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ABSTRACT

Integration of Physical Activity into Experiential STEM Lessons to Improve Energy Balance and Academic Performance

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Afterschool programs offer significant opportunities to increase physical activity levels and improve academic performance of children. **Purpose**. This study assessed an innovative approach to embed physical activity into academic lessons in science, technology, engineering and math (STEM) in an afterschool community setting. **Methods**: Participants were 47 Hispanic boys and girls (age=10.8 ±0.7 yr) who enrolled in an afterschool program offered at a YMCA located in an economically disadvantaged urban community. The 6-week curriculum included a 30-minute, twice a week, physical activity intervention (e.g., dance, games, sports). All participants wore pedometers and accelerometers and recorded their data after each session using an interactive website developed by the project team. The *Active Science* (n=16) group then participated in a series of age and grade appropriate academic lessons that involved using their activity data (e.g., steps, distance, and calories) to explore and reinforce important STEM concepts. The *Active Only* group (n=31) participated in the physical activity component only. The data were collected in fall 2012 and spring 2013. **Results.** For the *Active Only* group, the pre and post science scores increased from M= 46.88(SD=17.68) to M=58.97 (SD =13.26), Cohen'd =.52; For the *Active Science* group, the pre and post science scores increased from M= 44.75 (SD =13.58) to M=62.65 (SD =19.05), Cohen'd = 1.09. A 2(time)*2(group) repeated MNOVA test showed that interaction effect between time and group was not significant, $F(24, 1)=1.26$, $p>.05$. The time effect was significant on steps/hour, $F(24, 1)=43.07$, distance/hour, $F(24,1)=26.31$; calories/hour, $F(24, 1)=23.50$; and science scores, $F(24, 1)=39.00$, all Ps<.001. Time effect on physical attitude and group effect were not significant. **Conclusion**. A 6-week active education intervention increased physical activity and science test scores among pre-adolescent Hispanic children. *Active Science* group showed the trend of stronger improvement in science test scores compared to the *Active Only* group. The results of this study are well aligned with national recommendations that endorse innovative strategies to incorporate movement and activity into diverse school and afterschool curricular programs.

Characters: 1960