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What is the perceived effectiveness of fitness trackers among adults?

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Abstract

With the technological boom there have been numerous innovating pieces that have added to American's quality of life. Fitness tracking devices are one of these items. While many believe they are inaccurate, the dedicated users of this study find them to be quite accurate and effective. They have compared their devices to others in their fitness classes, to the mileage markers along walking paths and even to the mileage tracking mechanism of the treadmill. It has been determined that fitness devices may be helpful for anyone interested, however the effectiveness is largely determined by the goals and action plan set by the individual and their dedication to living healthfully.

What is the perceived effectiveness of fitness trackers among adults?

Introduction

Technology is changing the way that humans see and approach life. There is technology in the shape of computers, and phones, to machinery for construction, agriculture and even medicine. While technology has in many ways improved society, it also has unwanted negative side effects, including a decrease in physical activity and increased numbers of those overweight and obese. According to the Centers for Disease Control and Prevention (CDC) as of 2011-2012, "[The] Percent of adults age 20 years and over who are obese is 35.1%, [and the] Percent of adults age 20 years and over who are overweight, including obesity is 69.0%" (CDC, 2015, para.1). This is an overwhelming number of people, and it is severely impacting health of the individual, their families and society at large.

To combat these numbers, in 2006 "Nike and Apple created Nike+iPod: The device, placed inside or on your shoe, tracked fitness information during your walk or run. The Fitbit Tracker launched in 2009 and clipped onto your clothes to track steps, calories burned, activity intensity and sleep habits" (ShareCare Inc., 2014, para. 2). From that time there has been many improvements and expansions for these companies and still others have joined the market to offer various alternatives. Some of these tracker alternatives include Global Positioning System (GPS), heart-rate monitors, interval training options and possibilities for tracking while biking, swimming, skiing and the like. Experts at the American Heart Association stated, "The devices are flooding the marketplace as the technology and sports industries create 'wearable fitness coaches' for customers interested in tracking their activity levels, food intake, heart rates and sleep patterns" (American Heart Association, 2014, para. 2). Many Americans have joined this fitness revolution and some are finding that they love it while others have found that it is not as

effective as they were hoping it was going to be.

This paper will first explore both the positive and negative views of fitness trackers. Secondly, real stories of Americans adults who have joined this world of fitness technology and how effective they find their tracker will be shared. Finally, there will be discussion regarding the correlation between research and the individuals.

Literature Review

People are getting on board with this 'fitness revolution'. They see their energy levels plummeting, their waistlines expanding and are seeking ways to find the motivation for exercise and living a healthy lifestyle. Many are seeing potential in this new technology as is evident by statistics. It has been found that, "One in 10 Americans over the age of 18 now own a fitness tracker. By 2018, more than 13 million wearable activity-tracking devices will be integrated into employee Wellness programs, based on estimates from ABI Research" (Wooldridge, 2014, para. 2). Fitness gadgets are gaining popularity, but what has research been finding regarding these devices?

Humans welcome that which is concrete, and visible. Especially in the hustle and bustle of life and 'instant gratification', companies have had to adapt and find ways to keep up with societal trends. The companies that provide fitness technology have found a balance of incorporating social media while also giving solid data regarding ones exercise routine. Beckham relates, "By providing this data instantaneously, and in some cases allowing you to share it via social media, they do more than inform. They reinforce, motivate and reward by turning exercise into a game" (Beckham, 2012, para. 1). By turning things into a game for ones self, or among a group of others, there can be healthy competition. This environment sets one up with positive motivation for seeing proof of dedication and hard work. Beckham (2012) continues to say:

To know whether you're getting better at something, you need data. As physicist Lord Kelvin said, "If you cannot measure it, you cannot improve it." Once you've got data, you need specific goals or standards to provide the sense of accomplishment that will make you work harder (para. 4).

One must have a set goal in mind when one exercises. Having a goal in mind, whether it is training for a race, or just to improve cardiovascular health; with the help of data and numbers this can continue to prompt the individual in their endeavors. It is encouraging for people to see improvements not only at the computer, but also with their bodily progression as a whole.

Adults today have very busy, full schedules, especially for those who have children. People are working more and being at home less. A large majority of these working adults are in office positions as opposed to past generations that were working on the farm. These office positions and long days make it easy to go home to relax, and unfortunately, sit some more in front of the television. However, with fitness trackers adults are motivated and just simply reminded to get moving and exercise. In the article by Wooldridge he talks to the director of Fitbit Wellness:

[The director] noted that many workers today have relatively sedentary office jobs. She said her company's research shows that just wearing a fitness tracker motivates people to get up and move more. "By wearing an activity tracker, you're likely to get about 40 percent more active just by putting one on," she says (para. 7).

By simply wearing a tracker they have found that people are 40 percent more likely to be active. This could include parking farther away from the entrances of stores and work, to taking the stairs instead of the elevator. With obesity rates as high as they are this could be a great resource for adults in todays world.

One study by Wake Forest University worked with a group of obese people for 10 months, five of which were focused on weight loss. Part of the group used fitness trackers and part of the group did not. The study found that, "The people who had the fitness trackers weighed about 10 percent less than their baseline weight, while those without the trackers weighed only about 5 percent less" (Brownstein, 2014, para. 2). Those that used a fitness tracker had double the effectiveness than those that did not use a tracker. In the words of Brownstein, "[This study] provides early evidence that adding a fitness tracker and instruction (which researchers call a 'self-regulatory intervention') to a fitness regimen may help people lose weight and maintain that lower weight" (Brownstein, 2014, para. 4). This study shows that fitness trackers can be effective tools for helping people lose weight. The adult feels in control of their body and trackers can potentially help them break away from fad diets to a mindset of making this a lifestyle choice.

Research has shown drawbacks for fitness trackers. Fitness trackers and their website counterpart have the ability to determine ones 'input' of food and 'output' of energy. While this feature can be helpful in getting a picture for potential weight loss, many adults are in a way cheating themselves by taking this opportunity to eat more. An article by Bee (2014), finds psychologists saying:

> By focusing purely on statistics churned out by electronics you risk losing the ability to listen to your own body. You stop moving because the device says you've reached your daily target, though you could do more; you eat more because it says you can, not because you are hungry (para. 11).

According to what psychologists are finding, instead of taking advantage of a higher 'output' and losing weight, people are eating more because 'it says you can'. People are losing the ability to

listen to ones own bodily needs, and then are maintaining the weight instead of losing it. Another thing that can skew this input/output is the data collection itself. Since most trackers are worn on the upper extremity any jarring movements or bumping into something tracks this movement as a step. Or perhaps, on the other side of this; those using low impact machines such as the elliptical, or bike are not getting the credit for the exercise that has been performed. Bee puts it this way, "The bracelet smart-pedometer can be fooled into thinking you are moving your lower body more than you actually are. The result? Elevated calorie expenditure readings. Good for the self-esteem; not so good for the waistline" (Bee, 2014, para, 5). When one is gauging how much to eat according to their output, things can get out of hand quickly if the data has been misconstrued. For those that are trying to become healthy, and lose weight, they can get discouraged and even frustrated if they start seeing the opposite happen.

Another problem that researchers are finding is that many adults stop using their trackers for one reason or another. In the article "Fitness- Fix or Fad" by Wooldridge (2014), he says: "More than half of the U.S. consumers who own an activity tracker have stopped using it. For younger adults, trackers are as much a fashion device as a helpful tool, and the appeal can wear off" (Section "A tool for Employee Wellness, para 4, 5). Another article on this topic suggests a few reasons why this may be, "A number of factors contribute to why consumers lose interest: wearability, mobile application challenges, device look and feel, informational challenges, and other motivational challenges" (Obesity, Fitness & Wellness Week, 2014, para. 5). For many young adults it seems that fitness devices may be just the current fad, and "the thing to do". Because of this mindset, and without goals, they lose interest. However, Wooldridge (2014) continues on to explain, "For older Americans who are concerned about their fitness and may need that extra motivation, the trackers can be useful (Section "A tool for Employee Wellness,

para 4, 5). While these trackers may lose their 'fire' for younger adults, older adults seem to keep their motivation and make it into a lifestyle of fitness instead of a passing fad.

Methods

The researcher performed a qualitative research approach for the question at hand. There were three individuals interviewed with a semi-structured interview format. These individuals have used a variety of devices, have owned them for different lengths of time, and use them on a regular basis. Two of the three interviewed are male, while the third is female. Each of the individuals interviewed are friends, and/or family friends of the researcher. Two of the three interviews were performed at the individual's home during the morning, and the third was at a friend of the interviewee's home in the evening. This provided a casual and comfortable atmosphere for both the interviewer and interviewee.

To set the stage for the interview, the interviewee was provided with a copy of the question list to look over before the start of recording. An Android mobile device was used to record each of the interviews. The first two individuals have had their devices over a year and are in middle adulthood, and both of their interviews lasted right about 20 minutes. The third individual is a young adult who has had their device less than three months; this interview lasted about ten minutes.

After the interviews, each was individually transcribed from the recordings onto a Word Processing document. The transcribing process consisted of about six and a half to seven hours of pausing/playing the recording and re-playing the audio to confirm the scripted material. After transcribing, each interview was printed for review. The double-spaced material, with two-inch margins came to be approximately 30 pages of data. Upon review, themes were found within each separate interview and then between the three interviews together. Each document was then

coded with short abbreviations for preparation of further analysis. Revisions and reviews of the documents took place, which included additions and detractions of potential themes and ideas. Another student was able to look over and code one of the interviews collected to aid in sighting themes and ideas throughout the dialogue. This process took roughly three and a half hours. In total, six categories were developed based on the ideas that emerged. These categories are simple, overarching themes that were found within each of the three interviews.

Results

The study to find the perceived effectiveness of fitness devices proved successful. The interviews uncovered six main topic themes. Usage, demographics, comparisons between devices, motivation, positives/negatives, and the perceived accuracy was uncovered. These themes are 'umbrella' themes that, in turn contain several sub-categories.

All three participants use their Garmin exclusively for running, which turns out to be three to five times a week between those interviewed. One participant uses a Fitbit that is used from the time she gets out of bed to the time she crawls back in at night. There are a lot of exercise activities and classes that these individuals take part. They participate in running classes, Zumba, and various stretching and cross training activities.

It was revealed that there is a certain demographic of people to whom fitness devices are limited. Not only to those of a higher social class, but also specific athletes of certain ages. Most of those interviewed pointed out that social class, age and even the type of athlete can be a limiting factor for those who want to get a fitness device. One of the subjects put it this way:

> [The Middle Class] Make it their priority, because they have a certain grasp on life and a certain amount of stability and they want to go out and improve that even further.

>Whereas somebody who doesn't have enough money to come in to do much of anything
>
>they are just trying to survive (Subject C).

Many times these people have other things going on and they may not have the time or energy to use the device even if they were able to afford a device. It was also found that the older adults might have a harder time with these devices.

One of those interviewed shared how her dad figures out his splits and time per mile through a regular digital watch. However, having to use the computer or mobile device along with the fitness device may be difficult. This subject puts it this way: "For the more elderly population, the Fitbit, the fact that it has to be linked to a computer, or that you have to link it to your smart phone. I think just the technology of using it is just harder for them" (Subject A). This participant goes on to point out how a certain type of athlete can be limited by a device:

>And the other thing is that they are limited, because they are for walkers or runners. You
>
>can't wear your Fitbit to swim. If it gets that wet, it gets ruined. So I think it is limited
>
>that way. And the bands only come in two sizes. So if you were really heavy you
>
>wouldn't be able to wear it (Subject A).

While many trackers keep track of steps, what about those that also may want to swim or perhaps bike? What if someone on the heavier size wants to get a device to aid in his or her fitness and weight loss journey? Subject B shared that a Garmin may be able to cater to those who have a broad area of fitness activities:

>I think this one is actually something that you can use for cycling as well, because it is set
>
>up on satellites to cover your distance. I've used it for hiking, although almost anybody
>
>could use it for what ever their activity of preference would be. They could gain some
>
>information from it and some motivation (Subject B).

While there may be some limitation for some activities, there are many activities that can be done with a device. If not, a different device may be an option.

The trend found for comparing devices was mainly between pedometer/Fitbit and the watch/Garmin, and between older models and newer models- for accuracy purposes. "I had used a pedometer in the past and it was really inaccurate, and so I wanted to get something that would record my distance a little more accurately" (Subject A). Another interviewee stated, "I ended up using a lot of mental energy [using a watch] trying to calculate and figure. I think that was probably the experience for me to get something that was a little bit more accurate" (Subject B). In the end, they seem pleased with their device, although Subject B may look into getting a new model because of the long use they have already gotten out of their device.

People have discovered that there are various ways that people gain motivation through their fitness device. They found that it helps them have/and or set a fitness goal. It helps motivate them through the people they work with, such as the company or co-workers, friends, and simply those they come in contact with who have devices. In addition, they are encouraged by the incentives that their work place provides. Incentives such as insurance perks and points that add up to be spent as money on various exercise equipment and even covering costs of races and competitions. Individuals shared that they are motivated by seeing the data that displays how efficient they have been and are being. According to one of those interviewed:

> One of the things I have really noticed is that they can't wait to get rid of it and then a month or two later they're saying, 'I am wearing it again, because I really turned into a slug'. They just didn't have the motivation, and they just quit doing it (Subject A).

People find they are more active with their device and do not like how inactive they are without it.

Most of the complaints were due to personal preference. For example, Subject B does not like that the Garmin is a bit too bulky-however, he likes the size of display. Subject A would prefer if the Fitbit had a numerical reading instead of just the dots. Both participants do point out that there are new models that address these complaints. Subject C says that a louder beep for interval training would be helpful-especially for when training on the treadmill when lots of people are around. The only major complaint, which was by Subject B, had to do with how well the charge holds for the Garmin model he has. He attributes this to it being a model from about four years ago and the length of time he has had it.

It was very surprising how accurate the participants believe their trackers are. They had solid numerical values to back up each of their beliefs as to why they believe their tracker is accurate. They have had experiences with running with mile markers, or on the treadmill, which provides a great way to compare the readings of the Garmin and Fitbit. Subject A explains her experience with the accuracy of both the Fitbit and Garmin:

> I have had sometimes when I thought the Fitbit wasn't very accurate. But, now that I am using the Garmin when I run and I have my Fitbit on too, I can see that it really is [accurate]. It is pretty close. It is not quite as close as the Garmin for the mileage but it is pretty close. And the Garmin I think is really accurate. I have noticed when my group runs together everyone's Garmin is going off within 3-6 steps of each other. So, for a mile when I am running with the mileposts it will be pretty accurate (Subject A).

She goes on to describe how close the Fitbit is after using it on the treadmill:

> And the other thing that I've done with the Fitbit when I was trying to see how accurate it was, was that I went on the treadmill. And it was within a tenth of a mile, so, it wasn't bad. But with my Garmin, I wouldn't like it if it was off that much (Subject A).

All in all, for a device that one wears on the arm it seems pretty reliable. Subject B tells his story:

> Yeah, when I ran the Philadelphia marathon I was, you know, this was measuring a shorter mile that the course was laid out. And you know, .05 was what it looked like. [Wife- 'We were talking to a guy in the airport about that and he was saying that he thought with the GPS devices, cause I was noticing that with mine.'] Well you are running under bridges and with the buildings. ['Yeah he was saying that he thought that interfered a little bit with the accuracy. Cause he had done numerous marathons, and had noticed that happened in big cities.'] So, I just took that into account. So I was just like, okay I know that this is pretty close, but it's giving me credit for further distance than the course is giving me or how the course is laid out. But it was close enough that I didn't have to be too worried (Subject B).

This is especially valuable information for others who are running in the city, not only for races, but those who run there on a regular basis. Even though Subject C has only had his device for several months, he also shares a positive view for the accuracy of his Garmin: "I'd say it's fairly accurate, probably within about 10 or 15 feet. Cause sometimes when I run and then look online at the GPS I can see the trail is not quite on the trail but it is really close" (Subject C). It is clear that these participants are pleased with the performance of their device and will continue to use them for years to come. They see results, not only numerically but also in the way they feel and look.

Discussion

Past research and this study find fitness trackers to be revolutionary. With personal dedication they can help users be more active and reach their goals. These fitness devices and trackers act as a mini personal trainer; giving necessary feedback to motivate the individual.

Participants find their devices not only to be motivational, but also very accurate. While research has shown that some people may cheat themselves by eating more based on what the data says they 'need', participants from this study did not indicate that this is a problem for them. They did mention that they see people lose motivation, but not because of the lack of results. Instead, they lose focus and have a lack of drive. Just as was shown in the literature review, this can be due to the loss of appeal and lack of setting long-term fitness goals. Those interviewed in this study back that finding. In any activity, one must have not only a goal in mind, but also an action plan with specific steps on how to get there.

Something interesting to note is that while research shows that older Americans may find trackers more useful, participants interviewed said that older adults might be turned off to the idea of a tracker due to the technology involved. However, participants also concurred that these devices can be helpful for anyone interested in tracking and improving their fitness level. While this is very true, one who is looking into purchasing a device must also consider a few things. They should look first at their current fitness level, and then make a goal based on their interests. Those who are avid athletes may want to invest in a Garmin for specific data and tracking purposes, while "newbies" may find more use for a Fitbit.

Past research concluded that due to all the movements by the arms throughout the day, including bumping and jarring, that these trackers are not very accurate. However, this study found some interesting information regarding accuracy. Most stated that they were motivated to purchase their device because they wanted something more accurate. They had experienced inaccuracy with a pedometer and/or digital watch, and wanted something that was more dependable. Most of those interviewed have compared their devices data to the treadmill, to mileage posts on walkways and even to their friend's device during workouts together. While

the margin of error is slightly larger for the Fitbit than for the Garmin, both are "close enough"
that the participants do not mind and still consider them very reliable.

There is still a lot of speculation about fitness devices from researchers and even much of
the population. Many people feel as if trackers cannot be accurate and that they are simply going
to be a short-lived trend. On the other hand, those that are dedicated to using their devices find
that they are accomplishing their goals and are pleased with their experiences time and time
again.

There are some differences when it comes to the types of devices that need to be
addressed. Fitbit devices are much simpler than the Garmin watches. Fitbit's are a step tracker
and due to the number of steps taken per unit of time it can tell if the intensity of exercise is low,
moderate or intense. Garmin watches are satellite based and are able to track mileage/distance
covered per unit of time. Knowing this we can already see that the Garmin may be more
accurate. However, no matter what the devices depict, one must judge how hard they are really
working based on common sense. It is important to point out the following perspective on
intensity. The article in the Milwaukee Journal Sentinel by Nickel says:

> We can get caught up looking at these steps and it is kind of myopic, a narrow focus.
> You're definitely burning a ton more at that boot camp class than you are walking around
> the house or walking on the treadmill. No matter what that Fitbit says. Look at the
> intensity of the exercise (Section 2, para. 4).

While data is helpful, one must still use judgment and common sense. While focusing on steps
may be very narrow minded, one should take into account the individual. If the individual is
coming from a dedicated fitness regimen reaching 10,000 steps is too small of a goal and
improvements will be limited. On the other hand, if the individual is overweight reaching 10,000

steps is going to be a lofty goal. But they will see dramatic results because of the increased activity level.

Due to the small scale of this study, there are limitations to conclusiveness. More definite results could be drawn if there were more participants to share their experience with their tracker.

Conclusion

For many people fitness trackers are just the thing that they need to 'get the ball rolling' for their fitness goals. While trackers may be limiting for certain populations, they can be very helpful for those that can and do use them. People generally find them very accurate in regards to mileage/steps throughout their usage. Most anyone can find a tracker helpful; from avid athletes to the 'want to be' athletes. Ultimately, an individual should look at tracker options and see if they could find it beneficial to them personally based on their exercise habits and routine. The tracker is not meant to be a 'miracle solution', or something that will do the work for you. The individual must make the decision to be healthy and disciplined, and a tracker can be used as the reminder to 'get moving' and supply beneficial information as one goes about their workout routines.

While many people are motivated to exercise so that they lose weight, ultimately that is a poor goal. Brownstein points out something very important, "Exercise, has many health benefits and is an important part of a healthy lifestyle, but some of those benefits, such as those that apply to metabolism and heart disease, are independent of weight loss, so focusing on weight alone is simplistic" (Brownstein, 2014, para. 12). In the end it is important to realize that no matter what the numbers are, that one has gone out there and done their best. It is all about living healthfully and deciding to change ones lifestyle. If you are feeling better, happier, have more energy then

you are being successful. Is it a bonus to lose weight along the way and have data to back it up?

Of course!

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