Fitness on Facebook: Advertisements Generated in Response to Profile Content

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Abstract

Obesity is a challenging problem affecting almost half of college students. To solve this complex health problem, innovative approaches must be utilized. Over 94 percent of college students maintain a Facebook profile, providing them a venue to publicly disclose current fitness behaviors. Displayed advertisements on Facebook are tailored to profile content and may influence college students' fitness efforts. Facebook may be an innovative venue for improving college students' fitness behaviors. The purpose of this project was to determine (a) how and to what extent college students are discussing fitness on Facebook, and (b) how user-generated fitness information is linked to advertisements for fitness products and advice. First, public Facebook profiles of individual college students were evaluated for displayed fitness references based on 10 fitness behavior categories. Inter-rator reliability between two coders was 91.18 percent. Second, 10 fitness status updates were generated and posted by a researcher on a Facebook profile; the first 40 linked advertisements to these statements were examined. Advertisements were categorized and then examined for relevance to the college population. A total of 57 individual profiles were examined; owners had an average age of 18.3 years ($SD=0.51$), and 36.8 percent were women. About 71.9 percent of profiles referenced one or more fitness behavior; 97.6 percent referenced exercise, 4.9 percent dieting, and 4.9 percent unhealthy eating. Among the first 40 ads linked to generated status updates, 40.3 percent were fitness related. Most advertisements were for charity runs (30.4 percent), fitness apparel (24.2 percent), or fad diets (9.9 percent). Students referred both healthy and unhealthy fitness behaviors on their Facebook profiles, and these trigger the display of fitness-related advertisements of which few appear applicable. A community- or university-based intervention could be designed and implemented to provide relevant and tailored information to students on Facebook.

Introduction

APPROXIMATELY 31 PERCENT OF college students are overweight or obese,¹ and many adolescents who become obese during college remain obese as adults.² In college, adolescents gain independence and establish their own exercise and nutrition habits³; however, these habits may not improve fitness.^{1,4} Many college students have poor diets and are physically inactive.^{1,4} College students who are overweight report trying to lose weight through exercise and diet, but often the practices these students utilize to lose weight are not healthy.⁵

Two important influences on college students' health behaviors are peers and the media.^{6,7} Peer influences are among the strongest influences on body image, particularly in women.⁶ College students may seek advice from peers or model peers' fitness efforts. Individuals may even share unhealthy eating habits, as previous research illustrates that overweight individuals are more likely to have overweight friends.⁸

Along with peers, many college students are also influenced by media messages. The media practice model argues that adolescents choose and interact with media based on both who they are, and who they want to be.⁹ Thus, adolescents who view media messages about fitness may do so either, because they already see themselves as someone dedicated to fitness, or because they are making efforts to become more fit. Frequent viewing of media messages increases the likelihood of the adoption of ideas or beliefs, which may influence subsequent behavior.⁷ According to the social learning theory, adolescents learn not only from their own experience but also from watching other's experiences and imitating what they see.¹⁰ Several forms of media may impact college students, including advertisements and social networking sites. Previous studies illustrate that exposure to junk food advertising impacts adolescents' food beliefs and preferences.^{11,12} Given the large volume of food-related content online, this allows for the potential to significantly expand adolescents' exposure to food-marketing messages.¹³ Conversely, advertising healthy

foods can improve attitudes toward healthy food and increase selection of healthy snacks.¹⁴

Social media Websites also influence college students. Facebook is a popular social networking site that allows profile owners to create a personal profile that includes the opportunity to display photographs and status updates.¹⁵ Through status updates, profile owners generate messages about their current feelings, whereabouts, or actions for others to see. Therefore, Facebook displays may influence this generation's views of fitness and appropriate nutrition by both peer displays and online advertisements.

Because Facebook strives to show "relevant and interesting advertisements to profile owners based on their likes, interests, and comments,"¹⁶ college students are being shown advertised content on Facebook that directly correlates with the information they choose to share on their personal profiles.¹⁶ Companies can target the advertisement's location by sex, age, keyword, relationship status, job title, workplace, or college.¹⁶ Advertisements on Facebook can pair an advertiser's message with social actions taken by the profile owner,¹⁶ such as posting a status update. Thus, Facebook advertisements are prevalent, easily noted, and highly tailored. Given the potential for Facebook to provide displays from peers and the media, Facebook may be a powerful venue to influence the health behaviors of college students. However, an evaluation of what that content may be has not yet been pursued.

The purpose of this study was to evaluate the displayed content regarding fitness on Facebook. Our first aim was to evaluate the content displayed by profile owners in reference to their own personal fitness by looking at personal pictures and status updates posted by individuals. Our second aim was to evaluate the content of advertisements targeted to fitness keywords on Facebook.

Methods

This study was determined exempt by the University of Wisconsin Institutional Review Board. The study was conducted between September 2010 and October 2011. We conducted a content analysis at a single time point of Facebook profiles belonging to freshman college students.

Content evaluation of profile fitness references

Profile inclusion criteria. We evaluated publicly available Facebook profiles of undergraduate freshmen from a large state university. Profiles were selected for the study if their owners were between 18 and 20 years and showed evidence of activity on their profile within the last 30 days. Profiles were excluded if they were not undergraduates, did not meet the age criteria, had their profile security set to private, or did not have activity within the last month.

Profile selection. Using the Facebook search engine, search criteria for eligible profiles included the selected university and graduation year. This resulted in a display of numerous Facebook profiles belonging to college freshman. All profiles returned in the search results were evaluated sequentially for eligibility, resulting in a sample size of 60.

Codebook and variables. Profiles were evaluated using a research codebook. A codebook was created using a similar methodology to our previous codebooks that evaluate other health behaviors, such as alcohol and substance use.¹⁷ The categories, key words, and phrases used in the codebook were determined based on previous pilot studies that looked at common types of fitness references on individual profiles. The codebook included 10 unique categories of fitness-related behaviors to encompass a wide range of fitness-related

TABLE 1. CRITERIA FOR FITNESS-BEHAVIOR REFERENCES APPLIED TO FACEBOOK PROFILES ALONG WITH 10 GENERATED FACEBOOK STATUS UPDATES THAT WERE DIRECTLY CORRELATED WITH EACH OF THE 10 FITNESS-BEHAVIOR CATEGORIES

<i>Categories</i>	<i>Key words/phrases</i>	<i>Generated status update</i>
Over-eating	References to eating too much, feeling too full, etc: "ate way too much pizza last night"	"ate way too much today..."
Under-eating	References to avoiding eating, not having enough to eat, feeling really hungry, skipping meals: "diet not going well, will skip breakfast today"	"hasn't eaten all day..."
Poor eating habits	References to eating unhealthy foods, eating chips, sweets, soda, fast food: "all I've eaten today is a coke and three popartars"	"yesterday was fat Tuesday...I celebrated by eating junk food all day:)"
Nutrition/good eating habits	References to eating healthy: fruits, veggies, drinking water: "farmer's market this morning!," "best salad ever for lunch"	"I love carrots!"
Exercise	References to exercising, playing sports, photos of profile owner running or playing sports	"had a great workout at the gym this morning!"
Not exercising	References to avoiding exercising, not having motivation to exercise: "too lazy to work out"	"is too lazy to work-out today..."
Concerns about being underweight	References about not weighing enough, being too thin	"was turned away from giving blood today because I didn't weigh enough:("
Concerns about being overweight	References to being too fat, weighing too much	"spring break is over, and now I weigh too much"
Dieting/restricting food intake	References to going on a diet, or eating less than normal volitionally	"starting my diet today!!"
Negative body image	Not liking the way their body looks (other than referring to being too fat or skinny); "wishing I had more muscles"	"I look disgusting today."

behaviors, while trying to eliminate ambiguity between references (Table 1). For each Facebook profile that met inclusion criteria, demographic data and displayed fitness-related reference data were recorded, including the coder's typed description of any verbatim text from the profiles. Any identifying information of the profile owner was omitted to protect the profile owner's privacy.

Profile evaluation procedure. All profiles were examined by one of two trained coders. The coders viewed publicly accessible status updates to determine whether fitness-related references were present. Profiles were evaluated from the date of viewing to 1 year prior. A random subsample of profile references was evaluated by both coders to test inter-rater reliability. The overall agreement for categorization of the references was 90.12 percent between the two coders.

Content evaluation of generated advertisements

Test profile. To assess the content of advertisements on Facebook, a student researcher's individual Facebook profile was used to generate 10 fitness-related status updates that directly correlated to the 10 fitness behavior categories used to code the publically available profiles of freshman students (Table 1).

Procedure. Each time, the Facebook page was refreshed after the fitness status update was generated, and advertisements that were displayed were recorded. Consistent with the Facebook's design at the time of this study, four different advertisements were displayed after each page refresh within the Facebook Website. Pilot evaluations suggested that an average of 10 page refreshes in a given Facebook setting is typical for an average Facebook user. Advertisements were recorded after each one of 10 successive page refreshes within the Facebook site, which resulted in a total of 40 advertisements for each of the 10 status updates. Ten profile refreshes allowed for a substantial amount of advertisements to be generated without excessive redundancy. An additional 10 nonfitness-related status updates were generated by the researcher to determine if the content of advertisements differed between fitness and nonfitness posts. Forty advertisements were again recorded and assessed as described previously.

Results

Profile information

Sixty individual profiles of UW-Madison undergraduate freshmen were examined. Three profiles were excluded during the data collection process due to changes in privacy settings that did not allow the reviewer to see the owner's wall posts. The final sample size was 57. Each profile was examined twice through the course of the study, and all profiles examined were publically available. Thirty-six of the examined profiles belonged to men and 21 to women. The average age of the profile owners was 18.3 years ($SD=0.51$).

Profile evaluation

Overall, 71.9 percent ($n=41$) of profiles evaluated referenced one or more of the 10 fitness behavior categories. Most of the profiles referenced more than one fitness category, such

as exercise and good eating habits. About 70.2 percent of profiles referenced exercise and 12.3 percent of profiles referenced the theme of poor diet. Poor diet encompassed the categories of over-eating, under-eating, and poor eating habits. Of the profiles that referenced fitness, 97.6 percent were exercise references, 4.9 percent dieting, and 2.4 percent nutrition or good eating habits (Fig. 1).

Ad evaluation

From each profile, we evaluated 40 advertisements for each of 20 status updates; thus, a total of 800 advertisements were assessed; 40.3 percent of the first 40 advertisements displayed in response to a fitness-related status update were also fitness-related. About 30.4 percent of advertisements were for charity runs, such as the Warrior Dash and the Tau Beta Pi-Pi Mile Run, 24.2 percent for fitness apparel or equipment, such as Sugoi cycling and running apparel and Nike shoes, and 9.9 percent of the advertisements were for fad dieting programs, such as 1 Trick to a Skinny Stomach and the Fat Burning Furnace. Examples of advertisements displayed can be seen in Figure 2.

The status update that generated the greatest proportion of fitness-related advertisements mentioned being underweight. The status update created read: "was turned away from giving blood today because I didn't weigh enough:". Approximately 67.5 percent of the first 40 advertisements generated after the underweight status update was created were fitness related. Examples of advertisements displayed in response included the Trek Store, Tom's shoe store, and the Fat Burning Furnace.

When assessing the content of advertisements displayed after nonfitness status updates were created, it was found that only 30 percent of the first 40 advertisements displayed were fitness related. Many ads that were generated referenced recipes for sweets or candy, rather than dieting tips or strictly healthy food options. For example, advertisements were generated advertising the "Just A Pinch Recipe Club," which included recipes for crock pot candy, pineapple walnut cake, and an apple Bundt cake.

FIG. 1. Flow chart showing percentage of profiles displaying fitness references on Facebook.

FIG. 2. Examples of advertisements displayed on Facebook in response to fitness-related profile content.

Discussion

Our findings illustrate that fitness is a common topic on Facebook. Overall, over 70 percent of evaluated profiles referenced fitness behaviors on Facebook, with most referencing physical activity. Findings also illustrate that fitness, specifically, is a topic in which Facebook recognizes and tailors advertisements by pairing specific key words or phrases within the generated status updates.

While fitness-related information is displayed on Facebook, much of the information is irrelevant to college students as it is either expensive, such as work-out gear, or not accessible on a college campus. For example, many of the fitness-related advertisements generated in response to status updates were for charity runs across various states, which may be cost prohibitive for most college students. Further, many advertisements were for unhealthy fad diets or junk food. Possibly, the most alarming finding from this study was that the status update generating the most fitness-related advertisements referenced being underweight. Not only did this status update generate the most fitness-related advertisements but it also generated advertisements such as the Fat Burning Furnace, aimed toward losing weight. This shows that advertisements are paired to fitness key words, but are most likely displayed nonspecifically, linked to keywords such as “weight” rather than true content. For example, posting a status update about wanting to diet (i.e., “Starting my diet today, no more chocolate for me!”) may generate an advertisement for candy and other junk food, because a junk food advertiser has targeted the keyword chocolate.

Thus, the current advertisements on Facebook displayed in response to fitness-related status updates are not age appropriate or necessarily healthy. This leaves room for much improvement and the possibility of creating age-appropriate and health promoting advertisements that could help improve adolescent fitness. These advertisements could take the form of workout routines or healthy recipe ideas for college students living in the dorm. As Facebook advertisements are also very affordable, the creation and display of these targeted fitness advertisements could be undertaken by a university health service. Facebook advertisements include data regarding viewing rates, which could serve as assessment

data for an evaluation. As Facebook is a popular venue for college students to discuss their current fitness behaviors, future directions could also include the creation of an online group for college students on Facebook that would provide healthy eating and exercise tips.

Acknowledgments

This project was supported by the Award Number K12HD055894 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development. The author would like to thank Rosalind Koff, Megan Pumper, and Angela Davis for their help with data collection and analysis.

Author Disclosure Statement

No competing financial interests exist for either author.

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