Conference Abstract

Motion Sensor Games to promote physical activity for obese adolescents

Michael James Taylor, Imperial College London, United Kingdom

Dave Taylor, Imperial College London, United Kingdom

Ivo Vlaev, Imperial College London, United Kingdom

Correspondence to: **Michael James Taylor,** Imperial College London, United Kingdom, E-mail: mtaylor3@imperial.ac.uk

Abstract

Introduction: In England just over a quarter of adults were classified as obese in 2010. This population is more likely to suffer from a range of illnesses2, have a lower life expectancy3 and are at significant risk of developing chronic conditions such as type-2 diabetes4. Childhood obesity is a serious problem in the UK, with around 20% of children aged 10-11 being overweight or obese1. Increased physical activity can help individuals to lose weight5, but this can be difficult to sustain6, particularly for children7, who may have limited access to exercise facilities8.

Aims and objectives: This work aimed to investigate the feasibility of using motion sensor games to encourage physical activity. This was done by providing overweight children with computer games that users play by moving around, with their movement being detected by a webcam acting as a motion sensor. The study involved investigation of the children's attitudes towards using these games and also whether playing such games as part of a group classroom session resulted in participants' pulse levels increasing. We also measured subjective wellbeing (SWB) and attitudes to exercise in relation to the COMb behaviour change model, which focuses on capability, opportunity and motivation9.

Methods: The games were played in 5 weekly sessions by attendees of a weight-management summer camp for children. Children played the games in a school Information Technology classroom in groups of 8 for about 20 minutes each. The games were accessed from a website using a desktop computer connected to a webcam. Participants' pulses were measured before and immediately after playing levels of the games (each level lasted about 3 minutes). Five similar games were used. All involved the player seeing a reflection of his/herself on the screen through the webcam, and moving around to interact with other on-screen objects (e.g. the goal of one game was to catch all the green flying objects while avoiding the red objects).

Results: Feasibility of using the motion detector games to encourage physical activity was established. Seventy-nine participants aged 7-17 took part in the sessions. Use of all 5 games resulted in significant increases in pulse levels, with the average increase from baseline being 10.82bpm. The majority of participants reported that they enjoyed (68%) playing the games and that they would like to play similar games in the future (80%). SWB and COMb attitudes were not correlated with attitudes towards the games. There were, however, significant correlations between SWB scores and COMb attitudes relating to physical activity, with participants who

reported lower levels of wellbeing reporting less opportunity, capability and motivation to exercise. The 'Opportunity' scale was correlated particularly strongly with SWB.

Conclusions: Motion sensor games provide an accessible, effective and enjoyable way for children to exercise indoors. They could be used at home, at school or as part of weight-management interventions. Providing this facility to children increases their opportunity to exercise, which may result in improved SWB and increased activity levels, contributing towards a healthier lifestyle and reducing the risk of obesity and associated chronic comorbidities.

Keywords:

obesity; Childhood obesity; motion sensor; weight management; exercise

Power Point presentation:

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