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Cultural perceptions of healthy weight in rural Appalachian youth

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ABSTRACT

Introduction: Rates of overweight among US children have been rising over the past three decades. Changes in lifestyle behaviors, including dietary and physical activity habits, have been examined thoroughly to identify correlates of weight status in children. Youth in rural US Appalachia are at a disproportionately greater risk for obesity and related health complications. Inadequate physical activity and poor dietary habits are two primary causes of obesity that have been noted in West Virginia adolescents. Few existing data describes the decisional balance in performing lifestyle behaviors, nor the perceptions of these youth regarding their beliefs about weight. The purpose of this study was to identify the perceptions of a healthy weight in rural Appalachian adolescents.

Methods: Ninth grade students were recruited from classroom presentations in four high schools throughout West Virginia. Interested parent-caregiver pairs returned forms to indicate interest in participation. Separate focus group interviews were conducted concurrently with adolescent and parents or caregivers to identify the cultural perceptions of a healthy weight. Questions were developed using grounded theory to explore how a healthy weight was defined, what factors dictate body weight, the perceived severity of the obesity issue, and the social or health ramifications of the condition. Verbatim transcripts were analyzed to identify dominant themes, and content analysis provided text segments to describe the themes. This article describes the data obtained from the adolescent focus groups.

Results: When asked what defined a healthy weight, the adolescents who participated in the focus groups placed great value on physical appearance and social acceptability. Students believed there was a particular number, either an absolute weight or body mass index value that determined a healthy weight. These numbers were usually conveyed by a physician; however, there was also a general acceptance of being 'thick' or a reliance on 'feeling healthy' as a determinant of maintaining a healthy weight. Despite these beliefs, many teens had unrealistic and unhealthy perceptions of weight. Female participants were more concerned with weight than males, some to the point of obsession. Both males and females expressed a social stigma associated with overweight. Issues of guilt and diminished self-esteem were prevalent. When asked about the extensiveness of the problem of childhood overweight, the students indicated that a degree of familiarity with being overweight has developed and 'you just get used to [seeing] it.' Because of the rising rates of chronic disease in this region, a fear was evident in these youth about the increased risk of developing these conditions in those who are overweight. Experiences with family members with diabetes and cardiovascular disease fueled these concerns, which instilled a fear of becoming overweight in many of the students. Many perceptions of healthy weight and appropriate body size were shaped by the media and entertainment industry. Additionally, some participants admitted to performing unsafe practices to reduce body mass, such as very low calorie diets or fasting.

Conclusions: Youth in rural Appalachia present similar perceptions about weight as other children; however, differences in perceived healthy lifestyle habits and a general acceptance of a higher average body weight present additional challenges to addressing the increasing problem of child overweight. Despite the relative isolation of many of these communities, the media has a profound impact on weight valuation that has been intertwined with school-based health education and cultural values of health. These data will provide valuable information for the development of obesity prevention programs in rural Appalachia.

Key words: adolescent, Appalachia, focus groups, health, obesity, perceptions, qualitative, weight, youth.

Introduction

The rates of at risk for overweight and overweight among US children and adolescents have doubled in the past two decades[1]. Data from the 2003-2004 National Health and Nutrition Examination Survey (NHANES) indicated that 19.9% of children (6-11 years) and 18.3% of adolescents (12-18 years) were overweight (>95th BMI-for-age percentile)[2], which represent significant increases from NHANES III (1988-1994) estimates, where approximately 11% of children and adolescents were overweight[1]. Furthermore, the rates of children and adolescents who are at risk for overweight (85-< 95th BMI-for-age percentile) are 16.6% of children and 18.5% of adolescents. Rates of overweight and obesity are greater in rural areas[3-6]. Women from rural areas are two-thirds more likely to be overweight than those from metropolitan areas[3]. Youth in West Virginia (20.9%) had the second highest rate of obesity in the US (14.8%)[4], which has resulted in an increased risk for numerous obesity-related chronic diseases, including diabetes, cardiovascular disease and cancer[7-10]. These rates are a public health concern because many problems are associated with childhood overweight, such as this having an impact on mental health and wellbeing[11], increased risk for obesity in adulthood[12-14] and increased likelihood of developing various chronic diseases later in life[15].

Despite this rise in overweight, there is little research that has examined adolescents' perceptions of a healthy weight. Nearly all of the literature surrounding weight perceptions investigated the accuracy of subjects' assessments of their own weights. In several instances, perceptions were compared to reality through BMI weight measurement classifications, where adolescents and adults regularly underestimated their weight status. A study of adolescents in London, UK found that many overweight teenagers, especially males, did not regularly recognize that they were 'too heavy'[16]. Only half of overweight boys and one-sixth of those at risk for overweight accurately assessed their weight

status. Furthermore, approximately 25% of US adolescents classified as at risk for overweight or overweight perceived themselves to be underweight[17]. Additionally, these perceptions of individual weight have been compared with actual weight. Data are lacking that specifically assess the definition of overweight, especially within a cultural context.

West Virginia is the only state entirely situated in the Appalachian region[18] and its residents experience poverty at a rate higher than the national average[19]. Adults in the state have expressed a perception of a lack of medical knowledge among their peers as well as concerns of an obesity epidemic[20]. This crisis was attributed to excessive consumption practices and lack of exercise. Another study of rural adults revealed that they were more overweight and less likely to exercise than their urban counterparts[21]; however, such data are lacking for children and adolescents.

Few studies have examined the phenomenon of overweight and perceptions of a healthy weight in rural, Appalachian children and adolescents, where overall rates of obesity have been consistently high and continue to grow[22,23]. In West Virginia, a statewide survey reported a high proportion of overweight teens (19%), with more overweight males (25%) than females (15%), and an additional 16% were classified as at-risk for overweight[24]. Considering the high rate of overweight in WV children, the purpose of this study was to ascertain the cultural perceptions of weight among rural, Appalachian adolescents. These data provided a first step toward a foundation of knowledge necessary to develop obesity prevention and treatment interventions for rural, Appalachian youth.

Methods

Participants

To investigate the cultural perceptions of a healthy diet and healthy weight among rural Appalachians, focus group interviews were conducted in four geographically diverse, rural West Virginia schools over a four-month period. All students enrolled in ninth grade health and physical education classes and their primary caregivers were recruited to participate in separate, but simultaneous, group interviews. Students were paid $20 for participating in the study.

On predetermined dates, one of the researchers visited the health or physical education classrooms to introduce the study and answer questions from the students about participation. Additionally, students were provided with a letter describing the research, and a participation form to share with their parent or caregiver. Although focus groups were conducted with the parents and adolescents, only data related to the adolescent focus groups and perceptions of healthy weight will be addressed here. The research protocol was approved by the Institutional Review Boards of The Ohio State University and Marshall University.

Focus group procedures

Grounded theory and recommendations by Kruger and Casey[25] guided development of the questioning route (Fig1). Several questions were directed toward weight-related issues, as students were asked to describe a healthy weight and discuss their assessment of the magnitude of the overweight problem among their peers and to identify fears associated with the problem.

Interested students and caregiver pairs returned the signed participation interest forms to the schools by a specified date. Once received, letters were mailed to their home addresses to confirm their invitation to focus groups. The mailings contained specific information on the research project, the schedule for focus group interviews, and the informed consent and child assent materials. Dates and times for focus groups were arranged through key informants and administrators from each school, taking into consideration school events and activities. Two to three days prior to the group interviews, telephone reminders were provided for each participant.

1. Please tell us your name and your very favorite food.
   (Food is important to all of us and impacts our life daily. Today we want to find out what you think about healthy eating and weight.)
2. What is the first thing you think about when you hear the words 'healthy diet'?
3. What does 'healthy weight' mean to you?
   (Probes: Do you think of a number, size, or body shape? If so, what is it?)
4. Do you think that most kids in your school eat healthy?
   (Probes: Why or why not? Is healthy eating a consideration?)
5. Do you think overweight and fear of overweight are problems among teenagers in your school?
   (Probes: Why is/isn't it a problem? What kind of fears do they have?)
6. Share with me what you believe is a 'healthy diet'.
7. Do things get in the way of eating healthy in teenagers your age? If so, can you list and describe some of those things for me?
   (Probe: Why or why not? Examples of barriers may include eating out, not available in cafeteria, parents purchase foods, media promotes 'unhealthy' food choices etc.)
8. What would make it easier for kids your age to eat a healthy diet?
9. Describe to me what you believe is a 'healthy weight'.
10. What have you learned about healthy eating and weight in school, from your parents, and from your friends?
11. Is there anything else that you would like to tell us about healthy eating or weight that you weren't able to share earlier?

Figure 1: Questioning route used during adolescent focus groups.

Classrooms and libraries were used for the group discussions in order to provide a familiar environment for students. Desks or chairs were arranged in a circle to facilitate discussion. Food and beverages were served prior to the focus groups and acted as a means to familiarize participants with moderators and other group members, thus increasing comfort. Time was allotted prior to the focus groups to explain the research and answer questions; consent and assent forms were signed and collected, and a brief demographic survey was completed by participants prior to initiating the focus group interviews.

A registered dietitian with previous experience in conducting focus groups moderated all adolescent groups, which consisted of both male and female participants. An assistant moderator aided in data collection, and all interviews were audiotaped to reduce the risk of recorder bias. Participants were made aware of the presence of the assistant and audiorecording devices prior to beginning the interviews.

Data management and analysis procedures

Audiotapes were transcribed verbatim by a transcriptionist. The transcribed word processor files were imported into Ethnograph v 5.04 (Qualis Research Associates; Denver, CO, USA) for coding and analysis.

Grounded theory guided the analysis of the transcript data[26]. Open coding was utilized to develop parent or primary codes that were assigned to dominant themes. Because two researchers reviewed the transcripts, agreement on the code book was achieved at the beginning of the analytic process. The codebook was modified as additional themes emerged and consensus was reached regarding the conceptual meaning of the new, emerging content. Two researchers analyzed each transcript to establish inter-rater reliability and attained greater than 85.0% agreement.

Axial coding was used to refine and create categories, as well as examine the relationships between categories and their respective subcategories. Selective coding was the final stage of analysis, which assessed the relationships between the various concepts and categories. Corbin and Strauss[26] recommended that grounded theorists constantly compare data during the research process. To achieve this, data and themes were systematically reviewed throughout progression of the focus groups. When new concepts emerged that required further exploration, additional questions were incorporated into later focus groups.

Concepts, which were represented by text segments, served as the unit of analysis for the study. Memo narratives were written to assist the researchers with organizing and understanding the data. To complement the thematic analysis, content analysis was employed to identify quotations that could personify the dominant themes from the focus groups in the participants' own words. These provided verbatim examples to illustrate further results of the thematic analysis.

Results

Sixteen students returned the demographic survey and participated in the focus groups. They ranged in age from 14 to 18 years. Forty-four percent of participants were male, all were Caucasian, and three-quarters reported living on limited incomes as evidenced by being in receipt of government assistance. These students were strong academically, with most reporting high grade-point averages. The majority reported that they exercised daily and rarely dined out; 31% described themselves as 'overweight.'

During open coding of the transcripts, eleven distinctive code words were developed (Fig2). Text segments associated with each code word were reviewed and analyzed to establish sub-themes, and relationships between code words or major themes were explored. Only results from the analysis for code words relating to weight perceptions are presented in this study.

Definition of healthy weight

In most instances, healthy weight was defined by physical appearance and how adolescents were perceived by others. Students expressed the belief that there was an appropriate size and shape, which was indicative of being a healthy weight. These perceptions were influenced by several external influences, such as media and peers. Females were more often concerned about physical appearance and indicated experiencing pressure to look a certain way. One group member said, *It's everything to a girl*. Another stated:

> *If you are always concerned about what people think about you, then you end up eating less and trying to look like people you think you're supposed to look like. Then, you end up weighing less than you are supposed to weigh. Then you end up being underweight.*

Healthy weight was also defined as a number on the scales that should be proportionate to one's height. This number was defined by expert opinions, such as those conveyed by their healthcare providers or other accepted standards, such as BMI.

DEF DIET	Description of the perceptions of what practices or foods comprise a healthy diet.
FOOD HAB	Current food intake practices of the adolescents and their peers.
SOURCES	Sources of food available to children/adolescents.
BAR FOOD	Barriers to eating a healthy diet, which includes what spurns poor intake habits.
DEF WT	Description of what was a healthy weight and what determined it.
OB PRACT	Practices used to avoid obesity or lose weight.
OB CON	Discussions regarding perceived consequences of obesity.
OB RATE	Description of students' perceptions about the extent of the obesity problem.
DISCUSS	Issues discussed with peers about healthy diet/healthy weight.
MEDIA	Description of the students' responsiveness to food advertising.
INFO	Sources of information about healthy eating and healthy weight.

Figure 2: Code words and definitions developed for analysis of focus groups transcripts.

Certain lifestyle behaviors were considered to be important in maintaining a healthy weight while others were considered to lead to becoming an unhealthy weight. For example, those who exercised regularly did not have to worry about the other factors related to body weight. Students also felt that those who participated in extracurricular activities had healthier weights; they also believed that people who have poor dietary habits, such as eating 'junk food' and snacks, and those who over-eat had unhealthy weights. Other students felt that weight was determined by physiological responses not under their control. Students believed that genetics plays an important role in determination of healthy weight. They felt that lifestyle behaviors did not contribute to a healthy weight in many instances, and that weight is dependent on genetic constitution.

Additionally, fear motivated one group member's definition of healthy weight. She expressed enormous psychological stress associated with other's perceptions of her weight. These emotions were also related to appearance and self-esteem. Finally, it is interesting to note that some participants were unable to define a healthy weight or discuss the components they believe comprised it.

Weight loss and maintenance practices

The most common practice used to avoid obesity or lose weight was restrictive dietary practices. Several students admitted to severely restricting food intake or 'not eating at all' during attempts to lose weight. This was specifically mentioned by a male participant who was a member of the wrestling team; he talked of not eating to achieve a lower weight class, which was common and often encouraged. Disordered eating practices, such as anorexia and bulimia, were also mentioned as means to avoid becoming overweight. One participant said, *Some people throw their stuff up. Yes, I know they do*.

Participants discussed episodes when they and their friends eat healthy for a certain amount of time to lose weight before returning to their regular habits and patterns of consumption. Some felt that healthy weight could be maintained by eating foods considered to be less healthy foods, such as candy and fast foods, in moderation and carefully watching portion sizes.

Many members from the groups discussed the importance of exercise to avoid weight gain as well as a means to lose weight. There were specific mentions of participating in extracurricular activities, as well as running or jumping rope

to lose weight. One student said, *I don't know, I think that everybody should have to participate in extracurricular activities to be average weight*. Lastly, more than one student discussed how kids in the schools take over-the-counter medications and/or supplements to control weight. Often, these were purchased by the parents.

Perceived consequences of obesity

The majority of students were concerned with the negative stereotypes that surround overweight persons. Overweight teenagers were ridiculed by their peers and made to feel inadequate or less important. One participant summarized it as:

> *Because the pressure that the kids put on you. I mean the people you live with and go to school around. It's like everybody making fun of people and talking bad about them. It's just people don't like to live like that. I know people in this school who quit, and half of them it's from people messing with them. I mean people pick on you and they talk about you and they don't treat you right because you don't look like what they call perfect.*

Various psychological consequences of overweight were expressed by students, especially among female participants. Issues of guilt and diminished self-esteem were prevalent. Also, a lessened feeling of belonging among peers and family was a perceived consequence of obesity.

Many students also discussed the long-term physical consequences of obesity. Chronic diseases, such as diabetes, high blood pressure, cardiovascular disease and hypercholesterolemia were mentioned. Generally, the students were familiar with many of these diseases because of the impact they have had on family members. Additionally, obesity was thought to limit physical functionality and made people less productive.

Perceived prevalence of obesity

Participants in the focus groups had various perceptions regarding the extent of the obesity problem, which ranged across the entire spectrum. Several students believed obesity was a serious problem, especially among their peers. One student remarked, *About half of them are overweight. Like the ones who aren't overweight eat like pigs and don't gain any weight*. Some adolescents were not overly concerned with the issue of overweight among their peers and felt that the rate of obesity was 'average for any school'; however, they recognized that a problem might exist, but that they had become desensitized over time due to the common nature of overweight among their peers. Someone stated, *I mean we go to school with these people. We see them every day. You just get used to it after a while*.

Finally, several students expressed no concern with the obesity problem among their peers. In one instance, the respondent stated that though several male peers in their school were overweight, these young men 'don't worry about it'. Another did not think that overweight was a problem at all.

Healthy weight discussions

Gender differences existed between male and female students with regard to weight discussions. Female participants indicated that discussions on weight were common among their peers. There were several references made about being 'fat' or 'fatness', which were illustrated by comments such as, *Well, I have countless friends who sit around saying 'Oh, I'm fat; I need to lose weight' and stuff like that*. Another girl stated, *Ninety-nine percent of the conversations that they have are about being overweight or being fat. At the time, they are not.* Males, however, indicated that 'guys just don't talk about' weight. They were more interested in talking about 'what they watched on television' last night.

Some members expressed the view that weight is a personal issue, and that overweight people may be offended when

issues related to diet and weight are discussed in their presence. For that reason, these students refrained from doing so in an attempt to not offend them or hurt their feelings; conversely, students reported that their peers made fun of, ridiculed, and tormented students with weight-related issues. They do not discuss weight directly but talk badly about overweight people and 'mess with them'. One participant articulated:

> *It's like everybody making fun of people and talking bad about them. It's just that people don't like to live like that…I mean, people pick on you and they talk about you, and they don't treat you right because you don't look like what they call perfect.*

Finally, there was some discussion about the consequences of being overweight among peers in reference to the long-term effects of excess weight, with specific mention of 'what's going to happen to you later in life'.

Sources of weight information and influences on weight

Family members, especially mothers, were cited as the most frequent source of information on weight. Additionally, some participants believed that if you played a sport, coaches were a source of information about healthy weight; wrestling coaches were mentioned specifically. Health professionals (medical doctors and registered dietitians) were also identified as sources of weight information; however, students were just as likely to rely on information received from peers, the internet and the media.

Perceptions of obesity, healthy weight, and beauty were shaped by what students watch on television or read in magazines. Participants described having bad feelings about their weight after seeing 'really thin' girls in magazines. One of the male participants jokingly made reference to 'looking at naked chicks' when the discussion turned to the way magazines portray thin or skinny as the gold standard. The media also influenced students to take diet pills by presenting them so attractively through promises of profound results.

Discussion

Data regarding the causes, implications, and perceptions of obesity in the Appalachian region are limited, despite disproportionate rates of obesity that continue to rise[20,22,23,27]. The Appalachian region is predominately rural, and persons residing in these areas maintain values and practices somewhat different from those living in more urbanized locations[18,28]. Additional issues, such as inadequate transportation, poverty, lack of access to medical care and lack of health insurance[20,27,29] directly impact the health and nutritional status of individuals in this region, thus leaving this population particularly vulnerable to obesity and other chronic diseases[28].

Generally, the state's residents are not healthy. According to the United Health Foundation's[30] 2005 Report, West Virginia is the 41st least healthy state in the US, and it ranks 48th in prevalence of obesity. Many of its children (24%) live in poverty[31], and overweight is prevalent, especially among the young. Cottrell et al[32] reported that approximately 33% of West Virginia kindergarteners in their study were either overweight or at risk for overweight. Similarly, another survey of West Virginia adolescents revealed a high proportion (35%) were overweight or at risk for overweight[24]. Clearly, obesity is a pervasive problem among Appalachian children and adolescents, making it important to understand cultural perceptions of weight among this group.

Adolescent perceptions of a healthy weight were rooted in physical appearance and external sources influenced personal weight status determination. Females were especially concerned about others' perceptions of their weight, often discussing weight and weight control practices with friends. These girls also admitted to being influenced by media and advertisements that portray very thin models. Research has reported that adolescent girls expressed body

weight dissatisfaction when exposed to 'idealized' female media images[33], and girls were regularly influenced to become thinner by the media and peers[34]. Similarly, Steenhuis et al[35] found that adult women who reported strong media influences were more likely to overestimate personal body weight.

In our study, Appalachian adolescent males, however, were less likely to be influenced by peers and did not report that the media influenced weight-related perceptions or behaviors. These findings are consistent with those of McCabe and Ricciardelli[36], who also found that peers had some influence on body image and weight control strategies but the media did not. These findings are particularly interesting when considering the rural isolation of many of the communities from which the data were collected. This is indicative of the pervasiveness of media influence, especially among rural adolescents.

Students in our study also identified certain lifestyle behaviors they believed were linked to healthy or unhealthy weights. Physical activity is an essential component of reaching and/or maintaining a healthy weight[37], and focus group members regularly associated exercise with a greater ability to maintain a healthy weight. Conversely, people with poor dietary habits, such as consuming excess 'junk food' and snacks, and those who over-ate had unhealthy weights, which is consistent with the dietary intake literature[11,38-40].

Even though excess energy intake was associated with unhealthy weights, participants continued to consume 'unhealthy' and 'junk foods', because the availability of healthy, nutrient-dense foods was at times limited in the home and school environments. Others living in Appalachia have reported similar accessibility issues as a barrier to consuming a healthy diet[27].

Adolescents attempting to lose or maintain weight sometimes subscribed to unsafe eating behaviors and practices. The most common practice used to avoid obesity or lose weight in the Appalachian adolescent sample was restrictive dietary practices. Both male and female participants admitted to severely restricting food intake or 'not eating at all' during attempts to lose weight. These findings are consistent with other studies that reported dieting and fasting as methods of weight control. One survey of high school students reported that 40.6% had dieted and 12.6% fasted during a 30 day period[41]. Additionally, Zullig et al[42] surveyed South Carolina adolescents and reported that approximately 15% of females in their study fasted to lose weight.

Disordered eating practices, such as anorexia and bulimia, and use of over-the-counter medications and supplements were also mentioned as means to avoid becoming overweight. In other investigations, female adolescents reported the highest use of diet pills for weight control; however, males also admitted such use[42,43]. Another study of US high school students reported that 7.6% used diet pills alone to control weight; when coupled with fasting, this percentage increased to 14.5%[41].

Often, overweight adolescents took part in weight control behaviors, similar to those listed above, because of ridicule received from peers. Such ridicule led to diminished self-esteem and a lack of belonging in social groups and was identified as a primary consequence of obesity in the present study. A similar study surveyed a diverse group of adolescents and determined that those who had experienced 'weight-teasing' regularly reported lower self-esteem and body image[44]. Previous research has shown that the psychological ramifications of obesity have been linked to suicidal thoughts and attempts in middle school adolescents[45]. Although suicide was not mentioned by participants in this study, further research in Appalachian youth should explore the scope of the psychological issues related to obesity and the extent of the problem.

Similarly, the adolescent focus group participants had varied and incorrect perceptions regarding the extent of the obesity problem. While a few did not recognize the problem as significant, most felt the rate of obesity was of serious concern, especially among teenagers. Additionally, they recognized that their perceptions of weight might be skewed,

because they are regularly surrounded by overweight persons. These findings are similar to those of Cottrell et al[32], who found that 47.6% of parents with overweight children perceived the children as having appropriate weights. Other studies confirmed that people often underestimate their body weights, failing to place themselves in appropriate weight categories[35,46]. Brener et al1[17] reported that greater than 20% of high school students who were overweight or at risk for overweight perceived themselves to be underweight.

Participants from the present study also identified other, more long-term consequences of obesity, such as diabetes, high blood pressure, cardiovascular disease and hypercholesterolemia. They expressed familiarity with these diseases because family members have suffered from them. Given the increased rates of chronic disease and the resultant attitudes toward these diseases in West Virginia and the Appalachian region, such findings were expected[47]; however, West Virginia adults indicated perceptions of a general lack of medical knowledge among many of their peers[20]. These data may indicate that the pervasiveness of obesity in the region has impacted the normative perception of normal weight. Despite the greater weight being considered normal, the adolescents seem to be more aware of the ramifications of excess weight, such as the numerous obesity-related chronic diseases.

The investigation provided a wealth of information on weight perceptions in Appalachia. While information on individual perceptions of weight is not prevalent in the literature, it appears that Appalachian adolescents maintain some attitudes, perceptions and behaviors similar to those of their counterparts in other geographic regions; however, particular cultural values related to weight, obesity and weight practices were also expressed. Additionally, Appalachian adolescents also reported unique issues with accessibility to and availability of health promoting foods and healthy weight information, which were not located elsewhere.

The study yielded useful weight perception data, but several limitations exist. Focus group participants were part of a convenience sample, which was not representative of the state; therefore, results cannot be generalized. The focus groups took place after school hours in very rural areas and some in inclement weather; therefore, participants who attended were motivated students, which may be atypical of the state's rural adolescent population. Additionally, no participants from one of the schools arrived for the focus groups. A single student stayed after school to attend the group, but her parent did not have adequate funding for transportation and was unable to attend. These reflect some inherent issues when conducting research in rural areas among 'hard to reach' populations. Finally, results are limited due to the nature of qualitative research, which relies on researchers as the instruments; however, both primary investigators were raised in the Appalachian region and coded data independently with high levels of agreement.

Conclusion and implications

The results of the study indicate that Appalachian adolescents engage in unsafe weight control behaviors and have distorted perceptions of healthy weight, which may be related to cultural values and norms. They both underestimated and overestimated the magnitude of overweight and provided inaccurate information related to healthy weight. Based on these perceptions, adolescents are at varied levels of readiness for action and multiple educational opportunities exist for obesity prevention initiatives in school-based health centers and the home and school environments.

Information gleaned from the focus groups will be useful in developing more extensive, widespread research inquiries, which will assist in developing obesity prevention initiatives targeting Appalachian adolescents. Given the disproportionately high rates of obesity in the region, culturally appropriate prevention strategies could have a significant impact on the obesity problem. Results of the study should be shared with school-based primary care

providers, school administrators, parents and adolescents, and key stakeholders need to be assembled to ascertain best approaches to combat obesity in the region.

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