

OMG Do Not Say LOL: Obese Adolescents' Perspectives on the Content of Text Messages to Enhance Weight Loss Efforts

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Adolescents participating in weight loss programs experience difficulty adhering to behavior change recommendations. Communications technology provides a low cost means to increase the frequency of contact with adolescents which can improve their engagement and also lead to behavior change. Within a larger project on the development of tailored text messages for adolescents enrolled in an existing multidisciplinary weight management program, this study explored participants' perspectives about message content. A library of messages was developed focused on topics central to weight management. Four focus groups were conducted with a total of 24 participants from the weight management program to gauge their reactions to the messages. Detailed notes from the focus groups were analyzed to assess the acceptability of individual messages and to identify overriding themes. Results indicate that participants were very enthusiastic about receiving text messages. They preferred messages that provided recipe ideas, included successful weight loss strategies used by peers, and requested feedback regarding their progress. They preferred positive, encouraging, and direct messages. They were unanimous that messages should include encouraging symbols (e.g., exclamation points and "smiley faces") as often as possible. They emphasized that any mention of unhealthy foods or behaviors would trigger them to eat those foods or engage in those behaviors. Text messaging acronyms (e.g., LOL) were considered too informal for messages from healthcare providers. This study suggests that including text messages in obesity interventions is acceptable to obese adolescents as a means of supporting their weight loss efforts, and it highlights the need for such messages to be carefully constructed.

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INTRODUCTION

The high prevalence of obesity among children and adolescents has made finding effective treatments a public health priority (1–5). Medical professionals on the front lines of treating childhood obesity face numerous challenges, such as limited time, poor reimbursement, and low self-efficacy (6,7). The American Academy of Pediatrics recommends multidisciplinary care when primary care efforts have failed to achieve satisfactory weight loss (8). However, multidisciplinary treatment programs have reported only modest effects and often suffer from high attrition rates and poor adherence to treatment recommendations (9,10). Thus, it is imperative to explore novel approaches to improve engagement in and efficacy of obesity treatment.

Text messaging interventions have been studied as a means of enhancing care for health conditions such as diabetes (11).

A recent pilot study by our group explored the use of text messaging as an adjunct to obesity treatment and showed that adolescents were enthusiastic about receiving messages from a weight management program and thought it would aid their weight loss efforts (12). This supported a previous study using messages sent to adolescents' pagers in which participants rated the experience positively (13). However, this study also revealed that one-third of the participants indicated that the messages became boring over time.

Due to the promising results seen in these earlier studies, we plan to conduct a randomized control trial to examine the impact of weight-related tailored text messages used in conjunction with a multidisciplinary weight management program, on change in BMI among obese adolescents. The goal of the text messaging intervention is to provide patients with

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cues to action and enhance motivation by sending weight-related text messages to their mobile phones, 1–3 times/day, over the course of a 6-month weight loss intervention. In addition, it is hoped that the messages will increase patient engagement, thereby decreasing the likelihood of attrition from the weight management program. However, to maximize the effectiveness of these messages, they must be engaging and salient. Therefore, as a preliminary step to the randomized control trial, the objective of this project was to explore adolescents' perspectives about the text messages that would ultimately be used in the randomized control trial.

METHODS AND PROCEDURES

Study design

For this qualitative pretest, which was performed before implementing the planned text messaging intervention, the focus was to explore obese adolescents' perspectives about the text messages. These messages will eventually be used to enhance participation in a weight management program and boost program efficacy. We employed qualitative methods to elicit participants' thoughts in their own voice, combined with an audience response system for participants to provide their feedback anonymously. In Spring 2010 four focus groups were conducted with obese adolescents in the Michigan Pediatric Outpatient Weight Evaluation and Reduction (MPOWER) program (14). Focus groups were small (4–8 adolescents) to facilitate in depth exploration of adolescents' thoughts and preferences about the text messages.

Recruitment

Adolescents in the MPOWER program (all of whom had a BMI >95th percentile for age and gender) were invited by email and/or flyer to participate in the focus groups. Consent to participate was obtained from parents and assent from the adolescents. Adolescents were compensated with a \$20 gift card for participation. Thirty adolescents agreed to participate in the focus groups, 24 actually participated. Those who did not attend cited scheduling conflicts as the primary reason for not attending.

Creation of text messages for testing

As a first step in this project, tailored and targeted text messages were developed by members of the research team. These messages focused on six evidenced-based behaviors that represent the core foci of the MPOWER program: breakfast consumption, increased consumption of fruits and vegetables, decreased consumption of sweetened beverages, decreased consumption of fast food, decreased screen time, and increased physical activity. We utilized gain-frame messages (messages focusing on how patients could benefit from a certain behavior) rather than loss-frame messages (those focusing on the negative outcomes), consistent with prior work demonstrating that gain-frame messages are more effective (15). Furthermore, based on prior work suggesting that message source (the source from whom the participant perceives the message originates) impacts behavior change among adults (16), we created messages that appear to originate from the MPOWER team rather than from the health system in general.

We incorporated strategies adopted from motivational interviewing (17) with some of the messages consisting of open-ended questions for the participants to ponder and create their own solutions rather than being given a suggested course of action in each case. Based on the Elaboration Likelihood Model, this approach should encourage participants to engage in central processing and encourage them to participate in the psychologic work that promotes behavior change (18). In addition, based on Social Determination Theory it should enhance autonomous motivation to change (19).

Message type. Six different types of messages were developed to be tested in the focus groups. These were:

- *Testimonials:* containing strategies others found helpful in weight loss efforts (e.g., "A teen says "TV was one of my favorite things, and I really didn't want to cut back. But, I dropped a few shows, and the truth is, I don't even miss them!"").
- *Meal/recipe ideas:* with healthy options and substitutions (e.g., "Got a sweet tooth? Try frozen grapes or berries in your whole-grain cereal or low-fat yogurt. The fruit is crunchy and may satisfy your cravings for sweets").
- *Targeted tips:* providing information on 1 of the 6 target behaviors (e.g., "Your goal is at least 5 veggies and fruit a day. That's about 2.5 cups. Have half a cup at breakfast, 1 cup at lunch and 1 cup at dinner.")
- *Reflective questions:* prompting consideration of self-generated ideas (e.g., "What does being healthy mean for you? How does screen time fit in with your goals? How could less screen time help your health?"). Though the domains (i.e., values or goals) addressed in these questions may also be addressed in other types of messages, reflective questions were intended to encourage psychologic work.
- *Feedback questions:* requesting patients to text a response (e.g., "Over the past week, how did your weight change? Text 1 if your weight went down, 2 if it went up, or 3 if it stayed the same"). This would be followed by an automatic text response (e.g., if the adolescent sent a text with the number "1" indicating that his/her weight went down, then they might receive the automated response "Spectacular").
- *Tailored messages:* created to be tailored, when used in the planned text messaging intervention, to participants' self-report of the six target behaviors at baseline, along with other characteristics such as values, food preferences, motivations, sources of support, and goals. For example, a participant who reports skipping breakfast might receive the message: "People who skip breakfast are more likely to snack and overeat at lunch. Eating breakfast means your energy is steadier through the day and you'll eat better." Someone who reports eating breakfast daily might receive the message: "You eat breakfast every day. That's really smart. It means you're less likely to overeat later, especially at lunch. Keep up this great habit!" In addition, a default message was created that would go to someone for whom information regarding breakfast consumption was missing. The default messages were more general, and might state "Eating breakfast every day is a great way to eat less throughout the day, and helps with weight loss." For this focus group testing, participants were informed what baseline characteristics patients would have reported in order to receive the message being tested.

Data collection. Focus groups were 90–120 min long and were each performed by three of the authors (S.J.W., C.J., and K.B.). Messages were displayed one at a time on PowerPoint slides. Each focus group reviewed ~70 unique messages. All focus groups reviewed messages from each of the six messages types listed above. Using the Quizdom audience participation system (20) participants were able to vote "Yes" (I like it as is) or "No" (let's change it to make it better). If more than 40% of participants said "let's change it," participants' perceptions were elicited in a discussion regarding ways to improve the message and whether to discard it. Those with a higher approval rating were not discussed. At the completion of the sessions a general discussion of the messages also occurred. The comments and recommendations made by the adolescents were recorded by two note takers for later review.

Data management and analysis. Detailed notes of participants' comments from the focus groups were collated and reviewed. Themes were identified by two authors; a third adjudicated differences. Changes were made to messages based on the participants' recommendations and if it were a substantial change, these messages were retested as part

of the final focus group. In addition, the identified themes from the first three focus groups were also discussed during the final focus group, to explore whether the stated themes reflected the participants' opinions. This study was approved by the institutional review board of the University of Michigan Medical School.

RESULTS

The demographics and change in BMI for the adolescents in the focus groups reflected the demographics of MPOWER participants overall. Most of the participants in the focus groups ($n = 24$), were female (71%) and 45% were Medicaid enrollees (no participants were uninsured). The participants were ethnically diverse, with more than half being nonwhite (46% white, 33% black, 21% other—including Hispanic, Native American, Arab American, and Mixed race). All participants had BMIs greater than the 95th percentile. The mean BMI was 38.9 (median BMI 36; range: 27.6–76.9). The mean age of participants was 14.3 years old (median age 15; range: 11–19 years). The average change in BMI over a 3-month period for focus group participants was -1.0 BMI units, which is similar to the change seen by MPOWER patients in general. As the focus group participants included adolescents who lost weight, gained, stayed the same, or did not remain in the program over the course of 3 months, we believe they are representative of MPOWER participants at large.

Participant feedback

Participants were uniformly enthusiastic about the idea of an intervention that would send them text messages to aid their

weight loss efforts. They enjoyed the process of evaluating the messages and had numerous suggestions for improving the messages being created.

Theme 1 message type

Participants expressed a preference for directive messages that told them specifically what to do (Table 1). In keeping with this, they were most enthusiastic about the recipes because they gave them concrete ideas to try and the testimonials because they included successful weight loss strategies used by peers. In addition, testimonials seemed to provide hope and normalize their experience but only when we indicated that the testimonials were from another teen. In the first iteration of the messages, the testimonials stated “a patient said...”. However, the adolescents were unanimous that the message would be more relevant to them if we stated that “a teen said...” or “a peer said...”. Tailored messages were also viewed positively because they were perceived by the adolescents as very personally relevant. The targeted tips had a generally positive response, with participants expressing enthusiasm about the ones that they felt they could incorporate into their routine.

Messages that called for participants to reflect on ways they might make healthy choices were not viewed favorably. In particular, if questions were posed in an effort to promote reflection and self-generated ideas, they indicated that the number of questions included in a text message should be limited. By contrast, the feedback questions that asked for a text response

Table 1 Message type

Text message	Typical quotes
<i>Recipes</i>	
Think of ways to make fruits and vegetables more interesting. Freeze your grapes. Steam your carrots w/ spices. Add peanut butter and raisins to your celery.	<i>“I like that they give us suggestions to try,”</i>
<i>Testimonials</i>	
One teen said, “Exercise was boring until I started walking at the mall with my friend. It is fun to walk and window shop!”	<i>“I like hearing someone else’s opinion because it makes me feel like I’m not the only one in this situation.”</i>
<i>Tailored messages</i>	
You said you feel embarrassed about your weight. Try not to assume others are judging you. They may feel insecure about something too. (Participants who stated on their initial questionnaire that they were embarrassed about their weight would get this message)	<i>“This reminds me no one is perfect, we all have problems.” “That will help people so they know they’re not the only ones going through stuff.”</i>
<i>Reflection questions</i>	
What interests you? Cutting back on screen time may make room for a new hobby. If it’s active, great. If not, it’s still good to get away from the screen.	<i>“Take out ‘What interests you?’ Say ‘Instead of watching TV, find a hobby.’ ‘Give examples of new hobbies, like ‘go shoot some hoops’ or ‘go play some b-ball.’”</i>
What does being healthy mean for you? How does screen time fit in with your goals? How could cutting back on it help improve your health?	<i>“Too many questions” “Whoa! That’s a lot of questions. It’s like which question do I answer first?”</i>
<i>Feedback questions</i>	
“On a scale from 0 to 10, how hard will it be for you to drink water or sugar-free drinks instead of sweetened drinks? (0= very easy, 10= very hard) “	<i>“Much better”</i>
<i>Targeted tips</i>	
Your goal is at least five veggies and fruit a day. That’s about 2.5 cups. Have half a cup at breakfast, 1 cup at lunch, and 1 cup at dinner.	<i>“That would help me stay on track.” “Cool.”</i>

Table 2 Message tone

Text message	Typical quotes
<i>Congratulations messages (for weight loss)</i>	
Good job (Participants who send a message indicating that they <i>lost weight</i> may get this automatic response)	"Boring." "Needs more." "Sounds like something my teacher would write on my homework, whoop-dee-doo."
Spectacular (Participants who send a message indicating that they <i>lost weight</i> may get this automatic response)	"All of these should have a smiley face or exclamation points after them."
Spectacular!!!:) (Revised message)	"I like it"
<i>Commiseration messages (for weight gain)</i>	
Hang in there, it sometimes takes a while to see the results of your hard work (Participants who send a message indicating that they <i>gained weight</i> may get this automatic response)	"Now these are what I am talking about."
<i>Encouragement messages (for no change in weight)</i>	
That's ok! Just because you didn't lose weight last week, you still can this week. (Participants who send a message indicating that their weight <i>stayed the same</i> may get this automatic response)	"Because you didn't lose weight... that sounds like they feel sorry for me or something? Say "At least your weight didn't go up. Keep trying."
That's great! Even though you didn't lose weight last week you didn't gain. Remember, you don't have to lose weight every week to still lose weight in general. (Participants who send a message indicating that their weight <i>stayed the same</i> may get this automatic response)	"Take out the exclamation mark after "That's great!" Put a period instead." "...makes it too congratulatory."

Table 3 Unintended consequences

Text message	Typical quotes
For a snack, swap ice cream for an apple or a cup of grapes. Healthy, filling, and adds a serving of fruit to your day. Triple win!	"I think it's ok, but more on the no side because this just makes me think of ice cream."
Coke, small fries, and a hamburger at McDonald's? 750 cal. Water and a salad? 350 cal. Health benefit? Priceless.	"If I got a text like that, I'd say "I want a Big Mac, a Coke, and a French fry!"
Watching TV for 1 h burns only 75 cal. Walking for 1 h burns 250 cal, and helps you lose weight faster. How else does it help you?	"Awesome, I'm burning calories by watching TV." "I didn't know you can burn calories watching TV." "That makes me lose my spirit to exercise."
When you're watching TV, do you like to snack? Choosing a fruit or vegetable means you get closer to your "5 A Day" goal"	"I don't snack while watching TV, but if I got this, I would think about having a snack." "It isn't a good idea to make me think about junk food while I am watching TV. I will probably go get some."

regarding a concrete question such as "Over the past week, how did your weight change? Text 1 if your weight went down, 2 if it went up, or 3 if it stayed the same" were given favorable ratings.

Theme 2 message tone

Participants liked messages that were positive and encouraging (Table 2). They indicated that as the messages came from the program providers, they should have a natural tone but should avoid using colloquial abbreviations generally used by adolescents (e.g., LOL). However, they were unanimous that symbols/emoticons (e.g., exclamation points and "smiley faces") should be used to convey enthusiasm. This was particularly important for congratulations messages sent for a decrease in weight. For encouragement messages, to be sent if weight remains unchanged, adolescents indicated that it was important to strike a balance. The messages should not sound too excited, because there was not any weight loss, but they also should not sound too sad, because weight maintenance could be a good thing. For example, we suggested "Great work! Keep it up!" for an encouragement message, however, the teens felt this was overly positive.

Theme 3 unintended consequences

Participants emphasized that the content of some messages had the potential to trigger unhealthy behaviors (Table 3). Specifically, they emphasized that mentioning unhealthy foods would most likely cause them to want those foods. This was the case even if the text also included healthier options or reasons for not eating the less healthy foods. Similarly, if the texts presented information that might be perceived as benefits of sedentary behaviors (i.e., mentioning the number of calories burnt while watching television), this would cause them to be more likely to be sedentary even if reasons for not engaging in these behaviors were presented or if more appropriate alternatives were suggested.

Revised messages

Based on the findings from the initial focus groups, messages were revised in the following ways:

- (a) Congratulation messages were enhanced with emoticons and exclamation points.
- (b) All references to possible trigger foods and behaviors were removed.

- (c) Messages were revised to limit questions to no more than two questions per text.
- (d) Messages were made more directive.
- (e) Encouragement messages were revised to sound pleased but not excited.

Participants' ratings of the messages revised due to initially receiving an approval rating of <60% revealed a marked improvement. The mean rating for all messages tested in this study was 79% (range 12–100%). The mean rating for messages that were revised and retested was 38% (range 12–50%) before being revised, and the mean was 86% (range 50–100%) after revision.

DISCUSSION

Due to the increasing popularity of text messaging among adolescents (21,22), a number of health-related initiatives have considered using this strategy to improve health, including weight reduction (11,12,23). However, this is the first study to our knowledge to explore adolescents' perceptions of the content of text messages for use as an adjunct to a pediatric multidisciplinary weight management program. Our results suggest that it is important to carefully construct the content of text messages for such interventions.

Most importantly we found that it may be possible to cause iatrogenic harm by including messages that could trigger consumption of unhealthy foods or engagement in unhealthy behaviors. In this study, participants reported what they believed would happen if they received these messages; further research is required to determine whether messages would actually have this impact in real world testing. However, this finding highlights the need to pretest messages and to rigorously evaluate whether text messages actually achieve their intended purpose.

Another noteworthy and somewhat surprising finding from this study is that the adolescents' expressed a strong preference for directive messages. They stated repeatedly that they just wanted to be told what to do, rather than having to think about ways in which they might address weight loss challenges. It appears that they wished to avoid the psychologic work the messages tried to promote. Complying with this desire would go counter to the recommendations of other behavior change literature which suggests that self-generated ideas about behavior change are more likely to result in sustained behavior change than changes made as a result of instructions from providers (18). Specifically it seems inconsistent with autonomous motivation, unless such messages stress teens' volition in making changes. The impact of self-generated ideas is one reason for the popularity of motivational interviewing as an effective means of promoting behavior change. It may be that a motivational interviewing approach is not conducive to the 160 character limit allowed in an SMS text message. Or consideration might be given to taking a middle road and providing messages that are more directive (which would limit the psychologic work) but which still convey autonomous motivation by ensuring that the messages do not appear to be coercive (24).

These findings highlight the need for further study to explore the impact of messages with different degrees of direction and prompting different amounts of psychologic work, on behavior change among obese adolescents.

We tested six types of text messages, all of which were liked by participants, with the exception of reflective questions. Recipes and testimonials emerged as favorites. This appeared to be because recipes provided direct ideas of options participants' might try. For testimonials, they seemed to offer participants' a sense of comfort from knowing that others struggled with the same issues they face and that they found successful approaches to achieving weight loss.

Almost all participants expressed a strong desire for messages that were positive and enthusiastic. The use of emoticons was encouraged as a means of bringing the messages to life and showing excitement when congratulating participants on meeting goals or losing weight. However, texting slang (such as LOL) was not considered appropriate and appeared to be viewed as too informal as the message source was the weight management team. The participants' specific feedback about the message tone and terminology underscores the need for formative work with the target population when developing text messaging interventions.

Limitations

This study was a small qualitative study utilizing focus groups which allowed us to explore adolescents' perceptions of the content of text messages. By using focus groups, we faced the possibility of our findings being influenced by contagion effects, with the group going along with the views of the most vocal participants. We attempted to mitigate this effect by using an audience participation system, which allowed participants to register their opinion about the messages individually, before knowing the opinions of others in the group.

In this study, we did not explore adolescents' perceptions of actually receiving the messages on their mobile phones during the course of their daily activities, or the impact that receiving such messages might have on their BMI. These questions, along with questions of message frequency, timing, and the use of graphics in messages, will be addressed in future phases of this project.

Implications and next steps

This study confirms our previous work suggesting that adolescents have positive views of text messages that support a weight management program. It highlights the importance of carefully constructing and pretesting text messages to be used in health interventions for adolescents, in order to avoid unintended effects. Furthermore, it indicates the need for additional studies to explore the differential effects of directive texts messages, versus those requiring more psychologic work, on behavior change among adolescents. Further work is also required to evaluate the effect of tailored text message interventions on weight loss, adherence, and program retention, along with the possibility of utilizing text messages in the treatment of other chronic conditions.

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DISCLOSURE

The authors declared no conflict of interest.

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