Health and Fitness App Use in College Students: A Qualitative Study

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Background: College students experience weight gain that can contribute to serious health issues. Health education efforts with college students are increasingly utilizing new technologies. Smartphone applications (apps) in particular are growing in popularity and use in all young adults. Purpose: Formative research was conducted to describe how college students in the southwestern United States use health/fitness apps to change behavior. Method: College students (n = 27) ages 18-30 reporting use of health/fitness apps were recruited on a large public university campus and participated in interviews about app choice, behavioral goals, features, and reasons for continued use. Interviews were recorded, transcribed, and analyzed for themes using a 4-person coding team and the qualitative research software NVivo. Results: Most participants downloaded an app to meet a goal and felt that the app helped them meet it. Two distinct groups emerged, those who used apps to support an established behavior and those who used them to adopt a new behavior. The majority of participants reported that acceptable apps were free, easy to use, provided visual/auditory cues, and had game-like rewards. Most participants strongly opposed linking their social media with apps and did not use those features. Discussion: College students use apps to meet different goals such as developing an exercise routine or improving eating habits. Examining what influences health/fitness app choices among college students may provide important insights for future interventions developed to promote app use over long periods of time. Translation to Health Education Practice: Health education programming may benefit from the use of apps, because college students are already adopting these technologies. Features that are important such as ease of use and game-like rewards can help health educators choose appropriate apps for college student programs.

BACKGROUND

Obesity in the United States continues to contribute to a number of serious health issues such as cardiovascular disease, stroke, diabetes, and even some cancers.1-3 For the majority of states in the United States, obesity rates for young adults (18-25) are between 15% and 20%, with a few states already reporting rates as high as those for adults.4 As young people make the transition into adulthood, a number of influences can impact maintenance and/or adoption of health behaviors, which can lead to weight gain.5,6 College students are at particularly high risk of weight gain, with estimates between 4 and 9 pounds in the first year of college.7 In addition, weight gain in college students does not stop with the first year but compounds over the entire time a young adult is in college.8,9

Health educators have adopted new technologies as potential tools for addressing a variety of health issues.10-13 The Internet and text messaging have both been used for chronic disease management and health promotion interventions and as a way to connect with program participants.14-17 In addition, newer options such as smartphone apps and social media are beginning to be tested as potential tools for behavior change.18-21

Smartphones in particular offer the ability to connect with people through all of the technologies mentioned above. Smartphone ownership has grown significantly in recent years, particularly among young adults. Around 79% of young adults, regardless of income, are likely to own a
smartphone.22 Young adults are also more likely than any other age group to use their phones to look for health information, and approximately 24% of them use apps for tracking or managing their health. The 3 most popular types of health and fitness apps are exercise/fitness apps (38%), nutrition/calorie counter apps (31%), and weight loss apps (12%).23

PURPOSE

The popularity and availability of health and fitness apps provides an opportunity for health educators to incorporate these free or low-cost resources into programming. However, few studies have explored the use of existing health and fitness apps, and those that have investigated apps failed to explore independent acquisition and use of apps.24,25 For example, one study evaluated reasons for adopting health apps through 2 main predictors, perceived usefulness and perceived ease of use.24 The participants were not current app users but were provided with instructions for evaluating 2 preselected existing apps. Then they were given a survey that measured perceived usefulness, perceived ease of use, intention to use health apps, and other items related to the model used. The results indicated that perceived usefulness impacted the intention to use a health app, but perceived ease of use did not.24

Another example is a study that explored adults’ (ages 18-50) perceptions of health apps through focus groups.25 Participants were provided with examples of particular features found in health and fitness apps and reported their thoughts and feelings regarding the features. Participants reported that accuracy, legitimacy, security, effort required, and effects on mood influence app use. In addition, they reported tracking behavior and goals as valuable features, but context sensing and social media components were considered unnecessary.25

Though the current literature provides valuable information regarding health and fitness apps, there is more to learn about apps and the primary users of these apps. The current research has yet to focus on the already established college student user of health and fitness apps, thus leaving a gap in the research. Students born after 1980 are often called digital natives in education because of their use of a variety of technologies throughout their life.26,27 This technologically savvy segment of the population speaks the language of computers, the Internet, videos, social media, etc., and has different expectations of technology than previous generations. In order to properly use apps in programming, the way this group of users acquires and uses apps should be explored. This exploratory study examined app use with young adult college students who had downloaded and used an app on their own. The primary purpose of exploring existing app use is to observe this group’s preferences and choices regarding apps to add to the small research base available to health educators who wish to engage college students through technology.

METHODS

Interview Design

To explore established health and fitness app users’ experiences a qualitative interview approach was used. One-on-one semistructured interviews were chosen so that participants would feel comfortable speaking openly about health and fitness behaviors. Interview questions were based on a review of the current literature24,25,28,29 and reviewed by a convenience sample of young adult college students who provided feedback on content and how questions were worded. A brief demographic sheet was also created to capture basic information from participants before the interview began. In addition to the survey, at the beginning of the interview participants were asked about their favorite app and what health and fitness apps they currently had on their phones. The University Institutional Review Board approved all study components prior to initiation of the study.

Sample and Recruitment

Participants were recruited at a large public university in the southwestern United States through posters placed in high traffic locations on and near the campus and through announcements in classes not taught by the authors. Recruitment posters were not posted in buildings housing health or wellness departments. Participants had to be between 18 and 30 years old and have an app on their smartphone related to nutrition, physical activity, or both. Potential participants who had other health-related applications such as symptom checkers, period trackers, or sleep monitors were excluded from the study. A saturation sampling strategy was used for this study. Saturation sampling is a qualitative sampling strategy where participants are continually recruited until nothing new is being learned from the interviews.30,31 This strategy was chosen because it lends to the emergent nature of qualitative inquiry and allows for simultaneous data collection and analysis.

Data Collection

Participants who met the inclusion criteria were scheduled for a confidential interview at their convenience. The first and third authors conducted interviews, along with a research assistant. Upon arrival, participants signed an informed consent and completed the demographic survey. Participants were asked open-ended questions regarding their health and fitness app use, and interviews lasted between 15 and 50 minutes. All interviews were recorded.
using handheld recorders, and participants received a $15 store gift card to thank them for their time. Twenty-seven participants were interviewed. The research team agreed at interview 24 that the interviews were nearing saturation and decided to conduct an additional 3 interviews to confirm saturation.

Data Analysis

Grounded theory was used to guide the analysis of the interviews. The use of grounded theory allowed for participant perspectives to emerge without the bias of an established theory influencing the emerging themes. This aided in the saturation sampling approach and provided a systematic structure for analysis.31 Interviews were transcribed, checked for accuracy, and then analyzed using NVivo v.10 (QSR International, Victoria, Australia). The first author created the code book after reviewing the transcribed interviews multiple times. The research team reviewed the codes and provided suggestions for additional codes. Team members coded the initial interview independently and then met to review the coded interview to achieve consistency in coding.32 There was a high level of agreement among the 4 coders and any differences were discussed until consensus was reached. All 4 authors coded the remaining interviews independently. The authors met to review the coding and discussed any differences in coding until consensus was reached. This allowed for coders to determine any discrepancies in coding and to remove from the coded documents any coding that was not purposeful.32 Once coding was completed, the research team reviewed all the interviews and codes for crosscutting themes.30-32 It was determined a priori that one quarter (25%) of the interviews would need to refer to a topic for it to be considered a theme. Once theme identification was completed, team members reviewed the material for confirmation of each theme and for any additional themes that may have been overlooked during theme identification.30-32 Following finalization of the themes, the interviews were reviewed again to search for disconfirming evidence of the themes.32 Upon finalization of themes, representative quotes were chosen to illustrate the theme.

RESULTS

The results of the demographic survey are presented in Table 1. Ninety-two percent of participants identified as white. Seventy-eight percent were female and the average age of participants was twenty. Most participants reported using an iPhone, but all of the apps reported on by participants are available through multiple outlets (i.e., iTunes, Google Play, etc.) and for multiple phones.

Most participants had more than one health and fitness app, and therefore were asked to share feelings about the one they used the most (see Table 2). There was a great deal of variety in the apps that the participants reported using. However, MyFitnessPal, LoseIt!, and RunKeeper were the top 3 reported. The amount of time that participants reported using their app ranged from as little as 1 month to more than a year, with 37% reporting app use of over a year. Multiple themes related to acquiring the app, using the app, and likes/dislikes about the app were identified through the analysis of the interviews.

Almost half of participants said that they found out about the app from a family member or friend. Those who found out about the app from family members typically used the app along with the family member and expressed positive feelings about doing so. Most of the remaining participants found the app on the web primarily at the app store.

Well I haven’t really tried any of the other ones, this was just kind of the one that my mom used so I don’t think anything really appealed to me more than just she was using it and she’s not really technologically advanced so it must be kinda easy to use (Participant 16)
TABLE 2
App Type and Length of Use Results

<table>
<thead>
<tr>
<th>Topic</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reported health and fitness apps</td>
<td></td>
</tr>
<tr>
<td>MyFitnessPal</td>
<td>8 (29.6)</td>
</tr>
<tr>
<td>Lose It!</td>
<td>3 (11.1)</td>
</tr>
<tr>
<td>RunKeeper</td>
<td>3 (11.1)</td>
</tr>
<tr>
<td>MapMyRun</td>
<td>2 (7.4)</td>
</tr>
<tr>
<td>Calorie Count</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>Strava</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>MyPlate</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>N+TC (Nike Training Club)</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>Endomondo</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>Nike+Running</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>SmartRunner</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>Workout Trainer</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>Steps Pedometer</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>Couch to 5k</td>
<td>1 (3.7)</td>
</tr>
<tr>
<td>Length of time using app</td>
<td></td>
</tr>
<tr>
<td>0 to 3 Months</td>
<td>7 (25.9)</td>
</tr>
<tr>
<td>3 to 6 Months</td>
<td>5 (18.5)</td>
</tr>
<tr>
<td>6 to 9 Months</td>
<td>3 (11.1)</td>
</tr>
<tr>
<td>9 to 12 Months</td>
<td>2 (7.4)</td>
</tr>
<tr>
<td>12+ Months</td>
<td>10 (37.0)</td>
</tr>
</tbody>
</table>

* These results were taken from questions asked during the interview, not survey data.
* Participants may have had multiple apps but only reported on the app they used the most.

I think I just typed in like calorie counter, or maybe like health app or something like that, just in the search thing. (Participant 4)

Approximately half of the participants said that they would not consider downloading an app that cost any amount of money. The remaining half of participants said that they would consider purchasing an app if they knew it was good but that they would prefer not to purchase apps. Several participants indicated that there was no reason to purchase apps because there is almost always a free option.

As long as it’s not more than like 1.99, I will like pay, like it’s fine. But, like, I don’t want to pay for anything that’s more than that. I just, not unless I’m going to use it like every single second, I’m not going to pay for it. (Participant 15)

I wouldn’t pay money for an app. I think that’s kinda stupid (Participant 21)

Participants indicated that apps with excessive data entry for sign up, complicated operating procedures, or features that required instructions were unacceptable and would not be downloaded. If these apps were downloaded, they were deleted and replaced with an app that was easy to use.

I actually downloaded like multiple apps at one time so I downloaded MyFitnessPal, Livestrong, MyPlate and I kinda tried them all out and the reason I liked MyFitnessPal the most and deemed the other ones ineffective for me was because I can just easily scan things in and it was just easy to track things, easy to put it in. I can create my own foods, I would say probably its accessibility and easiness. (Participant 19)

I really loved it [Couch to 5K], there was no excessive login, it was really easy you just downloaded and start you have to have your email, no password, no nothing like that, they don’t send you a bunch emails that annoy the crap out of me. Nothing. (Participant 26)

Participants were asked about their favorite apps prior to discussing their health and fitness apps. Approximately three quarters of participants indicated that social media apps were their favorite apps. Most of these participants stated that Instagram was their favorite, followed by Facebook. Many health and fitness apps have the ability to connect with these types of social media. Participants were asked whether they ever shared their health and fitness behaviors on social media. About half of the participants said that they did not and would not use the social media in the app because they did not feel that it was appropriate to mix their health and fitness behaviors with their social media activities. The remaining half did not object to using the social media functions, but most did not actually use them.

Yeah you can share on Facebook and stuff, but I hate that. I hate when apps sync to like every form of social media. I’m like really weird about social media, so, no I don’t want to share it. (Participant 11)

It can be hard to like if you know other people who are like, “No you don’t need to lose weight,” or just, I don’t tend to share. I don’t like to connect my social media together, and that’s one of the big ways people do that. (Participant 12)

The majority of participants utilized the app with a specific goal in mind. The 3 most common goals were physical activity/exercise, nutrition/healthy eating, and weight loss. Over half of the participants indicated having a physical activity/exercise goal such as increasing time or distance when running, learning new exercises, or increasing their fitness level. Participants indicating a nutrition/healthy eating goal made up the majority of the remaining half and they expressed using the app to count calories or see what they were eating. Most of the participants with a goal believed that they met their goal and that the app helped them in achieving it.

I think so for sure, um, it has definitely made me more aware of what foods you know maybe aren’t as good for me. So, like, bagel and cream cheese is my favorite breakfast ever. So it is not something that I should be eating on a daily basis and I probably wouldn’t have thought about that before I had the app and now that I can see that it’s like 270 calories for one bagel, I’m like ok, maybe not. (Participant 3)
Yeah I think it [Nike + Running] definitely did, and it kind of made me want to start running marathons. I’m gonna run a half in the spring. And so I think that app kind of, um, once I could visually see like how far I had run, just without training, I was able to be like I guess I could actually do that. So it did help me, um, run further. (Participant 11)

When asked about how the app helped them achieve their goals, participants explained how they felt that the app raised their awareness of the target behavior and provided encouragement or support, often through visual or auditory cues. Examples of visual cues were seeing the calories left for the day go from green to red when they went over their calories and then seeing them go back again when they exercised and burned calories or seeing the map of how far they went and their times when running. Auditory cues were hearing the app tell them they were almost done with a run or hearing the app provide encouragement to finish an exercise.

But it shows you, like, all the calories and then you can see there’s red cause I went over 286 calories (Participant 3)

And it gives nice little reminders, like if you want to run for only like 15 minutes every five minutes it will say, like, “five minutes have elapsed.” I think that’s really nice too, but, yeah, I think it has really everything that I need right now maybe for more serious runners it could be a little bit more complex but for me I just like exercise, so it’s, like, good. (Participant 6)

Two distinct groups of participants emerged from the sample, those using the app as a tool to support an existing behavior and those using it to adopt a new behavior. Approximately half of the participants were utilizing their app as a tool to support an already existing behavior. Many expressed that they wanted to get the app to make performing the behavior easier or to target specific factors related to the behavior. Some examples would be having established a healthy eating routine but using the app to encourage finishing an exercise.

Mostly kind of like track what I eat to kind of be aware of how many calories are in food ‘cause it has more foods and this is kinda how much you expect because you can’t always see that how things are divided out. And kind of to be more aware of what areas I eat too much of, like, do I eat too much fat or sugar and, how’s that weighted because it gives percentages. (Participant 12)

The remaining participants had at least one failed attempt at their chosen behavior prior to downloading the app. These participants indicated that they used the app to assist them in attempting to change their behavior. Some examples of this would be downloading the app to count calories for weight loss or downloading the app to attempt to adopt a new exercise or physical activity routine.

I always just, like, oh my belly, I just want to get rid of it. And my mom and I both tried different ways—middle school, high school—um, tried random weird diets. Diets where you don’t eat any meat at all or you don’t eat any carbs and we’d always end up getting it back ’cause those are foods we would eat normally. (Participant 1)

About half of the participants talked about the apps as if they were people and described them as providing both positive and negative reinforcement for their target behavior.

I’m really hungry, but I can’t eat more today because the app is telling me I can’t (Participant 12)

It’s like your own little motivator, in a way. And it definitely, it’s like, okay it’s like a little person, but it doesn’t talk, but it’s like, you shouldn’t eat that, or it’s like you should. So I don’t know it’s, I like it—I mean, I think it’s cool. It’s like my own little motivation. (Participant 15)

When discussing the apps, around three quarters of the participants reported positive feelings related to specific components of the apps. They indicated that they enjoyed the competitive elements provided by the app. Several participants described the app as being like a game or a challenge and expressed that they enjoyed the competitive elements provided by the app.

It’s just kind of cool because you get to see what you have done in the past and then it encourages you to do better things in the future. (Participant 6)

It made me want to exercise more just, as like, kinda like, a competition to see how many calories because it takes your calories off whenever you exercise so I’m like let’s see how many I can get off this time. (Participant 22)

About a quarter of the participants reported negative feelings about app components, but most of these participants also reported positive feelings as well. Participants discussed negative feelings related to their app use such as guilt, avoidance, shame, or feeling stressed. Some even verbalized this as not meeting the app’s expectations.

I’ll do something bad, and I’ll be ashamed to write it down, or, like, I just don’t want to know how many calories was in my pizza, so I’m not writing it down today. (Participant 5)

It’s definitely like . . . almost like a peer pressure feeling at first just because it’s got it right there in big bold letters that you kind of screwed up today. (Participant 7)

Some participants expressed becoming preoccupied with the app to a level that they felt was unhealthy. Participants talked about feeling as if they needed to eat less because of the app. Others discussed checking the app and logging foods or activities to the point where it became an obsession.
But I have learned this behavior of “you have to track everything or you’re going to get fat,” it really put me in a bad mindset and so it was like a complete cycle of eat something and then it was like, oh my gosh, I’m gonna get fat, so that I would like go to put it in real quick and then I was like okay I’m okay or it would lead to me like binge eating. (Participant 9)

It became more of like, let’s see if can eat less today and let’s see if I can eat less today and workout more so then that became like a competition and I’m really competitive so that’s where it became like an issue. (Participant 9)

DISCUSSION

The findings from this formative research provide a number of considerations for health education research and practice. Consistent with previous health and fitness app literature, participants reported strong feelings regarding the need for apps to be easy to use and free. Most participants indicated several times during the interview that ease of use was the most important app characteristic. They reported that if an app was not easy use, then it would simply be replaced with one that was from the other existing apps readily available. This was in contrast to one study that found that perceived ease of use did not impact intention to use an app. This difference could be due to the fact that the referenced study used participants who were not current app users or could also be because the 2 apps being tested in the study were top-rated apps that likely met the ease of use criteria for most users. In contrast, the current study only discussed apps that users independently found and used on their own.

In addition to ease of use, even a nominal cost presented a barrier for use. Many of the paid apps cost between $.99 and $1.99, arguably less than what most college students pay for a soft drink or coffee during their day. Still, participants reported this as a barrier, stating that because they had access to an abundance of free apps or a free version of the same app it seemed unnecessary to purchase apps. This finding may be due to the different expectations for technology that this age group has as a result of a lifetime of experience using these technologies. For health educators looking for ways to maintain a health behavior may also be a natural extension of themselves. They often referred to as digital natives because they have been using technology all their lives and see technology as a natural extension of themselves. They often build complex online networks of friends, colleagues, and others who share their personal interests. This blurring of the lines between in-person and online interaction may allow for them to view apps as just another extension of an already existing online network. More research is needed to allow for a better understanding of these comments and how they may impact health education programming.

One study found that participants expressed concerns about the negative feelings that might be elicited from app use, but in the current study participants who expressed negative feelings regarding some of their experiences with apps still had positive comments regarding app use for health and fitness. Health educators who choose to use apps should consider utilizing components that participants felt want to be “that kind of person,” meaning that they do not want to overshare online. Recent research has discussed the opportunities that social media can provide to health educators in terms of social support and capitalizing on the motivating aspects of competing against others. However, though social media is being used successfully in some areas of health education, the strong feelings expressed by participants in this study and other recent work suggest that physical activity and nutrition behaviors might be better supported by other health tools such as private messaging from a “coach” or periodic face to face meetings. More research needs to be conducted regarding college student feelings about social media as a health education tool. Health educators interested in utilizing social media should take into consideration their priority population and allow them a participatory role in determining how social media is used in any programming.

The self-reported nutrition and exercise behaviors of the participants in this study appear to indicate a high level of interest in health, which is not surprising because these are students who independently acquired and used a health and fitness app. This study identified 2 distinctive groups of app users that reflect 2 different segments that are actively seeking assistance from health and fitness apps. Both are important to recognize and will likely require different health education efforts. The users with an established behavior were actively seeking ways to stay engaged with or to increase an existing health behavior. Though most programming may be more focused on the group of users attempting a new behavior, this segment of established users looking for ways to maintain a health behavior may also be a group to engage because they are motivated to maintain the health behavior but may be looking for additional tools to assist in this task. Many participants actually spoke about their app as if it were a person and told interviewers that their app motivated them, coached them, and even sometimes guilted or shamed them into performing their target behavior. Young adults are often referred to as digital natives because they have been using technology all their lives and see technology as a natural extension of themselves. They often build complex online networks of friends, colleagues, and others who share their personal interests. This blurring of the lines between in-person and online interaction may allow for them to view apps as just another extension of an already existing online network. More research is needed to allow for a better understanding of these comments and how they may impact health education programming.
positively impacted them such as the visual and auditory cues that supported participant self-monitoring and/or goal setting. The potential for some participants to become preoccupied with the app and its features may have a negative impact on their health. In addition, more research should be done regarding both the positive and negative reactions participants had to health and fitness apps.

Health educators who would like to use health and fitness apps should carefully consider the behavior change goals and the apps they will be using. In addition, how participants are expected to use a chosen app deserves exploration. For example, those who are adopting a new behavior may have different needs from an app than those who are looking to maintain or improve an existing health behavior. Though many apps are capable of providing support to both groups, the components that participants may want to use could differ greatly.

Participants from both groups in this study reported varied ways of using the same app, so much so that there were no specific themes related to how individual users were using the app for their personal goals. One reason for this may be that, unlike the referenced studies, all of the participants in this study reported only on what features they were currently using with their chosen app. In the other studies, participants were provided preselected apps or prompted with examples of features from multiple apps and asked how they would use the features. Furthermore, health educators interested in using social media in conjunction with the app should consider the mixed messages in the literature regarding whether or not social media is an appropriate option for college students and should extensively test any social media components with their audience prior to use. Further exploration of social media components with diverse populations is also warranted before social media use is adopted.

This study has some limitations. The study presented here was conducted as formative research into health and fitness application use in college students and should be expanded upon in future studies. The participants in this study reported on a variety of apps, rather than one particular app. This limits the ability of the study to recommend specific apps for use in health education. However, many of the apps feature similar components and participants reported on components that they liked/disliked, which can provide useful information for health education efforts seeking to use apps. The sample was predominately female, and the majority of participants self-identified as White. Two of the authors did not conduct any interviews and were unaware of the demographics of the sample. These authors were asked to review the transcripts to determine whether they could identify responses based on sex. They found that they could not discern any differences in the responses of male vs. female participants. Therefore, we believe that the sample can be seen as representative of both sexes. However, future research with a more diverse population of college students could provide different patterns of use for health and fitness apps. Sampling other ethnic groups and more males could provide new information that would be useful to health educators working with diverse college populations. In addition, other groups such as young adults who went straight into the workforce or young adults who are older (25-30) and may have finished college could provide more useful information for health education efforts.

TRANSLATION TO HEALTH EDUCATION PRACTICE

College students are already using existing health and fitness apps and therefore are an ideal population to utilize these tools as part of health education programming. This study explored established health and fitness app use among this group by exploring participant feelings regarding how they choose apps, how they are using them to meet behavioral goals, and which features they find appealing. Future research on existing apps should expand upon this preliminary study and focus on how to use apps in health education programming in a successful way that meets the needs of those initiating a new behavior and those trying to sustain one. Health educators seeking to use apps in programming should pay particular attention to ease of use, cost, and whether or not participants are open to the use of additional features such as social media. Both researchers and practitioners should consider allowing participants an active role in choosing the apps that are used and deciding how they are used, because this group has strong opinions about what is acceptable and will most likely discontinue use if their needs are not met.

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REFERENCES


