Active video games for health promotion: from METs evaluation to physical intervention in young adults

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Background:
Sedentary screen time and video games have been designated as major contributing factors in the development of obesity and metabolic disorders. However, in recent years, a new type of video game, able to track player movements and translate them into gaming commands, has been released. These active video games (AVG) have been presented as a promising tool to promote physical activity (PA). Studies investigating AVG intensity indeed rated the first generation of AVG as light PA (<3.0 METs) with some games able to reach higher intensities. However, no studies have examined second-generation AVG. For instance, a newly released AVG (cf. Wii U, Nintendo Inc. Japan) includes an independent, portable monitor allowing a 360° motion game modality that might increase player displacements, upper-limb solicitation and subsequent energy expenditure (EE). In addition, the few randomized controlled trials (RCT) have investigated AVG in children only. No study has examined postpartum women, who present a unique risk for weight-retention and development of metabolic diseases. The present study proposed an updated evaluation of AVG intensities by testing second-generation AVG METs. Additionally, a longitudinal study was conducted in postpartum women to investigate the effect of AVG on body composition.

Methods:
Eighteen second-generation AVG EE and METs were measured in young adults (N=16) using calorimetric chambers. The longitudinal study consisted of a 40-day RCT in 34 postpartum women. In the intervention group, women were given a Wii Nintendo console with the game Wii Fit (Nintendo Inc. Japan). Weight, body mass index (BMI) and body fat mass were measured before and after the trial. Playing time, EE and energy intake (EI) were also estimated using the Nintendo Expended Kilocalories Estimator and a diet history questionnaire.

Results:
The second-generation AVG presented a mean intensity of 3.2±0.4 METs. Most of them (61%) can be ranked among moderate to vigorous PA. In the intervention study, weight, BMI and body fat mass showed a significant decrease in postpartum women playing AVG, compared to their control counterparts (weight loss: 2.2±0.9 vs. 0.5±0.7 kg, BMI reduction: 0.9±0.3 vs. 0.2±0.3 kg·m⁻², body fat mass reduction: 1.5±1.1 vs. 0.5±0.7 kg, p<0.05). The women played AVG for 1420±737 min over the 40-day experimental period. A positive relationship was found between AVG EE and weight loss (R=0.703, p<0.05). EI decreased concomitantly with weight loss in the intervention group only.

Conclusion:
New game modalities introduced by the second generation of AVG may induce higher exercise intensity. In addition, the AVG intervention clearly showed a beneficial effect on postpartum women body composition. This effect seems mediated by both an increase of daily energy expenditure and behavioral change toward dietary habits. Other studies are needed to determine if such results could be extended to the general young adult population. Authors declare no conflict of interest.