

Exercise Intensity and Energy Expenditure of a Simulated-sport Exergame versus Real-world Sport

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ABSTRACT

Despite the multitude of local and national health initiatives aimed at increasing physical activity levels in the United States, there remains a dire need to aid individuals and families in adopting regular physical activity regimens. This lack of activity necessitates the use of novel and innovative methods for encouraging regular physical activity, such as the use of simulated-sport exergames. However, it is unclear whether these games can generate comparable physiological states of exercise to those seen within the actual sports they are simulating. Using data taken from a larger study, the purpose of the current study was to objectively compare physiological measures of exercise intensity and energy expenditure for a simulated-sport exergame versus its respective real-world sport, using the sport of racquetball. Undergraduate students ($n = 103$) who did not regularly exercise were provided with twice weekly, 30-minute training sessions for a new sport (racquetball) and were randomized into three different conditions of introductory training (None, Exergame, and Traditional Training) over an eight week period. This introductory training took place during Weeks 1 – 4, then all groups were transitioned into playing the actual sport of racquetball. The exergame group required participants to play a racquetball exergame for introductory training, while the traditional training group played the sport of racquetball on a racquetball court. The third group served as a control and came to introductory training sessions at the university activity center, but was only required to read or study. All participants were fitted with accelerometers during participation in order to measure levels of activity (via accelerometer counts), exercise intensity, steps taken and calories burned. As expected, analyses revealed that the traditional training group showed greater levels of all outcomes than all other groups during Weeks 1-4. Contrary to expectations, the exergame group did not show greater activity levels or energy expenditure than the control group at any time. All groups showed similar levels of activity once transitioned into playing actual racquetball. These findings support previous literature suggesting that an actual sport can produce significantly greater activity levels than its exergame counterpart. These results also provide evidence that exergames produce levels of activity that fall well below those suggested by ACSM minimum exercise guidelines. Future interventions should use these results by limiting the use of exergames to the introductory phase of training.