

Use of interactive digital exercise games by children can result in high level of energy expenditure

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Middle school-aged children who participated in interactive digital gaming activities that feature player movement (exergaming), such as dancing or boxing, increased their energy expenditure to a level of moderate or vigorous intensity, according to a report posted online today that will appear in the July print issue of *Archives of Pediatrics & Adolescent Medicine*.

"The prevalence of overweight children and adolescents has increased drastically over the past several decades. This increase is troubling given the potentially numerous adverse health implications," according to background information in the article. The positive and prevailing relationship between obesity and sedentary behavior among children has been well documented, with a common sedentary behavior being screen time, which includes activities such as watching television or videos, using a computer, surfing the Internet, and playing video games. There has recently been increased interest in activity-promoting video gaming or video games that require physical movement and feature player movement such as would occur in "real-life" exercise participation.

"Active video games have the potential to increase [energy expenditure](#) during otherwise sedentary video gaming and may provide a viable adjunct to more traditional exercise," the authors write. "The potential of these games to promote fitness and extended periods of moderate to vigorous activity in normal and overweight youth has not been

evaluated."

Bruce W. Bailey, Ph.D., of Brigham Young University, Provo, Utah, and Kyle McInnis, Sc.D., of the University of Massachusetts, Boston, conducted a study to evaluate the potential effect of 6 forms of exergaming (3 commercial products and 3 consumer products) on energy expenditure in children of various body mass indexes (BMIs). The study included 39 boys and girls (average age, 11.5 years). In addition to treadmill walking at 3 miles per hour, energy expenditure of the following exergames were assessed for 10 minutes: Dance Dance Revolution, LightSpace (Bug Invasion), Nintendo Wii (Boxing), Cybex Trazer (Goalie Wars), Sportwall, and Xavix (J-Mat). Participants were given 5 minutes of seated rest between each activity.

The researchers found that all forms of interactive gaming evaluated in the study significantly increased energy expenditure above rest, with no between-group differences among normal (BMI less than 85th percentile) and "at-risk" or overweight (BMI 85th percentile or greater) children. Walking at 3 miles per hour resulted in an average metabolic equivalent task value (determined by dividing relative energy expenditure for each activity by a certain figure) of 4.9, whereas the intensity of exergaming resulted in an average metabolic equivalent task values of 4.2 for Wii, 5.4 for Dance Dance Revolution, 6.4 for LightSpace, 7.0 for Xavix, 5.9 for Cybex Trazer, and 7.1 for Sportwall. The researchers note that this level of intensity is consistent with current physical activity recommendations for children.

Enjoyment of the games was generally high, but overall, children at risk of becoming overweight or who were overweight enjoyed the exergames to a greater extent than did children with a BMI below the 85th percentile.

"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 at-risk populations, specifically [children](#) who carry excess body weight. Future research should longitudinally evaluate the impact of exergaming on [physical activity](#) patterns in youth. In addition, more research is needed to evaluate how prolonged participation in exergaming alters energy balance and adiposity," the authors conclude.

More information: *Arch Pediatr Adolesc Med*. Published online March 7, 2011. [doi:10.1001/archpediatrics.2011.15](https://doi.org/10.1001/archpediatrics.2011.15)

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