Heart Rate Responses of High School Students Participating in Surfing Physical Education

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Abstract

Background: Despite the nation’s rising epidemic of childhood obesity and diabetes, schools struggle to promote physical activities that help reduce risks for cardiovascular disease. Emerging data suggest that adopting novel activities into Physical Education (PE) curriculum may serve as an effective strategy for increasing physical activity in children. Purpose: The purpose of this study was to test the hypothesis that high school students participating in a novel PE curriculum (surf PE) would meet the American College of Sports Medicine’s (ACSM) duration and heart rate (HR) recommendations for cardiovascular fitness and health. Methods: Twenty-four male (n=20) and female (n=4) high school students (mean age = 16.7 ± 1.0 years) that were enrolled in a surf PE course at two San Diego County high schools participated in this investigation. Heart rate and HR measurements during surfing practices were recorded. Paddling, wave riding, sitting or lying, and miscellaneous activities comprised 96.7 ± 2.4, 9.0 ± 0.4, 42.7 ± 2.9, and 17.8 ± 5.3% of the time, respectively. The average and maximum HRs during this activity were 131 ± 2.0 and 177.2 ± 2.1 (bpm), respectively. Conclusion: The data suggest that high school students participating in surf PE obtained heart rates and durations that are consistent with recommendations for cardiovascular fitness and health. In the future, physical education programs should consider incorporating other action sports into their curriculum to enhance cardiovascular health.

Background

The purpose of the study was to test the hypothesis that high school students participating in a novel PE curriculum (surf PE) would meet the American College of Sports Medicine’s duration and heart rate (HR) recommendations for cardiovascular fitness and health.

Methods

- Twenty-four high school students, male (n=20) and female (n=4), enrolled in surfing physical education course participated in this study.
- Ages of participants ranged between 15-18 years.
- Consent, health history questionnaire, and surfing history forms were completed by parents and students prior to participation.
- Data was collected during the 2014 Spring semester.
- Average HR, max HR, and duration were assessed daily in all subjects using Polar heart rate monitors (Polar FT1) while surfing.
- HR and activity were assessed simultaneously over a single surf session using a HR monitor (Polar RCX5) and a video camera (Canon HD) in subsets of students (n=11).
- Surfing activities were classified as stationary, paddling, wave riding, and miscellaneous.
- Activity and HR were synchronized and evaluated in 5-second intervals during data analysis.

Statistical Analysis

- All data is presented as mean ± SE.

Results

- The average heart rate during paddling, wave riding, miscellaneous activities, and other activities were 131 ± 2.0, 177.2 ± 2.1 (bpm), respectively (Figure 6).
- The average duration of paddling, wave riding, and miscellaneous activities were 16.8 ± 2.0, 6.5 ± 2.2, and 13.5 ± 2.3 seconds, respectively.
- The average percent time spent during each activity was: 5.0% stationary, 7.5% paddling, 7.0% wave riding, and 16.8% miscellaneous (Figure 7).

Discussion

- The effects of intermittent high intensity physical activity interventions on cardiovascular fitness and health. JAMA, 2002.

References

- Andersen, L. B., & Nader, P. R. (2006). Physical education classes could have a more significant contribution to the students’ level of physical activity. Education and Health, 24, 77-82.

Conclusions

- The average heart rate (131 ± 0.87 bpm) of students participating in a high school surfing physical education curriculum is consistent with heart rate recommendations for cardiovascular fitness and health (Figure 1).
- The average exercise duration (61.7 ± 5.4 min) of students participating in a high school surfing physical education curriculum is consistent with duration recommendations for cardiovascular fitness and health (Figure 3).
- The average heart rate during paddling, wave riding, miscellaneous activities, and stationary were 145 ± 2.9, 142.0 ± 4.8, 140.6 ± 4.2, and 130.6 ± 4.7, respectively (Figure 5).
- Paddling, wave riding, miscellaneous activities, and stationary comprised 36.7 ± 2.4, 29.0 ± 4.2, 17.8 ± 3.5, and 42.7 ± 2.9% of the time, respectively (Figure 6).

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