Measuring Pedometer Accuracy in Free Living Conditions
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Introduction

- Pedometers are a frequently used tool to measure physical activity (O'Sullivan & O'Sullivan, 2003).
- The accuracy of pedometers has been of interest given the popularity of the tool.
- Many potential sources of error, including missing data.
- This missing data can be a significant problem if researchers are interested in directly comparing between groups and/or conditions.
- Impossible to make direct comparisons without knowing how much data is missing.

Purpose

The purpose of the study is to examine how much information is missed when comparing between groups and/or conditions.

Methods

- Participants: 29 participants (16 males and 13 females) recruited from a university community in the Northwest.
- Equipment:
  - Pedometer: Omron - 720 FTC (Bannockburn, IL)
  - Accelerometer: Actical (Mito-Mitter, Bedford, OH)

Research Design

- Participants were blinded for the specific research questions, but were told the overall objective of the study.
- Participants were randomly assigned to either the experimental or control group.
- Participants in experimental group were given a log to record wear time.

Procedures

- All participants were asked to wear the belt from waking up until going to bed for at least seven consecutive days.
- One accelerometer strapped to wrist and a belt with an accelerometer and a pedometer were worn over the iliac crest.

Methods – cont.

Data Reduction

- To find the amount of missing wear time:
  - Each day consists of 1,440 data points
  - Missing wear time was estimated after rising in the morning and prior to bedtime.

Data Analysis

- To find the amount of missing wear time:
  - The percent of time the participants wore the pedometer was calculated based on number of minutes spent awake divided by total minutes participant wore his or her waist belt.

Preliminary Results

- These results are from 17 participants
- Participants on average wore their pedometers 14.26 hours during weekend days
- Participants were awake for an average of 15.95 hours
- The overall percent of time participant did not wear pedometer belt while they were awake was 11.08% with 95% confidence interval (6.34%, 15.81%)
- Experimental group missed 7.58% ranging from 3.13% to 16.73% of their total wake time.
- Control group missed 14.66% ranging from 3.22% to 34.98% of their total wake time.
- However, there was no statistical difference between the two groups, F(1,16) = 2.82, p > .05.

Discussion

- Reported results are from a preliminary analysis of 17 subjects. More subjects are currently being recruited to increase sample size and target subjects are 80.
- Based upon preliminary analysis
  - Participants are not wearing pedometer as instructed and it results in large amount of errors.
  - Using the log does seem to increase subject compliance on wear time

Future Questions

- What are appropriate strategies to increase participant compliances regarding wear time.
  - Log
  - Reminders, Emails
  - Social Support

References