

A Picture May Be Worth a Thousand Texts: Obese Adolescents' Perspectives on a Modified Photovoice Activity To Aid Weight Loss

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Abstract

Background: In an effort to enhance the vividness and personal relevance of a text messaging intervention to promote weight loss among obese adolescents, a modified Photovoice process was evaluated with adolescents in a weight management program.

Methods: Photovoice is a method using photography to generate relevant images and stories from users. Participants were recruited from the Michigan Pediatric Outpatient Weight Evaluation and Reduction (MPOWER) program, a multidisciplinary weight management program for obese adolescents and their parents. Twenty-three adolescents with a mean BMI of 40 were asked to take pictures on three to five randomly assigned weight-related topics, such as “something that reminds you to exercise,” and to text them to a research assistant. Adolescents then engaged in semistructured interviews about the experience. Detailed notes of the interviews were analyzed to identify themes.

Results: Participants generally provided high ratings of the process, indicating that (1) deciding what pictures to take caused them to reflect on their weight loss experience, and (2) a mobile intervention incorporating personally relevant images (*e.g.*, basketball as their favorite sport rather than sports in general) would increase treatment adherence. The submitted photographs frequently featured family members and friends, and participants indicated that family and friends played a major role in motivating and supporting them.

Conclusions: This study suggests that a Photovoice component has the potential to enhance weight management programs for teens as part of a text messaging intervention and as an independent entity. Further work should evaluate the effect of this promising intervention on weight loss.

Introduction

Obesity is considered one of the most important public health concerns of our time.¹⁻⁴ Due to the dramatic increase in the prevalence of childhood obesity, millions of American adolescents are at risk for becoming obese adults and of developing a host of obesity-related illnesses.⁵⁻⁷ To counteract this epidemic, the American Academy of Pediatrics recommends multidisciplinary weight control interventions when primary care efforts have failed to achieve adequate results.⁸ Most multidisciplinary programs, however, have only met with moderate success.^{9,10} Consequently, it is important to

explore ways to improve treatment outcomes.

Stronger longitudinal engagement with individuals participating in behavior change programs and avoidance of attrition are thought to be related to outcomes.^{11,12} The requirement of regular in-person contact, however, increases program attrition, reducing the opportunity for long-term engagement.¹³ Interactive communications technology, such as short message system (SMS) text messages, offers a means of engagement between in-person visits without significantly increasing participant burden. For this contact to improve motivation, decrease treatment attrition, promote healthy choices, and enhance weight loss, it is important that the content of the mes-

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sages is personally relevant to users.¹⁴ This personal relevance may be enhanced by tailoring interventions to participants' individual characteristics and interests.

In one prior study incorporating weight-related messages sent to adolescents' pagers, the messages were viewed as having a positive impact, but one-third of the participants indicated that the messages became boring over time.¹⁵ In a subsequent study using phone messages with a combination of text alone and text with images, obese adolescents viewed the images as the most positive element of the intervention.¹⁶ This study uses a variation of the Photovoice method to explore the types of images that obese adolescents believe would be helpful in supporting their weight loss efforts. More relevant, engaging phone messaging will then provide an adjunct to an intensive weight loss program.

Methods

Study Design

The study design was a single-site modified Photovoice intervention. Photovoice is a largely self-directed process in which participants take pictures of surroundings and experiences that reflect the strengths and concerns of their community.¹⁷ In its most traditional form, Photovoice is a digital community-based participatory research methodology that uses photographs to capture unique individual perspectives on a topic of interest that are then discussed as a group; the results are used to inform policy

initiatives.¹⁸ For this project, we modified the traditional Photovoice methodology by guiding participants to take pictures specifically focused on weight-related topics. Furthermore, the purpose of taking the images was to enhance individual weight loss efforts rather than to inform community level policies.

Due to the absence of previous data on this topic, a hypothesis-generating qualitative approach utilizing semi-structured interviews was used to explore participants' perspectives regarding the experience. This approach was intended to allow participants to provide their thoughts in their own voice, avoiding perceived demand characteristics of a group. The study protocol was approved by the Institutional Review Board of the University of Michigan Medical School.

Recruitment

In the summer of 2010, Michigan Pediatric Outpatient Weight Evaluation and Reduction (MPOWER) program patients were invited by e-mail and/or flyer to participate in this modified Photovoice project. Participants in the MPOWER program are typically adolescents between 13 and 19 years old and have a BMI $\geq 95^{\text{th}}$ percentile. Consent to participate was obtained from parents and assent from the adolescents. Adolescents were compensated with a \$20 gift card for participation. Participants were offered a mobile phone to use for this study if they did not have a phone with a camera, but no participants needed to be provided with a phone. In addition, reimbursement was available for participants' airtime, but due to the types of mobile phone plans they had, no participants required these funds.

Photograph Assignments

Each participant was asked to take pictures using their mobile phones related to three to five topics. The topics were randomly selected (from topics written on slips of paper and placed in a basket). There were 16 different topics (see Table 1), with selection continuing until each topic was assigned to at least 4 participants. The topics included in the photograph assignments were elicited from MPOWER adolescents in focus groups about the proposed text messaging intervention. Participants were instructed to take the pictures within 2 weeks and to send their pictures via text message to our research assistant. Once a participant's pictures were received, their semi-structured interview was scheduled.

Semistructured Interview Guide

A debriefing interview guide was developed which included both closed-ended and open-ended questions. The questions explored: (1) Participants' rating of the experience of participating in the project, (2) participants' perspectives regarding whether and how the pictures might help their weight loss efforts, and (3) the ways in which the pictures taken by the participants addressed the topics in the photograph assignments.

Table 1. List of Photo Assignments

Take a picture of:	
Focused assignments	
Exercise	Something active you like to do Something that reminds you to exercise
Nutrition	Favorite vegetable Favorite healthy drink
Support and inspiration	Someone who inspires you to be healthy Someone who supports you in being healthy
General assignments	
Motivation	Something that motivates you to be healthy Something that motivates you to lose weight Something that motivates you to eat less unhealthy food A reward you would get for accomplishing your goal Something that represents a goal you would like to achieve
Positive feelings	Something that you enjoy doing that is not related to food Something that makes you feel happy Something that gives you confidence or makes you feel good about yourself
Barriers and facilitators	Something that makes it easy to lose weight Something that makes it difficult to lose weight

Data Collection

Semistructured telephone interviews were performed by authors (S.K. and S.W.), following receipt of the pictures. The interviews ranged from 15 to 25 minutes in duration, and detailed notes were taken, with two investigators acting as scribes to ensure accurate data collection.

Data Management and Analysis

Interview notes were systematically analyzed using the constant comparative method by two authors independently to identify themes.¹⁹ Within the main topic areas to be explored, common experiences and patterns were identified and refined in an iterative process. Lists were made of participant comments related to each theme. From these lists, representative comments were selected for the purpose of illustration. After 16 interviews, no new responses emerged regarding these topics. Therefore, recruitment ended at this point. The study was terminated after completion of an additional seven interviews with adolescents who enrolled in the study prior to this point.

Results

Participant Demographics

Participants were mainly female (78%); 44% were non-Hispanic white (32% non-Hispanic black, 12% Arab American, 8% Hispanic, and 4% Native American Indian), and 35% were Medicaid enrollees. The average age was 14 years old (range 13–19), the average BMI at program entry was 40, and the median BMI percentile was the 99th percentile (range 96th to 100th percentile). Sixty-four percent of the adolescents in the study were within the first 3 months of participation in the MPOWER program. The largest proportion of adolescents in the study (46%) came from low-income families with a household income of \leq \$24,999 (\$25,000 to \$49,000 = 21%, \$50,000 to \$74,000 = 8%, \geq \$75,000 = 25%). Regarding maternal education, one-third of the participants' mothers had a bachelor's degree or higher, only 5% of mothers did not have a high school diploma.

The Photovoice Experience

The participants ($n = 23$) were universally enthusiastic about the experience of taking the pictures for this project. On a scale of 1 ("it was dreadful and I don't want to do it again") to 10 ("it was great and I'd like to do it all the time"), the average rating for the project was an 8.6 (range 7–10). The following quote is typical of the participants' statements about the project.

"I thought it was cool. The idea of it is cool, it keeps kids involved through the week, but not like homework, it's fun and easy. It reminded me of all the things being talked about [in the weight loss program]."

Technical Component

Most participants found the technical aspects of taking pictures and sending them as a text message from their phone to the research assistant very easy. Only one participant found it difficult to text the pictures, but that individual still gave a high rating to the idea of thinking about the questions and taking the pictures.

Reflection

In general, participants indicated that the process of trying to decide what picture to take helped them reflect on different aspects of their weight loss efforts. This theme emerged unprompted during the interviews, but was not elicited in response to specific open-ended questions. These reflections seemed to address three major themes—social support, self-esteem, and behavior changes.

Social support. The assignments that asked them to take a picture of *someone who supports you, something that motivates you, or someone who inspires you*, allowed participants to contemplate on and recognize their supporters, which they found encouraging and they indicated that it engendered positive feelings. The following quote is typical of the responses we received:

"It kind of opened my eyes, to think of and thank my friends and family for supporting me and reminding me to get healthy."

Self-esteem. Participants also indicated that during the Photovoice assignment they were able to recall the efforts they put into weight loss and this led them to have feelings of accomplishment.

"I took a picture of my running shoes, when I see the running shoes like that it makes me think 'when was the last time I was out?' Working out makes me push myself and feel good about myself."

Behavior changes. In addition, the Photovoice experience seemed to make participants more aware of their weight-related behaviors, including positive and negative changes in their habits, goals they have or plan to set, and improvements they aspire to make. Typical statements included:

"It made me realize I was spending way too much time on my iPod."

Picture Assignments

Participants sent pictorial responses to the topic assignments and then discussed these pictures in the semistructured interviews. The assignments fell into two general categories, those that were narrowly focused on a particular topic (*i.e.*, exercise, nutrition, and sources of support), and those with a more general focus (*i.e.*, motivation, positive feelings, and barriers and facilitators).

Narrowly focused assignments about:

Exercise. In response to the assignment to take pictures of *something active you like to do* the most com-

mon response consisted of pictures related to basketball but there was a wide diversity of pictures, ranging from horseback riding, to hula hooping, to folk dancing. Typical quotes about these pictures included:

“Anytime I see a picture of someone playing basketball, I think of me playing basketball & I want to get up & play.”

“I recently got into hula hooping. It’s actually a lot of work to keep up; it’s something fun I like to do.”

In response to questions about using the pictures they took versus general pictures in a subsequent mobile phone intervention, participants indicated that if they were sent a text with pictures of a random sport, it would be less likely to prompt them to exercise than if they were to receive an image of their favorite sport specifically.

Though participants were given the assignment to take a picture of *something that reminds you to exercise* the most common pictures taken were of family members who served as a reminder to exercise by presenting the participant with a reason to change their behaviors. For example:

“When I look at [my father] I see my entire dad’s side of the family, I want to be the one to break that chain (of being overweight).”

“I took a picture of my grandma because she’s sick right now so being healthy is one way not to end up like my grandma.”

Another participant sent a picture of himself taken prior to starting the program and stated:

“This is a picture that I have on my phone, of me, from a long time ago... Whenever I look at that picture, it reminds me to exercise, so I don’t go back to that.”

Nutrition. In response to the assignment to take pictures of their favorite vegetable and favorite healthy drink, most participants took pictures of water, sugar-free beverages, and green leafy vegetables. When asked what, if any, effect receiving their picture in a subsequent text message would have on them, most participants noted that it would prompt them to eat or drink these items because they are ones they like.

“It’s a picture of broccoli, it’s my favorite vegetable. I can eat it raw or boiled. If I saw this picture it would make me want to crave it.”

Sources of support and inspiration. The assignments requesting pictures of *someone who supports you to be healthy* and *someone who inspires you to be healthy*, were almost equally split between friends and family members with mothers being the most commonly photographed family member.

“I took a picture of my mom because through the whole thing she’s been pushing me to go outside and exercise more and she’s been there for me the whole time.”

“Being around my family is like being around a healthy environment.”

“I took a picture of my friend, because she also struggles with weight. She inspires me because she tries to eat healthy too.”

General picture assignments about:

Motivation. We attempted to explore images that might serve specifically as a source of motivation by asking participants to take pictures of *things that motivate you to be healthy, lose weight, eat less unhealthy food, remember your goals*, and pictures of *rewards you would like to receive for accomplishing your goals*. Mothers and friends were the most commonly included subjects for pictures related to motivation. Participants emphasized the support they received from these sources in relation to their weight loss efforts. Typical quotes stated:

“I took a picture of my mom because she always reminds me to exercise and says, ‘Oh make sure you’re eating healthy.’ My mom’s the only person who really helps me.”

“[My friends] help me and redirect me, like if I want to eat something bad they would give me an apple instead.”

Other pictures illustrating sources of motivation included sports and clothes.

“I absolutely love sports but my favorite is basketball. I feel like if I got healthier, I would be able to be better at it.”

With regard to desired rewards, the adolescents sent pictures of a wide range of items, but again clothes and sports equipment were the most common. Even though the pictures were often similar for many participants, the reasons why the pictures served as a source of motivation were more specific. For example,

“I took a picture of the shirt with the small tag on it. I don’t like to go shopping and buy extra large clothes. If I saw this picture, it would probably encourage me to try to get to this size.”

Only one participant included a picture of money as a possible reward.

Positive feelings. In an effort to investigate images that would engender positive feelings among participants should they receive them in a subsequent text messaging intervention, we included assignments to take pictures of *something that you enjoy doing that is not related to food*, *something that makes you feel happy*, *something that*

gives you confidence or makes you feel good about yourself. In response to these assignments, most participants sent pictures of sporting activities. Typical quotes from the interviews about these pictures included:

“I feel like I’m on top of the world when I’m riding my bike.”

“I like the feeling I get when I’m running up and down the basketball court, like it’s for a purpose. I’m not just doing it for fun but it’s about helping me lose weight also.”

“I used to play on a softball team for a whole summer. This baseball and glove gives me confidence to know I can do sports, have fun, and do different things.”

Clothing was another source of confidence, as illustrated by this quote:

“This is a shirt, I chose it because it fits me and it has fit me for a year. It makes me feel smaller and gives me confidence. It makes me feel like I still have something that doesn’t make me feel huge. When I wear it to the mall, I feel like everyone else because when you’re overweight, whatever you wear makes you feel fat.”

Barriers and facilitators. To understand the different barriers and facilitators that impact participants’ ability to lose weight, we prompted them to take a picture of *something that makes it difficult to lose weight* and *something that makes it easy to lose weight*. Though the often-discussed barriers of sedentary interests such as television were included in the pictures, the most common barriers included in the pictures were unhealthy food items such as carbonated beverages and fast food restaurants.

“I work at [a fast food restaurant] and there is soooo much good food around—cookies, chips, drinks. It’s hard to control myself some days but I’m getting a lot better at it.”

“I took a picture of a pop bottle because my dad drinks a lot of pop so it’s hard when I see him drinking it.”

In regard to facilitators, the responses were quite heterogeneous, ranging from pictures of good weather to pictures of steamed vegetables.

“It would not necessarily remind me about vegetables, but remind me that there are small things I can do to help me.”

“Having it be nice out makes it easy to do fun activities like basketball, hanging out with friends, or walking. A lot of people don’t like to go out when it’s all snowy and stuff.”

Discussion

This is the first study to our knowledge that has explored the Photovoice method to improve engagement and retention among obese adolescents enrolled in an intensive weight management program. Adolescents who participated in this Photovoice pilot were enthusiastic about taking pictures in response to weight-related questions. Previous work suggests that adolescents liked phone messages that incorporated images.¹⁶ This study advances that finding to show that beyond receiving images, the adolescents in the study enjoyed, and believed they benefited from, actually thinking about and taking the pictures. They found the process of reflecting on the questions enlightening, and the fact that this reflection was linked to the fun activity of taking the picture made it an attractive endeavor.

Indeed, this study suggests that a Photovoice component also has the potential to enhance weight management programs for teens as an independent entity, unassociated with a text messaging intervention. In typical weight loss programs it is difficult to help adolescents engage in the reflective process that is an essential part of weight loss efforts. For example, self-monitoring activities such as logging are thought to be effective because they allow participants to reflect on their intake, but many adolescents find logging unpleasant. The Photovoice experience, however, seems to be an enjoyable way to encourage reflection. This may be due to linking the picture-taking process to thought-provoking questions. Therefore, it is important to select the questions carefully to guide participants to focus their thoughts on aspects of their experience that are likely to enhance their weight loss efforts. Providers might consider using Photovoice assignments intermittently throughout a multidisciplinary program, particularly at times when participants’ motivation appears to be waning and/or attendance is decreasing. This activity might help adolescents reconnect with the reasons why they want to lose weight. In this way, the Photovoice assignments might not only promote healthy behaviors but also increase engagement and retention in weight management programs.

When using the Photovoice activity as part of a text messaging intervention, one benefit of participants taking the pictures that will later be used in messages sent to them is that the images are by definition individually tailored. Previous behavioral studies have shown that individuals are more likely to engage in behavior change if they perceive the information they receive to be highly personally relevant.¹⁴ For example, the participants in this study repeatedly indicated that pictures showing their favorite sport would be more motivating than a general statement or picture about sport. Similarly, pictures including family members, particularly those causing them to make healthier choices in an effort to avoid the poor health that these adults experienced, were probably powerful because they were intensely personal.

Fortunately, with currently available communications and information technology, it is possible to develop a system for participants to submit their pictures that would then be automatically incorporated into specific text messages to be sent at a later date. The text accompanying the pictures would be targeted to the assignment used to prompt the patients to take the picture. So, for example, if the assignment was to *take a picture of something that motivates you to lose weight*, then the text message that would be sent back to the patient along with their picture might state “Sometimes it’s hard to make healthy choices, but always remember the reasons why you want to reach a healthy weight.” Because the messages will incorporate pictures the adolescents took themselves, they should have more ownership and therefore it may be more likely to keep them engaged.

There were a number of findings from this study that we did not expect. For example, when we asked the adolescents to send pictures of someone who inspired them, we expected to get pictures of celebrities. Instead, as with so many of the other questions, family members, specifically mothers, were central to the adolescents’ pictures. This underscores the important roles families must play in intensive weight management efforts for adolescents and suggests the possibility of targeting text messaging interventions to them or actively involving them in the Photovoice experience also.

Another unexpected finding was the role of sports in participants’ lives. Many of these obese teens linked their self-esteem to their ability to perform in organized sports and indicated that improving their performance was a major reason for wishing to lose weight. Further work is required to explore the relationship between sports performance, self-esteem, quality of life, and behavior change motivation among obese adolescents. This will help inform the development of the physical activity components of weight management programs.

In this study, we did not explore the effect of a modified Photovoice intervention on BMI. This will be explored in future work; however, many of the adolescents noted that participating in the study helped them think about why they were trying to make healthy changes and identify things that helped and hindered their efforts. Although we do not know if this process of reflection will actually lead to healthy behaviors, this increased insight, and provision of cues to action, may be a step toward improved adherence and ultimately weight loss.

Limitations

For this study, participants took pictures over a short period of time; whether their positive perceptions would be sustained if they had to take pictures over a longer-term intervention is unknown. In addition, the frequency with which they would enjoy taking these pictures should also be explored. We did not test the effect of sending the pictures back to participants in a text messaging intervention; this will be evaluated in the next step of this mul-

tiphase study. This was a small study, and the findings may not be representative of larger populations of obese adolescents. Furthermore, it was a novel experience for the participants that may have increased their positive views of the process. The themes identified in the study, however, seemed to be consistent over the majority of participants.

Conclusion

A modified Photovoice intervention may be a promising adjunct to obesity treatment for adolescents as part of a text messaging intervention, or as an independent entity. Adolescents perceived the process of taking pictures in response to weight-related questions as an enjoyable means of reflecting on their weight loss efforts and believed it would help them make healthier choices. The prominence of family members in the photographs taken by the adolescents suggests the significance of their families in their weight loss efforts, and may indicate the need to include them in future text messaging interventions. Further work is needed to evaluate the effect of a Photovoice intervention on achieving and sustaining a healthy BMI.

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Author Disclosure Statement

All authors report that no competing financial interests exist. The Principal Investigator had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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