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Fitbit and Fitabase Technology: Tracking and Evaluating Youth Physical Activity

Abstract

With the health of today's youth a national priority, professionals need tools for accurately assessing activity patterns and motivating behavior change. Fitness technology may be a promising tool for promoting positive behavior change. The afterschool program WeCook: Fun with Food and Fitness focused on improving food preparation skills, nutrition knowledge, and physical activity levels of youths. As part of the program assessment, each participant wore a Fitbit near the beginning and end of the program. Fitabase, an online research platform, was used for aggregating and analyzing data. We discuss a model for incorporating these technologies.

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Introduction

With the health of today's youth a national priority, professionals from a variety of disciplines need tools they can use to accurately assess activity patterns in various populations and to motivate behavior change in individuals. Historically, researchers have used accelerometers, which are wearable devices that estimate a user's step count and energy expenditure. Although accelerometers have been shown to be valid and reliable in multiple research settings, there is a need for more feasible and inexpensive options for monitoring physical activity in the general population (Gusmer, Bosch, Watkins, Ostrem, & Dengel, 2014). Because of technological advances, wearable activity tracking devices, such as the Fitbit, are now commercially available and increasingly have proved to be reliable, primarily in relation to step counting (Mackinlay, 2013; Mammen et al., 2012). Additionally, the Fitbit uploads data wirelessly to a web-based database and provides direct feedback from the device to the user (Gusmer et al., 2014), greatly increasing feasibility and participant interface. This article describes how wearable technology is being used to enhance the 4-H healthful living program WeCook: Fun with Food and Fitness (WeCook), the rationales for use, and recommendations for future implementation.

Program Design

Given the health risks of obesity and the economic burden caused by obesity-related complications, there is a

critical need to reshape youths' environments and behaviors. Extension and 4-H programs provide key opportunities for encouraging healthful habits during out-of-school time. With poor eating habits, lack of food preparation skills, and physical inactivity on the rise, WeCook addressed these issues through a 12-week program that engaged at-risk fourth- and fifth-grade youths in a comprehensive, multifaceted approach to improving health. Throughout the program, youths attended two 60-min sessions per week. One session was dedicated to teaching food preparation skills and the importance of balanced nutrition using U.S. Department of Agriculture guidelines, and the other session focused on increasing physical activity through interactive games.

Preprogram and postprogram surveys were administered to youths and their parents/caregivers. Additionally, each youth wore a Fitbit Charge for 1 week near the beginning and again near the end of the program to track physical activity. The 1-week time frame was selected in part due to the estimated battery life of the devices. Individual Fitbit data automatically synced to the WeCook Fitabase account, an online research platform. Fitabase was used for collecting, aggregating, analyzing, and exporting the data while maintaining participant confidentiality. Table 1 provides a brief overview of Fitbit and Fitabase setup, distribution, and implementation.

Table 1.

Overview of Fitbit and Fitabase Setup, Distribution, and Implementation

Program week	Location	Fitbit-related tasks/information	Fitabase-related tasks/information
Week 1	At club	<p>Have youths and their parents/caregivers sign consent forms containing a section outlining Fitbit use and rules.</p> <p>Assign identification numbers to youths.</p> <p>Weigh and measure each youth. Weight, height, and birth date are recorded to program the Fitbit.</p> <p>Measure youths' wrists to determine appropriate Fitbit size. Assign each youth to a specific Fitbit.</p>	
	In office	<p>Create Fitbit accounts for each youth through the Fitbit Connect application on a Microsoft device. Microsoft devices allow for the syncing of more than one Fitbit.</p> <p>Create and maintain accurate records regarding youth Fitbit assignments.</p> <p>Charge the Fitbits completely. Note:</p>	<p>Fitabase provides direct customer training and support in programming the Fitbits.</p> <p>Enter identification numbers into Fitabase.</p> <p>Sync the programmed</p>

		Multiple Fitbits can be charged at the same time with the purchase of a USB charging station.	Fitbits to Fitabase. Fitabase provides direct customer support in syncing to the online platform.
Week 2	At club	Distribute the assigned Fitbits. Explain the care/rules sheet. Send copies home to be shared with parents/caregivers. Give youths physical activity goals for the week.	
Week 3	At club	Collect the Fitbits according to assignment records.	
	In office		Resync the Fitbits according to the original process. Fitbit data will then automatically sync to Fitabase. Export and save the necessary data spreadsheets for future analysis.
Week 4	At club	Give each youth the opportunity to view his or her individual online Fitbit dashboard. Congratulate youths on reaching their physical activity goals.	

Rationale for Use

An increase in daily physical activity has been shown to improve a number of health outcomes. Keeping this in mind, accurate measurement of physical activity is essential for understanding how it contributes to chronic disease prevention. Objective methods of assessment, such as those achieved through the use of wearable activity tracking devices, have become standard for evaluating physical activity levels (Mammen et al., 2012). This section outlines the rationales behind selecting the Fitbit and Fitabase technologies for the WeCook program.

Fitbit Rationale

- A number of studies have shown that Fitbit technology is valid and reliable for measuring steps in healthy populations, making it a feasible and comparatively inexpensive evaluation tool (Gusmer et al., 2014; Mackinlay, 2013; Mammen et al., 2012; Takacs et al., 2014).

- Participants are able to view their individual data on both the wearable device and the online dashboard, creating the potential for greater buy-in among youths.
- Fitbit.com has a comprehensive privacy policy that meets confidentiality standards.
- The Fitbit Charge was chosen for the following reasons (Fitbit, n.d.):
 - It tracks minute-by-minute steps and sleep automatically.
 - The watch and display can be customized depending on what is being tracked.
 - It has a battery life of 7–10 days.
 - Data sync wirelessly and automatically.
- Fitbit has gained popularity among consumers, leading to the potential for greater acceptance by youths as compared to their acceptance of other research tools.

Fitabase Rationale

- Data gathered from multiple devices automatically sync to the Fitabase dashboard. The dashboard can then be used for viewing all data reported since the preceding sync (Fitabase, 2015).
- Spreadsheet exports of reported data can be created for a custom date range and can be retrieved in day-, hour-, and minute-level intervals (Fitabase, 2015).
- Fitabase.com has a comprehensive privacy policy that meets confidentiality standards.

Recommendations for Implementation

As part of a complimentary evaluation method, each WeCook youth participant was given a Fitbit Charge to wear for 1 week near the beginning and again near the end of the program. Fitabase was then used for collecting, aggregating, and analyzing the Fitbit data. Recommendations for successfully incorporating these technologies into other healthful living programs are as follows:

- Select a wearable device that fits the program goals, keeping in mind that Fitbit devices are thought to be most accurate in the area of step counting.
- Contact Fitbit.com to determine whether the program qualifies for a research/educational project device discount.
- Contact Fitabase.com to set up an account and receive new user training.
- Develop systems for participant identification numbers, device assignments, programming and distribution of devices, and rules/care guidelines.

- Allow time for each participant to interface with his or her individual Fitbit.com dashboard to assess current level of physical activity and set personal goals for improvement.

Summary

Being physically active from a young age is one of the most important steps to lifelong health. Extension educators have a unique ability to work with school-aged youths at both the individual and community levels (Sheehy & Dharod, 2008), providing ideal settings for both evaluating physical activity levels and influencing behavior change. With activity tracking technology becoming more prevalent and reliable, Extension educators may want to consider incorporating these user-friendly devices and online platforms into healthful living programs.

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