INTRODUCTION: Combined intervention programs on cardiovascular prevention and fitness in obese adolescents may induce a significant weight, body mass index (BMI) and fat reduction, increased physical fitness, self-esteem and self-confidence [1, 2]. Individuals that successfully overcome obesity often possess difficulties maintaining weight, fitness and physical activity [3]. To our knowledge there are no studies in regard to the idea to use computer-based active games to encourage physical activity in obese adolescents. PURPOSE: Firstly to assess mechanical and cardiovascular load of the active game compared to walking at different speeds. Secondly to examine the long-term sustainability of changes in BMI, body composition, encouragement of physical activity and motivation. METHODS: For the evaluation of applicability, 3-dimensional kinematics (4 cameras, 50 Hz) and kinetics (force plate, 200 Hz) of 8 obese adolescents (age 15-17) were collected during walking and active-game playing (Eye Toy Kinetic, Nike Motion Works 2003-2005). Heart rate was monitored using Polar S 625, cardiovascular load was compared to individual walking speed on treadmill. To analyze the long-term sustainability, so far 30 (15 training subjects/15 control subjects) took part in a 4 week hospitalized intervention for obese. The training group participated in addition to their clinic routine program, in an exercise group that played 3 times per week, 10 min the Eye Toy Kinetic active game. Outcome measures include pre- and post intervention assessments of BMI, body fat, blood pressure and physical fitness. Physical activity, motivation, self-esteem were asked pre, post and 3 months post of the intervention. RESULTS: Regarding the cardiovascular load during active game playing, mean heart rates were 140 HF (SD=10.69) and increased to a maximum of 173 HF. These individual heart rates correspond to individual walking speeds on treadmill of 7.0 km/h (SD=0.87). The mechanical force on the knee joint was comparable in magnitude, where as the tibia torsion moment was considerably higher in active game playing than in walking. After hospitalized intervention both groups show a significant BMI and body fat reduction (p<0.05) and increased endurance performance. Increased self esteem and a positive body image were assessed. The study including the effect of active game playing on long-term sustainability is still ongoing. DISCUSSION AND CONCLUSION: The active game is applicable for obese adolescents, since the rules and point system are interactive and encourage inferior performers to higher performance. The mechanical and cardiovascular loads during playing are comparable to moderate and intensive activities and should therefore be monitored carefully in obese patients.


Keywords: Adolescents, Obesity, Exercise