Published in final edited form as:

Clin Pediatr (Phila). 2012 July ; 51(7): 678–684. doi:10.1177/0009922812440839.

Eat, Play, Love Adolescent and Parent Perceptions of the Components of a Multidisciplinary Weight Management Program

Susan J. Woolford, MD, MPH,
University of Michigan, Ann Arbor, MI

Bethany J. Sallinen, PhD,
University of Michigan, Ann Arbor, MI

Sarah Schaffer, MA, and
University of Michigan, Ann Arbor, MI

Sarah J. Clark, MPH
University of Michigan, Ann Arbor, MI

Abstract

Background—Participants' perceptions may be associated with the high attrition rates reported by weight management programs.

Objective—To explore participants' perceptions of a weight management program.

Methods—Semistructured interviews were performed (spring 2010) with past participants of the Michigan Pediatric Outpatient Weight Evaluation and Reduction program. Transcripts were reviewed and themes identified.

Results—Parents (38) and adolescents (25) were interviewed separately; similar themes emerged. Theme 1: Support/encouragement—Participants emphasized the importance of a supportive environment with a positive, compassionate approach from providers. Theme 2: Exercise—Fun, achievable activities were a valued means of making exercise enjoyable and building self-efficacy. Theme 3: Nutrition—Hands on demonstrations and tangible suggestions were preferred over activities such as self-monitoring. Theme 4: Behavioral factors—Participants valued the opportunity to hear their peers' experiences. However, individual/family sessions addressing their personal concerns were also viewed as important.

Conclusion—Beyond program content, participants valued a supportive environment emphasizing health over habitus.

Introduction

In response to the epidemic of childhood obesity, a number of children's hospitals and academic centers across the United States have developed multidisciplinary weight management programs for adolescents.¹⁻³ Indeed, the 2007 Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity suggest referral to a multidisciplinary program for obese adolescents who have not experienced the degree of weight loss desired through primary care interventions.⁴ Although few such programs have published data, the evidence suggests that treatment outcomes are modest and attrition rates are high.⁵⁻⁷ Because of the numerous health and financial consequences of childhood obesity, it is vital to determine the reasons for these findings and to explore ways to improve outcomes.⁸⁻²⁶

Although a number of participant-related factors such as time constraints and financial considerations likely play a role in rates of attrition,⁷ it is probable that participants' (both

parents' and patients') perceptions of program components will influence whether they remain in treatment or whether they drop out prematurely. Most multidisciplinary weight management programs for adolescents at academic centers include nutrition, physical activity, and behavioral components.³ The frequency of visits, format of sessions (group vs individual), and the specific curriculum vary and are generally affected by consideration of resources (e.g., provider availability and space), provider preferences, and the theoretical foundation of the program.³

We therefore wished to explore participants' opinions of a family-focused multidisciplinary weight management program for adolescents with the goal of identifying the factors thought by participants to be the most enjoyable and the most helpful, along with their suggestions for ways to improve aspects they did not value. In addition, we wished to determine whether perceptions differed between adolescents and their parents.

Methods

Study Design

In this qualitative study, semistructured interviews were performed with parents and adolescents who participated in the Michigan Pediatric Outpatient Weight Evaluation and Reduction (MPOWER) program.⁵ These phone interviews were performed with adolescents and parents separately between December 2009 and March 2010, and they explored satisfaction with the program's various components and requested feedback regarding a number of other program features.

Sample and Recruitment

Adolescents and their parents who participated in the MPOWER program were eligible for this study. To participate in the MPOWER program, adolescents had to have a body mass index at or above the 95th percentile for age and sex and be 12 to 18 years old at program enrollment.

Recruitment

Using an internal database listing 130 past and present participants of the MPOWER program, we called all parents to request an interview. After requesting an interview with the parent, we asked to interview their adolescent. If the parent and/or adolescent were willing to participate in an interview, but were unable to complete it at the time of the initial phone call, the interview was scheduled for a subsequent time. Up to 3 attempts were made to contact parents in an effort to recruit them for this study.

Program Overview

The study was designed to explore participants' perceptions of the MPOWER program components. The MPOWER program is a 6-month, intensive, multidisciplinary weight management program for adolescents 12 to 18 years old that was developed and implemented at the University of Michigan.⁵ This family-focused program, based on self-determination theory and incorporating components of evidenced-based interventions,²⁷⁻²⁹ provides a carefully planned sequence of weekly sessions, including the following components:

Nutrition: 1-hour group classes (adolescents and parents together) every other week addressing topics such as fiber, eating out, portion control, meal planning, snacks, and self-monitoring.

Exercise: Weekly 1-hour classes (adolescents only) with aerobic exercises, resistance training, and team games; concluding with a weekly weigh-in.

Behavioral component: Monthly 1-hour group classes (parents and adolescents separately) and monthly 1-hour individual/family sessions, both addressing topics such as food triggers, self-esteem, goal setting, and motivation. To increase adherence to treatment plans, motivational interviewing is used as the platform to deliver behavior modification techniques.

Survey Instrument

Separate interview guides were developed for parents and adolescents. The guides included both open-ended questions (e.g., “What, if anything, was the most helpful part of the program?”) and closed-ended questions (e.g., “Were weekly weight checks helpful?”). Questions for both parents and adolescents probed perceptions of the program's exercise, nutrition, and behavioral components and requested suggestions for improving the program. Interviewees were also asked to provide feedback regarding several specific program features, including weigh-ins, food logging, and home visits.

Data Collection

Interviews were performed by a masters-level researcher not associated with the MPOWER program. To decrease the likelihood of eliciting only positive responses, participants were informed of this on recruitment and at the beginning of their interview. All interviews were recorded and detailed notes were taken. Interviews lasted from 20 to 60 minutes for parents and from 15 to 20 minutes for adolescents. A total of 63 interviews were completed, including 38 parents and 25 adolescents. A total of 22 parent-adolescent pairs were interviewed.

Data Analysis

The detailed interview notes were reviewed. Themes were identified by 2 authors using the constant comparative method; a third adjudicated differences. Themes identified in earlier interviews were specifically probed with subsequent participants. This study was approved by the institutional review board of the University of Michigan Medical School.

Results

All but 1 of the parents/guardians interviewed were female (35 mothers and 3 grandmothers). The majority of adolescents were also female (84%). This reflects the MPOWER patient population, which is also mainly female (70%). The mean age of adolescents was 16 years (range was 14-20 years). As expected, because the study recruited past program participants, this is older than the average age of participants at program entry (14 years old). The adolescents reflected the typical racial diversity of MPOWER patients (white 64%, black 28%, other 8%). The majority of parents interviewed (62%) had children who had completed the MPOWER program, and the majority of children interviewed (68%) completed the MPOWER program. Of note, previous reports of MPOWER outcomes indicated a completion rate of 72%.⁵ In general, the responses provided by adolescents and their parents were similar, and the following themes emerged regarding the major program components.

Nutrition

The nutrition-related comments from parents and adolescents addressed 5 main categories:

1. *Nutrition Education:* Such as appropriate portions or the fiber content in different foods.

2. *Tips and Tools*: Tips included guidelines such as selecting cereal with 3 grams or more of fiber, or mnemonics to help guide food choices, and tools included providing items such as portion plates or water bottles.
3. *Recipe/Ingredient Ideas*: Particularly, recipe makeover activities, where participants' favorite recipes were revised to decrease the fat, sugar, and calorie content.
4. *Self-monitoring and Planning*: Focusing on keeping food logs or planning meals.
5. *Hands-on Activities/Visual Aids*: Such as fat and sugar tubes, illustrating the amount of these components in popular foods and beverages.

In general, the least popular activities were self-monitoring tasks (e.g., food logs) and planning activities (e.g., making grocery lists and planning meals). In contrast, participants valued hands-on demonstrations most, along with the tangible suggestions provided via recipe ideas, tips, and tools. Typical quotes included the following:

We were given such practical tools to remember. Like the big water bottles—2 before two and 2 after two. (Parent)

The dietitian had some very concrete examples of, I mean she literally had plates that she distributed with recommended serving sizes on them. So you really had a literal visual on this plate that could actually be used as a serving plate. It was really helpful—it's all the visual cues that they had. (Parent)

I remember one particular one was cool where [the dietitian] brought in different foods, different foods that people commonly eat, and then showed how much, like she had a stack of rubbery stuff and it represented the fat that was in like the cheeseburger or something. So I thought that was interesting because it was in your face, showing you what's in the foods. (Adolescent)

Though parents' and adolescents' preferences regarding the content of the nutrition sessions were similar, adolescents in particular appeared to have a lower baseline knowledge of nutrition and indicated that receiving this information was helpful.

Exercise

The exercise component of the program was the most popular among adolescents. They emphasized that the exercise sessions were valuable because they provided an intense workout, and because they were fun. They seemed to suggest it was fun and enjoyable because there were a variety of activities (including resistance training, which was very popular), the activities were things they could accomplish, and because team members performed the exercise with them. Interestingly, parents were also very enthusiastic about the exercise component, though they did not participate in the exercise sessions and could only provide feedback based on their observation of their adolescents. Parents emphasized that unlike other exercise experiences, MPOWER exercise sessions seemed to increase their adolescents' confidence. Typical quotes included the following:

She was fun about it. She [the exercise physiologist] made sure we got a really good work out, but yet she would try to incorporate, you know, little fun activities, and she made it more than just going in to work out and sweat. She made it into more fun so that we would be interested in doing it. (Adolescent)

I wasn't sure at first. I was kind of like are they just gonna have us, I don't know, run all the time and just lecture to us? But—and like the instructor just tell us what to do—but our instructor did pushups with us and she was really nice. (Adolescent)

As far as like the exercise program and that, she really enjoyed it . . . they were super, super nice to her, and she never felt like she couldn't do something. When she started, she had a harder time, and then by the time that she got further along, she was more confident in herself and I've seen a total change in her personality and everything. I think it really gave her a boost of confidence. (Parent)

When prompted to discuss ways in which the exercise component could be enhanced, the most commonly mentioned problem was the distance that patients had to travel to attend sessions and the desire to have classes offered closer to their homes.

Behavioral Component

The MPOWER behavioral content was delivered in 2 main settings. Every month, patients participated in a group behavioral session focused on topics such as eating triggers or self-esteem (with parents and adolescents in separate groups), and patients also had a 1-hour individual/family behavioral session. We attempted to determine which setting was considered least valuable by participants but were unable to make this distinction. Both individual and group sessions appeared to offer unique benefits and seemed to be of equal importance to participants. The individual sessions were appreciated because they provided the opportunity to focus on personal concerns, whereas group sessions were considered beneficial because they allowed adolescents and their parents to hear that their peers had similar struggles and to find a solution together. Typical quotes included the following:

I liked being able to talk in a group with the other people who were my age. . . Just how it wasn't just me who was struggling with losing weight at the time, it was more a bunch of other people and trying to find ways to come up with how to lose it and keep motivated. (Adolescent)

I think the biggest thing was, you know, you think that your kid is like the only one doing certain things, and so it's kind of comforting to know that, maybe this is really normal because other parents had that. Or just the sharing because sometimes you don't think about things, and then when another parent says something, you're like, oh right. So I like the discussions. (Parent)

I like when we came in and we had the one-on-ones with the doctor, the nutritionist . . . because they answered a lot of questions that I was really concerned about. (Parent)

Of note, adolescents and parents indicated the importance of focusing on why they make certain choices and the benefit of gaining this type of insight, which occurred in both the group and individual settings. When prompted to discuss ways in which the behavioral component of the program could be enhanced, the most common suggestion from parents was to incorporate more individual sessions. The suggestions from adolescents included incorporating peer presentations from previous participants who have successfully experienced weight loss and maintained it and having more adolescent-only groups for patients to share their thoughts and feelings.

Intangible Support

An unexpected finding from the interviews was parents' and adolescents' emphasis on the significance of intangible features of program participation. In particular, they highlighted the emotional support from providers and other participants, and the nonjudgmental program tone focused on health rather than weight loss. These themes emerged from spontaneous participant comments and were not elicited by prompts in the interview guide. Typical quotes included the following:

Everyone was very encouraging. I felt like there wasn't anything I couldn't talk about. (Adolescent)

I loved how like you felt that . . . there were other people supporting you. (Adolescent) They were very supportive, and encouraging. (Parent)

[I liked the message] . . . that being healthy is the most important part of all of it, that the weight loss is really secondary. (Parent)

All of us like we united because we had some of the same problems and I really liked having, you know, the same problems in common with people that were totally different from me. (Adolescent)

Additional Program Components Evaluated

Home visits

Home visits from the MPOWER team members were offered to all program participants. However, many parents indicated that they were hesitant to accept a visit as they did not know exactly what to expect and worried about judgments that might be made about their homes. Only one third of the participants interviewed accepted a home visit, but all indicated that it was a very positive experience. They suggested that the visits were a good way to reach additional family members who did not regularly attend clinic sessions. Specifically, parents liked the way in which in-home instruction helped them apply the lessons they learned to their own environment.

We actually, we really liked the home visit, which wasn't just nutrition. You know, with several members of the team, but we'd never had anyone do that before and just, you know, just the practicality of it was wonderful. We begged them to stay and live with us! (Parent)

Well we took a walk and we talked about what I eat at home, and how I like portion myself at home, how I exercise at home, so that was helpful. (Adolescent)

Yeah . . . I liked that they were actually showing that they cared about what we were eating at home and stuff. (Adolescent)

Weekly weight checks

Adolescents' weights were measured and recorded on a weekly basis during MPOWER sessions. All the parents and adolescents interviewed thought that regular weekly weight checks were appropriate. Many felt the weight checks kept them accountable, motivated them, and helped them monitor their progress. A few adolescents indicated that they did not like the weight checks at first but grew to appreciate their importance.

I really liked it 'cause it kinda kept me accountable, and like for me to know I was going to be weighing in and so I kind of see. And if I had a gain, you know, I could think what I could improve on in the time in between. (Adolescent)

When discussing the weekly weight checks, adolescents and parents noted the importance of a nonjudgmental approach to the process.

Even if there were times she didn't lose weight or she gained weight, she was never demeaning or accusatory. It was always, always very positive about helping her move forward. (Parent)

Discussion

This novel study explored parents' and adolescents' perspectives of pediatric multidisciplinary weight management. We found that parents and adolescents generally expressed very similar views, apart from a few expected age-related differences. For example, adolescents expressed a greater desire for basic nutrition information than their parents. This is likely because of a lower level of knowledge about healthy lifestyle practices owing to their young age and limited experience. Also, parents and adolescents differed regarding the components that were of concern to them—specifically, parents were reticent about home visits and adolescents were initially worried about weekly weight checks. However, in both cases participants noted that despite their initial concerns they found these features particularly helpful. This underscores the fact that obesity treatment includes potentially sensitive procedures, and efforts should be extended to make these valuable features as acceptable to participants as possible.

Our findings suggest that participants valued tangible nutrition recommendations that could be readily adopted, interactive demonstrations and visual activities, and tips/tool that helped them easily incorporate healthy practices into their routine. However, it is uncertain whether these features promote weight loss. Conversely, activities that are known to be associated with successful behavior change and weight loss such as self-monitoring were not as popular with participants.³⁰ This is probably because such tasks require a significant amount of time and commitment. To promote engagement and decrease attrition while improving outcomes, it is likely that programs will need to strike a balance between preferred activities and evidence-based tasks.

Obese adolescents are sometimes characterized as being adverse to physical activity,³¹ but our findings suggest that this might not be the complete picture. Parents indicated that in many settings requiring sports participation, their children suffered negative experiences. However, during program exercise sessions, they were able to keep up with their peers and master the activities, making it a positive experience. The adolescents agreed, selecting exercise as their favorite program component and emphasizing the supportive atmosphere, the variety of activities, to most importantly, the fact that it was fun. This suggests that in the right setting, obese adolescents could embrace the opportunity to be active.

Beyond the typical components of a pediatric multidisciplinary weight management program, obese adolescents and their parents viewed a supportive, nonjudgmental environment that emphasized health as being particularly valuable. The importance of support from team members permeated the exploration of all aspects of the program, and peer support was particularly evident in the discussion of behavioral sessions where parents and adolescents met in separate groups. Multiple studies suggest that obese adolescents face peer victimization, are frequently socially ostracized, and report a lower quality of life than their normal weight peers.^{32,33} In light of these experiences, participants may have been particularly receptive to a setting where they felt accepted and not judged based on their size.

In a society that is preoccupied with appearance, obese adolescents might be inclined to expect that a weight management program has a similar focus. Finding an emphasis on the importance of health over habitus may have been unanticipated. This outlook could be an important means of making program participation more palatable, and it has scientific support as improved fitness even without weight loss has been shown to have health benefits.³⁴ This perspective may be a distinction between commercial weight loss programs and those housed within the medical community. Though an emphasis on overall health and social support may not be considered the primary purpose of a weight management program,

focusing on these aspects of care may promote program participation and ultimately improve weight, health, and quality of life outcomes.

Limitations

This study was performed in 1 pediatric multidisciplinary weight management program among a relatively small number of patients, and findings may differ for other programs and in larger populations. In addition, not all past program participants were interviewed, and the response rate was low. Those interviewed may have differed from MPOWER participants overall. However, the participants interviewed included those who lost weight, gained weight, completed the program, and those who dropped out early. Therefore, it is likely that the findings reflect the spectrum of perspectives of program participants. In addition, a greater proportion of those interviewed dropped out of the program than is typical for program participants, so it is unlikely that we got particularly positive responses from a population that had more favorable opinions about the program than the program participants at large.

Conclusions

This study may have useful implications for the enhancement of weight management programs for adolescents. In addition to the traditional components of a multidisciplinary intervention such as providing opportunities to exercise, nutrition information, and behavioral strategies, factors that are of particular importance to participants may be relevant to engagement. Participants emphasized 3 valued elements: (a) nutrition guidance that is tangible, visual, and easily adopted; (b) physical activities that are enjoyable; and (c) an environment that promotes support from peers and providers. Further study should explore whether emphasis on these aspects of treatment improves program retention and weight loss.

References

1. Ogden CL, Carroll MD, Curtin LR, Lamb MM, Flegal KH. Prevalence of high body mass index in US children and adolescents, 2007-2008. *JAMA*. 2010; 303:242-249. [PubMed: 20071470]
2. Strauss RS, Pollack HA. Epidemic increase in childhood overweight, 1986-1998. *JAMA*. 2001; 286:2845-2848. [PubMed: 11735760]
3. Eneli, I.; Patel, D.; Cunningham, A.; Hinton, T.; Stephens, J.; Murray, R. Pediatric obesity programs in US children's hospitals.. Paper presented at: Pediatric Academic Societies' annual meeting; Honolulu, HI. May 3-6, 2008;
4. Barlow SE. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. *Pediatrics*. 2007; 120(suppl 4):S164-S192. [PubMed: 18055651]
5. Woolford SJ, Sallinen BJ, Clark SJ, Freed GL. Results from a clinical multidisciplinary weight management program. *Clin Pediatr*. 2011; 50:187-191.
6. Savoye M, Shaw M, Dziura J, et al. Effects of a weight management program on body composition and metabolic parameters in overweight children: a randomized controlled trial. *JAMA*. 2007; 297:2697-2704. [PubMed: 17595270]
7. Zeller M, Kirk S, Claytor R, et al. Predictors of attrition from a pediatric weight management program. *J Pediatr*. 2004; 144:466-470. [PubMed: 15069394]
8. Dietz WH. Health consequences of obesity in youth: childhood predictors of adult disease. *Pediatrics*. 1998; 101(3 pt 2):518-525. [PubMed: 12224658]
9. Woolford SJ, Gebremariam A, Clark SJ, Davis MM. Persistent gap of incremental charges for obesity as a secondary diagnosis in common pediatric hospitalizations. *J Hosp Med*. 2009; 4:149-156. [PubMed: 19301381]
10. Woolford SJ, Gebremariam A, Clark SJ, Davis MM. Incremental hospital charges associated with obesity as a secondary diagnosis in children. *Obesity*. 2007; 15:1895-1901. [PubMed: 17636109]

11. Ciba I, Widhalm K. The association between non-alcoholic fatty liver disease and insulin resistance in 20 obese children and adolescents. *Acta Paediatr.* 2007; 96:109–112. [PubMed: 17187615]
12. Franks S. Polycystic ovary syndrome. *N Eng J Med.* 1995; 333:853–861.
13. Manoff EM, Banffy MB, Winell JJ. Relationship between body mass index and slipped capital femoral epiphysis. *J Pediatr Orthop.* 2005; 25:744–746. [PubMed: 16294129]
14. Rhodes SK, Shimoda KC, Waid LR, et al. Neurocognitive deficits in morbidly obese children with obstructive sleep apnea. *J Pediatr.* 1995; 127:741–744. [PubMed: 7472827]
15. Steinberger J, Moorehead C, Katch V, Rocchini AP. Relationship between insulin resistance and abnormal lipid profile in obese adolescents. *J Pediatr.* 1995; 126(5 pt 1):690–695. [PubMed: 7751990]
16. Caprio S, Hyman LD, McCarthy S, Lange R, Bronson M, Tamborlane WV. Fat distribution and cardiovascular risk factors in obese adolescent girls: importance of the intraabdominal fat depot. *Am J Clin Nutr.* 1996; 64:12–17. [PubMed: 8669407]
17. Must A, Strauss RS. Risks and consequences of childhood and adolescent obesity. *Int J Obes Relat Metab Disord.* 1999; 23(suppl 2):S2–S11. [PubMed: 10340798]
18. Schwimmer JB, Burwinkle TM, Varni JW. Health-related quality of life of severely obese children and adolescents. *JAMA.* 2003; 289:1813–1819. [PubMed: 12684360]
19. Strauss RS, Pollack HA. Social marginalization of overweight children. *Arch Pediatr Adolesc Med.* 2003; 157:746–752. [PubMed: 12912779]
20. Guo SS, Roche AF, Chumlea WC, Gardner JD, Siervogel RM. The predictive value of childhood body mass index values for overweight at age 35 y. *Am J Clin Nutr.* 1994; 59:810–819. [PubMed: 8147324]
21. Srinivasan SR, Bao W, Wattigney WA, Berenson GS. Adolescent overweight is associated with adult overweight and related multiple cardiovascular risk factors: the Bogalusa Heart Study. *Metabolism.* 1996; 45:235–240. [PubMed: 8596496]
22. Must A, Jacques PF, Dallal GE, Bajema CJ, Dietz WH. Long-term morbidity and mortality of overweight adolescents: a follow-up of the Harvard Growth Study of 1922 to 1935. *N Eng J Med.* 1992; 327:1350–1355.
23. Gunnell DJ, Frankel SJ, Nanchahal K, Peters TJ, Davey Smith G. Childhood obesity and adult cardiovascular mortality: a 57-y follow-up study based on the Boyd Orr cohort. *Am J Clin Nutr.* 1998; 67:1111–1118. [PubMed: 9625081]
24. Hampl SE, Carroll CA, Simon SD, Sharma V. Resource utilization and expenditures for overweight and obese children. *Arch Pediatr Adolesc Med.* 2007; 161:11–14. [PubMed: 17199061]
25. Serdula MK, Ivery D, Coates RJ, Freedman DS, Williamson DF, Byers T. Do obese children become obese adults? A review of the literature. *Prev Med.* 1993; 22:167–177. [PubMed: 8483856]
26. Finkelstein EA, Fiebelkorn IC, Wang G. State-level estimates of annual medical expenditures attributable to obesity. *Obes Res.* 2004; 12:18–24. [PubMed: 14742838]
27. Sothorn MS, Schumacher H, von Almen TK, Carlisle LK, Udall JN. Committed to kids: an integrated, 4-level team approach to weight management in adolescents. *J Am Diet Assoc.* 2002; 102(3 suppl):S81–S85. [PubMed: 11905462]
28. Brownell KD. Diet, exercise and behavioural intervention: the nonpharmacological approach. *Eur J Clin Invest.* 1998; 28(suppl 2):19–21. [PubMed: 9777323]
29. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol.* 2000; 55:68–78. [PubMed: 11392867]
30. Burke LE, Wang J, Sevick MA. Self-monitoring in weight loss: a systematic review of the literature. *J Am Diet Assoc.* 2011; 111:92–102. [PubMed: 21185970]
31. Rees R, Oliver K, Woodman J, Thomas J. The views of young children in the UK about obesity, body size, shape and weight: a systematic review. *BMC Public Health.* 2011; 11:188. [PubMed: 21439062]
32. Strauss RS, Pollack HA. Social marginalization of overweight children. *Arch Pediatr Adolesc Med.* 2003; 157:746–752. [PubMed: 12912779]

33. Janicke DM, Marciel KK, Ingerski LM, et al. Impact of psychosocial factors on quality of life in overweight youth. *Obesity*. 2007; 15:1799–1807. [PubMed: 17636099]
34. Parrett AL, Valentine RJ, Arngrímsson SA, Castelli DM, Evans EM. Adiposity and aerobic fitness are associated with metabolic disease risk in children. *Appl Physiol Nutr Metab*. 2011; 36:72–79. [PubMed: 21326380]