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Why hard to reach populations are hard to reach: lessons learned from accelerometer data collection among new immigrants

Abstract

The likelihood for becoming overweight and obese increases with length of stay in the US for new immigrants; therefore, it is critical to understand modifiable lifestyle behaviors in order to reduce their risk of this chronic disease. Physical activity patterns of immigrant children are unknown and collection of this information is difficult. This Field Action Report describes the experiences of using accelerometers to collect physical activity data in Brazilian, Haitian and Latino immigrants living in the Greater Boston, MA area, who are enrolled in Live Well, a research study aiming to prevent unhealthy weight gain in these populations. We found that immigrant populations pose unique challenges to data collection, and actively addressing these barriers can improve data quality.

Keywords: immigrants, physical activity, accelerometers, overweight, data collection

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Introduction

Program description

Live Well is an NIH-funded (1R01HD057841-01), community-based, participatory research lifestyle intervention that seeks to prevent weight gain in new immigrant mothers and their eldest child between the ages of 3-12, by targeting their physical activity, nutrition, and stress management behaviors. The participants in the study are of Haitian, Brazilian and Latin American origin, and have recently immigrated (<10years) to the Greater Boston area. The study is led by a steering committee comprised of researchers from Tufts University (departments of Public Health, Nutrition, Sociology, and Engineering) and community partners from the Brazilian Women's Group, Welcome Project, Community Action Agency of Somerville, Haitian Coalition, and the Immigrant Service Providers Group - Health.

Current research suggests changes in physical activity behaviors represent a major predictor of chronic disease and weight gain.[1–3] The physical activity habits of new immigrants are difficult to quantify; thus it is unclear whether their energy expenditure changes the longer they reside in the United States,[4–6] and whether, by association, their risk for certain chronic diseases increases.[7–9] To address this knowledge gap, we measured various kinds of physical activity among Live Well participants.

We provided mothers with pedometers (to keep) and children with Actigraph GT3X accelerometers (to return). We also gave each participant a self-report activity survey. Research staffs were prepared for typical hurdles associated with this type of data collection, such as adherence and lost instruments, yet we were unprepared for other challenges unique to this population. The purpose of this Field Action Report is to outline how our process of accelerometer instruction, administration, and data collection evolved, with the hope that future research studies targeting hard-to-reach populations may improve the quality and quantity of their data.

First cohort baseline – spring 2010

Live Well measurements were intensive. Participants completed an extensive health survey, had height and weight measured, provided dietary intake information, and were instructed on how to use an accelerometer (children) and pedometer (mother). The accelerometer and pedometer protocols were given after subjects completed all other measurements with the thought that this new information would then be freshest in participants' minds as they left the study site. Trained interpreters assisted research staff who did not speak the participant's language, and research staff modelled how to properly wear the devices. We marked a black dot on the top of the accelerometer so that participants would know in which direction to wear the accelerometer. Subjects were given a chance to ask questions. Most of those posed related to if the child could wear the accelerometer at night (yes, if comfortable); if the child could wear it at school (yes); and whether it could get wet (not to be worn in the shower or pool). Participants were instructed to wear the accelerometers /pedometers every day for one week, complete the self-report activity logs, and return the accelerometer and surveys in a provided, pre-addressed, postage-paid envelope. At the first baseline measurement, 82 accelerometers were administered, 60 were returned, and 45 had valid data (defined as a minimum of four days of data including one weekend day).

With a 73% return-rate, and 55% valid data, study staff decided to connect with participants to try to understand the reasons for the low return rates. Here is what we learned:

a. Some subjects did not know how to use the US postal system. Other subjects lived in neighbourhoods that did not have a postbox, and the nearest post office was inconveniently located.

b. Some subjects thought the accelerometer, which does not have a digital screen like the pedometer, was a GPS or other form of tracking device. Since some of our subjects may be

undocumented or generally fearful of government, this was a major concern. Accordingly, some parents threw away the accelerometer.

Second cohort baseline–summer 2010

Based on what we learned from the Spring Baseline, the following changes were made:

i. All participants received a handout (in their native language) that illustrated:

ii. Which instrument to return (a "check" was placed next to an image of the accelerometer, whereas an "X" was placed over an image of the pedometer)

iii. How to mail the accelerometer back, including an image of a postbox, and how to use it. We also left boxes at each of our community organizations in case a postbox was not located in a subject's neighbourhood, or if participants were more comfortable using that as a means of return.

iv. Accelerometer/pedometer instruction was given at the beginning of the subjects' baseline measurements. This change was made because we realized participants were mentally fatigued at the end, making it difficult for them to pay attention to the protocol, especially since most were unfamiliar with either pedometers or accelerometers.

v. During administration, we explained that the accelerometer did not have tracking capabilities; it measured the intensity of activity, not the location.

vi. At this measurement point, 51 accelerometers were given, 35 returned (69%) and 27 had valid data (53%).

Third cohort baseline/first & second cohort 1-year assessments–spring/summer 2011

Based on what we learned from the Summer Baseline, the following changes were made:

a. The word, "UP" was written on the accelerometers, as participants found the black dot confusing.

b. Using the graphing mode of ActiLife 5.6.1 software, we showed participants sample accelerometer data output.

c. Another qualitative change, which we did not foresee having an impact, was the gender of the researcher administering the protocol. Originally, it was an American female, working as a Doctoral fellow on the study. For the 2011 measurement days, the administrator was a male, visiting professor from Majorca, Spain. Anecdotally, this changed the women's attentiveness and time spent receiving accelerometer instruction.

d. At this measurement day, 30 accelerometers were given, 26 returned (87%) and 22 had valid data (73%).

Discussion & evaluation

Originally, we insufficiently considered our population's legitimate fears and concerns surrounding unfamiliar tools, cultural perceptions about socially desirable behaviors, and accessibility to, and knowledge of how to use, the US postal system. As can be seen by the tables below, there were non-significant (NS) differences between groups in terms of received and returned accelerometers; yet, across all groups the return rates increased, as did valid data (Table 1) (Figure 1).

Table 1 Percentage of returned accelerometers and valid data; mean: age, BMI, physical activity prevalence, and percentage of subjects that meet standard PA recommendations. Data from all Live Well baseline measurements.

	Returned %	Valid Data %	Age	BMI	MVPA Min./Dayb	PA Recommendation (%)
Latina	79.6	81.3	6.2	18.57	56.59	43.5
Brazilian	73.6	75.4	6	18.19	59.32	43.9
Haitian	64.8	75	6.1	18.67	58.16	43.1
Total	73.6	77.5	6.1	18.4	58.58	43.6

BMI, body mass index, MVPA, moderate to vigorous physical activity (Standard recommendations is >60min/d)

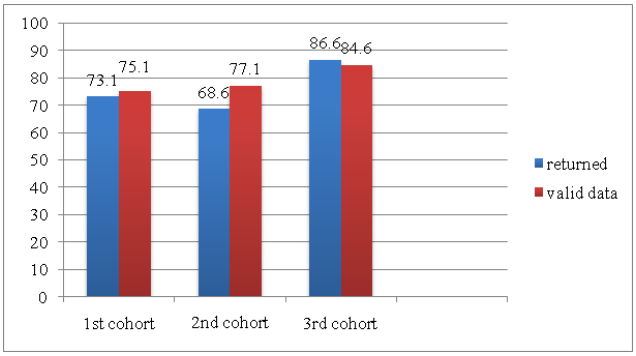

Figure 1 Percentages of returned and valid data.

Conclusion

Immigrant populations pose unique barriers to accurate data collection of physical activity using accelerometers, including knowledge of the US postal system and concerns about hidden tracking devices in the measurement. Including explicit directions for participants about how to return the accelerometer, administering the protocol at the beginning of assessments, and even the gender of the research staff describing the tool may impact return rates. Studies using accelerometers to measure physical activity in immigrant children should conduct formative research to ensure barriers, such as those presented here, do not prevent the collection of high quality data.

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None.

Conflicts of interest

The author declares no conflict of interest.

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