Using Wireless Pedometers to Measure Children's' Physical Activity: How Reliable is the Fitbit Zip?

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Introduction

- Wearable technologies, like wireless pedometers, are promising ways to get children moving through physical activity and kinesthetic learning
- The purpose of this study is to investigate the reliability of wireless pedometers in measuring elementary school children's physical activity; specifically this study examines the reliability of Fitbit Zip wireless pedometer in measuring physical activity compared to the Yamax SW701 Digi-Walker
- The step activity of a randomly selected group of elementary school children was measured and compared using wireless pedometer Fitbit Zip and Yamax Digital-Walker SW701

Image source: http://www.fitbit.com

VS.

Image source: http://www.yamaxx.com

Research Questions

The study is guided by three research questions:

1) How reliable are wireless Fitbit Zip pedometers in measuring the physical activity of elementary students?

2) How do wireless Fitbit Zip pedometers compare to the Yamax SW701 analog pedometers in accurate measurement of counting steps?

3) What are the elementary students' perceptions and attitudes about wearing wireless Fitbit Zip pedometers in the school setting?

Method

- Research design was mixed-methods (Creswell, 2014)
- Participants included 13 boys & 12 girls, ranging in age from 8 to 11 years old. participant sample was 25 children (n=25)
- Quantitative data derived from the accuracy and reliably tests of the Fitbit Zip wireless pedometers. Over a six-week period, the study's participants wore the two pedometers: The Fitbit Zip wireless pedometer and the Yamax SW701. The Yamax SW701 was the study's criterion measure
- Two qualitative data sources. First, field notes were collected/organized by time notations. The second data source was focus group interviews; participants were asked about their perceptions of the Fitbit Zip

Findings

- Fitbit Zip wireless pedometers were found to have an appropriate degree (Nunnally & Bernstein, 1994) of accuracy and reliability compared to the Yamax SW701 pedometer
- The Fitbit Zip wireless pedometer collected more step counts than the Yamax SW701 pedometer, however, the difference was not statistically significant
- Participants reported that they preferred wearing the Fitbit Zip to the Yamax SW701 because the Fitbit Zip was more comfortable to wear and less likely to fall off
- Participants also reported being more motivated to move while wearing the Fitbit Zip (Xu, Byker, & Gonzales, 2017)

Conclusions

- Fitbit Zip has a high degree of internal consistency reliability with high intra-class correlations.
- Based on the reliability index for all days, the Fitbit Zip had a high reliability in step counts with reliability coefficient alpha in the acceptable range
- Strong correlation between Yamax SW701 pedometer and Fitbit Zip pedometer measures suggest that the Fitbit Zip pedometer provides an objective measure of activity levels and feedback on children's physical activity patterns
- Thus, the Fitbit Zip is a reliable measurement for children's physical activity step counts

References

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage Press

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