 – 0.640±0.208; P<sub>12</sub>=0.825; P<sub>23</sub>=0.039; P<sub>13</sub>=0.019), but BMI and height of patients were not different in groups. There was no significant difference in blood glucose concentration after the exercise boost. Meanwhile insulin level twice as little in subjects, who successfully achieved predicted VO<sub>2</sub> (Gr.1 – 30.139±19.676; Gr.2 – 32.910±24.212; Gr.3 – 52.260±41.653 μIU/ml; P<sub>12</sub>=0.651; P<sub>23</sub>=0.107; P<sub>13</sub>=0.028). Group with lowest O<sub>2</sub> consumption was characterized by higher insulin resistance for fasting (HOMA-IR=5.62±3.11 vs 8.93±5.03, P<sub>13</sub><0.02), lower total body insulin sensitivity (Matsuda index=4.39±1.75 vs 3.00±1.65, P<sub>13</sub>=0.03) and deficient glucose metabolic clearance with relevant peripheral insulin sensitivity (ISI<sub>0,120</sub>= Gr.1 – 55.97±12.91; Gr.2 – 48.81±9.64; Gr.3 – 39.39±7.16; P<sub>12</sub>, P<sub>23</sub>, P<sub>13</sub><0.01). **Conclusion:** Exercise effectiveness in overweight adolescents is related to the abdominal adiposity and highly dependent on peripheral insulin sensitivity. Higher insulin concentration after the exercise boost associated with impaired energy expenditures better than glucose level on its own.