High-Intensity 'Exergames' Motivate Children

VITALS

Major Finding: Energy expenditure increased four- to eightfold when middle-school children played any of a variety of "exergames," interactive video or electronic games that feature player movement similar to that in real-life games.

Data Source: A comparison of energy expenditure at rest with that during treadmill walking and 10 minutes of playing six different exergames in 19 boys and 20 girls aged 9-13 years.

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BY MARY ANN MOON

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A variety of "exergames" raised children's energy expenditure to a moderate to vigorous level of intensity, comparing favorably with treadmill walking at 3 mph, in a small study.

Middle school–aged children showed a four- to eightfold increase in energy expenditure when they played any of six interactive video or electronic games that featured player movement similar to what would occur with real-life participation in the games, said Bruce W. Bailey, Ph.D., of the department of exercise sciences at Brigham Young University, Provo, Utah, and Kyle McInnis, Sc.D., of the department of exercise and health sciences at the University of Massachusetts, Boston.

They assessed energy expenditure with three commercial and three consumer exergaming systems with multiple games, each with multiple intensity levels. These included the most aerobically challenging games available, with running, dancing, and simulated boxing.

It is the first published study to examine "commercial exergaming equipment that is currently being marketed to schools and fitness facilities as an alternative form of exercise," the researchers wrote.

The 19 boys and 20 girls, aged 9-13 years, were healthy and of diverse ethnic backgrounds (57% African American, 11% white, 12% Hispanic, and 20% other). A total of 21 subjects (54%) were overweight or at risk for overweight, while 18 (46%) were of normal weight.

Energy expenditure was measured with indirect calorimetry and a portable metabolic cart. The subjects were evaluated at rest, during 10 minutes of activity as they rotated through all of the games, and while walking on a treadmill.

Each game significantly raised energy expenditure to a moderate to vigorous level. Four of the six games raised it above the level expended during treadmill walking. "This level of intensity is consistent with current physical activity recommendations for children and can be used to alter energy balance," Dr. Bailey and Dr. McInnis said (Arch. Pediatr. Adolesc. Med. 2011 March 7 [doi: 10.1001/archpediatrics.2011.15]).

Energy expenditure was the same between subjects in the top 15% of body mass index and subjects with lower BMI. In fact, higher-weight children enjoyed one particular system, Sportwall, more than did normal-weight children.

"Sportwall was unique in that it was played in teams [of four to five children], and the activity was intermittent and of a high intensity. Thus, the social interaction and intermittent high-intensity nature of the activity may be why the children with higher BMIs enjoyed it more," the researchers said.

Boys and girls reported equally high levels of enjoyment with all the games. Boys tended to like the boxing game, and girls preferred the dancing game.

"Although exergaming is most likely not the solution to the epidemic of reduced physical activity in children, it appears to be a potentially innovative strategy that can be used to reduce sedentary time, increase adherence to exercise programs, and promote enjoyment of physical activity. This may be especially important for ... children who carry excess body weight," the investigators said. Future studies may assess how prolonged participation in exergaming alters energy balance and adiposity, they wrote. ■