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RESEARCH - SURVEY

Cultural hair practices, physical activity, and obesity among urban African-American girls

Felesia Bowen, PhD, DNP, APN (Assistant Professor and Francois-Xavier Bagnoud Endowed Chair in Community Pediatric Nursing)[1] & Patricia O'Brien-Richardson, PhD, MS, Ed (Interim CEO)[2]

[1]Rutgers School of Nursing, Rutgers University, Newark, New Jersey
[2]Rutgers Community Health Center, Rutgers School of Nursing, Rutgers University, Newark, New Jersey

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Correspondence
Felesia Bowen, PhD, DNP, APN, Rutgers School of Nursing, Ackerson Hall Room 326, Rutgers University, 180 University Avenue, Newark, NJ 07102. Tel: 973-353-3843;
E-mail: fbowen@sn.rutgers.edu

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Abstract

Background and purpose: Hair holds cultural meaning and value for women of African descent. The values placed on hair type and hair style date back to preslavery days. There is a small body of literature that addresses the relationship between cultural hair practices and physical inactivity among black women. Understanding this is important because inactivity during childhood and adolescent years contributes to increased weight-related morbidity and mortality during adult years. The purpose of this study was to determine the relationship between cultural hair practices, physical activity, and obesity among urban African-American adolescent girls.
Methods: A convenience sample of 50 African-American girls completed questionnaires and were weighed and measured for body mass index (BMI) calculation.
Conclusion: Cultural hair practices such as the amount of money ($p = .047$) and time ($p = .015$) spent on hair maintenance were associated with decreased physical activity but were not associated with BMI.
Implications for practice: Inactivity during adolescence can result in obesity, a major cause of chronic health conditions that contribute to morbidity and mortality as an adult. When nurse practitioners understand and appreciate the cultural differences and beliefs around cultural hair practices they will be able to develop culturally appropriate strategies that will aid in weight loss.

Introduction

There is a small but growing body of literature addressing the relationship between cultural hair practices, physical inactivity, and obesity among black women. However, research has not included African-American (AA) adolescent girls, particularly those in urban communities. Understanding this phenomenon is important because inactivity during childhood and adolescent years contributes to increased weight-related morbidity and mortality during the adult years.

African American hair

Hair holds cultural meaning and value for women of African descent. The values placed on hair type and hair style date back to preslavery days. Prior to slavery, Africans used hair to communicate meaning and status such as wealth, age, religion, marital status, and tribal and ethnic associations (Byrd & Tharps, 2014). Chemically there is no difference between AA hair and the hair of other ethnic groups. The chemical makeup of hair consists of trace elements, lipids, proteins, water, and pigment (Berardesca, Leveque, & Maibach, 2007). However, physical differences exist between the hair of AAs, Caucasians, and Asians. The shaft of AA hair is flat compared to the elliptical shape of Caucasian and Asian hair (Figure 1). Because of the flat shaft, the hair does not grow straight but rather it curls on itself. The curling of the hair shaft prevents oils produced on the scalp from distributing down the shaft of the hair. This contributes to dryness and fragility of the hair, especially the ends (Berardesca et al., 2007). This is why AAs usually do not wash their hair daily but at most once a week (Berardesca et al., 2007). The hair of AAs can be straightened permanently with chemicals by a process known as hair relaxing. However, as new hair grows

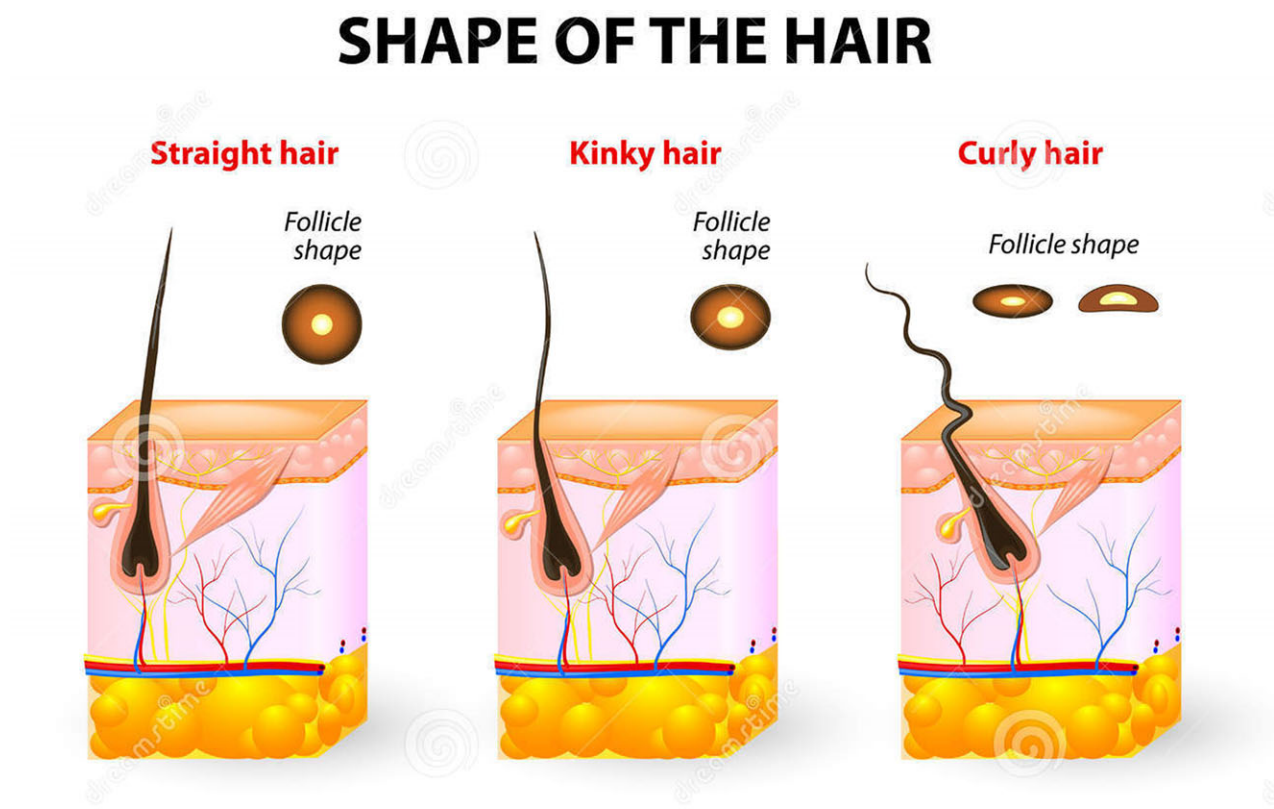

Figure 1 Hair shape ((c) Designua/Dreamstime.com Used with permission).

from the scalp it will continue in its natural growth pattern of spiraling and curling, and a clear distinction can be seen between the previously relaxed hair and the new growth. Hair can also be straightened temporarily with heat through a process known as pressing which uses a hot comb—a metal comb that is first heated then passed through the naturally curly hair. This process can also be accomplished with a flat iron. Hair that is straightened by heat is highly susceptible to moisture that includes sweat from the scalp (Berardesca et al., 2007). The products and routines required to maintain AA hair and hair styles can be quite costly financially and can consume a great deal of time. Therefore, hair care following physical exercise is not easy for AA women and girls.

Sociocultural factors associated with obesity in AA women include hair and hair-care practices. Data from several studies have identified cultural hair management as a barrier to physical activity (PA) among AA women (Barnes & Kimbro, 2012; Hall et al., 2013; Versey, 2014; Walker, 2012). In an effort to understand psychosocial experiences related to weight loss and hair care as it relates to exercise for body weight management, Gathers and Mahan (2014) surveyed 200 AA women between the ages of 21 and 83. Forty-five percent of the respondents reported that they avoid exercise because of hair concerns, and 22% felt that their hair-care regimen impeded their ability to maintain a healthy body weight. In a similar study, 51 AA women between the ages of 18 and 75 were surveyed. Twenty-nine percent of the respondents reported that they did not exercise regularly because of hair maintenance (Huebschmann, Campbell, Brown, & Dunn, 2016).

Physical activity

PA is well established as a means of preventing and treating obesity (Ladabaum, Mannalithara, Myer, & Singh, 2014). PA is purposeful movement produced by skeletal muscles as a result of energy expenditure (World Health Organization [WHO], 2010). PA is different from exercise. Exercise is a type of PA that is planned and purposeful with the main goal being the improvement or maintenance of a physical fitness (WHO, 2010). Thus, PA is conceptually different from exercise because it comprises both exercise as well as movement associated with activities of daily living such as playing, house cleaning, active transport

(biking, skating, walking), and other recreational activities (WHO, 2010). Guidelines developed by the U.S. Department of Health and Human Services (USDHHS) recommend that children between the ages of 6 and 19 years old participate in at least 1 h of PA daily and this activity should be aerobic in nature (USDHHS, 2008). However, students of all races and gender are falling short of these recommendations (Centers for Disease Control and Prevention [CDC], 2017). PA can be accomplished in school settings through students' participation in recess, intra- and extramural sports, and active transport to and from school (National Association for Sports and Physical Education [NASPE], 2008).

Physical education (PE) classes (i.e., gym class), a routine component of primary and secondary school curricula in the United States, provides instruction on PA, physical competence and health-related fitness, and active engagement in PA such as sports and games (NASPE, 2008). According to the NASPE (2008), high-quality PE programs that occur daily and when performed properly, result in increased PA by students. In the United States, PE is compulsory for high school students. However, rigorous PA that contributes to caloric burn may not routinely occur during PE classes. A national survey of adolescent PA revealed that only 27% of the youth surveyed met the daily recommendations for PA and 29% of those youth reported participating in PE classes (CDC, 2017). Among surveyed youth, males reported participating in daily PA (36.6%) and PE class (34.9%) more often than female students (17.7% and 24%, respectively; CDC, 2015).

AA girls who live in low-income, urban communities face complex barriers to PA such as financial, social, and environmental constraints that are not easily overcome (Sallis, Floyd, Rodriguez, & Saelens, 2012). Limited access to parks and recreational facilities; lack of ample, safe, walkable spaces; increased prevalence of crime; and the social milieu limit options for safe PA in this group (Sallis et al., 2012). PE classes provided by schools are often the only source of safe, high-quality PA for students (Duncan, Strycker, & Chaumeton, 2015).

Obesity

Participating in PA is an important preventive measure against obesity and obesity-related diseases. Obesity is a complex health phenomenon influenced by sociocultural, environmental, genetic, and epigenetic factors, and it is highly correlated with social determinants of health such as poverty, chronic stress, and depressed physical environments ((Bryant, Hess, & Bowen, 2015). Overweight and obesity are conditions of malnutrition that are characterized by excessive body fat. These conditions are diagnosed with body mass index (BMI), an index of height for weight that is calculated by dividing an individual's weight in kilograms by the height in square meters (WHO, 2016). Overweight is defined as a BMI between 25 and 29, and obesity is a BMI greater than 30 (CDC, 2009). Obesity is further classified as Class I (BMI 30–35), Class II (BMI 35–40), and Class III (BMI greater than 40; CDC, 2016).

Obesity continues to be a public health concern contributing to decreased life expectancy and escalating healthcare costs (Kitahara et al., 2014; Segal, Rayburn, & Martin, 2016). Obesity is also the common denominator in most preventable chronic diseases in the United States with an annual cost of $147–$210 billion (Cawley & Meyerhoefer, 2012; Segal et al., 2016). The lifetime cost of childhood obesity is estimated to be $19,000 per child (Finkelstein, Graham, & Malhotra, 2014). Overall obesity rates have declined in the United States. However, AAs and their youth continue to be disproportionately affected by overweight and obesity. These factors put them at a greater risk for obesity-related diseases such as type 2 diabetes, hypertension, cardiovascular disease, cerebral vascular disease, and cancer during their adult years (Agyemang & Powell-Wiley, 2013; Alhassan, Greever, Nwaokelemeh, Mendoza, & Barr-Anderson, 2014; Segal et al., 2016). Nationally, boys tend to be more obese than girls (Segal et al., 2016). However, when compared to AA boys (43% vs. 37%) and all other groups, AA adolescent girls have a higher prevalence of overweight and obesity (Ogden, Carroll, Kit, & Flegal, 2014; Segal et al., 2016). During the adult years, AA women experience the highest rates of overweight and obesity (56.6%) when compared to women of all other racial groups (36.5%). Therefore, prevention of obesity and maintaining a healthy weight during the adolescent years can have a protective effect during adulthood.

Purpose

The purpose of this study was to determine if a relationship exists between cultural hair practices, PA, and obesity in urban AA girls.

Methodology

We used a cross-sectional survey design. Data were collected over a 1-week period in June 2016.

Ethical considerations

This study was approved by the Rutgers University Biomedical Health Sciences institutional review board (IRB) and the high school principal of the participating high school.

Table 1 Descriptive statistics for demographics and study variables ($n = 50$)

	Range	Mean	*SD*	*n*	Percentage
Demographics					
Age	14–21	17			
Grade	9–12	11			
BMI category					
Underweight	16–18	17		3	<1
Normal	19–25	22		16	32
Overweight	25–30	28		14	28
Obese	31–45	36		17	34
Hair type					
Straight	2				<1
Wavy	5				1
Kinky-curly	16				32
Kinky-oily	24				48
PA outside of school					
Less than 1 h a week				24	48
Between 1 and 2 h a week				14	28
More than 2 h a week				12	24
Hair hygiene					
How often do you wash your hair?					
Everyday				13	26
Once a week				12	24
Twice a week				13	26
Once a month				5	1
Twice a month				5	1
Less than once a month				2	<1
How long does it take to wash, dry, and style your hair (minutes)	10–240	60.48		(1 h and 48 min)	
How long do you spend at the salon (minutes)	0–420	108.6		(2 h and 20 min)	
How much does it cost to get your hair done?					
$0				5	10
$11–$20				0	0
$21–$30				5	10
$31–$40				10	20
$41–$50				9	18
$51–$60				4	8
$61–$70				2	4
$71–$100				6	12
$101 or more				4	8

Inclusion criteria

To participate in the study, the girls had to be a student at the selected high school, identified as AA, and be able to speak and read English proficiently. Because the aim of this study was to specifically understand the relationship between cultural hair practices among AA adolescent girls, males and girls from other ethnicities were not included.

Sample

A convenience sample of 50 AA girls in 9th through 12th grade who attended the participating urban high school was invited to take part in this study. All of the girls were at or below poverty level as surmised by their participation in the free lunch program. Study sample characteristics are summarized in Table 1.

Instruments

Investigators developed the Cultural Hair and Activity Instrument (CHAI) for this study. Items were developed based on a review of empirical studies that examined hair as a barrier to exercise in adult women. The CHAI contains 74 items that are grouped into four subscales: hair type, hair hygiene, PA, and subjective perceptions. The hair-type subscale presents a visual representation of four common hair types associated with AA women and girls (Figure 2). Respondents are instructed to look at the visual representation and select the image that is most like their

Figure 2 Cultural hair and activity instrument (CHAI).

hair type when it grows from their scalp. The hair hygiene subscale contains items focused on frequency of hair washing, the type of maintenance involved during (special shampoos, deep conditioning) and after washing (blow dry, pressing, braiding, etc.), and the time and costs associated with these activities. The PA subscale is comprised of items focused on the frequency, location, and type of PA in and out of school. Respondents are asked to report if they participated in PA in or out of school, the amount of time they participated in PA and when they did participate in PA, how long it was before they began to sweat. Questions like "I exercise less than one hour a week when I am not in school" were presented and participants checked a box for either "yes" or "no." This subscale also includes items that focus on the extent to which participants agree/disagree (1 = disagree a lot to 5 = agree a lot) on how hair influences their participation in PA. Examples of these items are "I do not participate in gym because of my hair"; "My hair affects how much I participate in gym class"; and "I could be healthier if I exercised more." The subjective perceptions subscale comprised open-ended questions that focus on participants' feelings about their hair and their perceptions of barriers and facilitators to PA in and out of school. The CHAI also includes demographic items such as age, gender, grade, and ethnicity.

The internal consistency reliability coefficient was 0.693 for PA subscale items focused on participants' ratings of the extent to which they agree/disagree with hair influence on PA. This reliability is considered acceptable for a new instrument (Tabachnick & Fidell, 2013).

Height and weight were measured using the Health O Meter 500KL (Sunbeam Products, Boca Raton, FL) digital scale. This scale measures weight up to 500 lbs and height up to 84 inches. The CDC online BMI calculator for children and teens was used to compute participants' BMI.

Data collection

IRB-approved flyers were placed on bulletin boards in the school's halls, the girl's locker room, and the cafeteria. Smaller flyers were also distributed to girls at the end of the school day as they left the building. Girls who expressed interest in the study were screened for inclusion. Those who met inclusion criteria were given an informed consent form to take to their parent or guardian to complete and return to school. Parents and guardians who had questions about the study were advised to contact the study team to clarify any questions. Girls under 18 years old were asked to sign an assent form. Girls 18 years and above consented for themselves.

Data collection took place during the school lunch period. The participants met in a designated room provided by the school principal. The purpose of the study was reviewed and participant questions were answered. To ensure confidentiality and anonymity, the participants were instructed not to put their name on any of the study forms. After completion of the CHAI, participants' height and weight were measured, and their BMI was calculated. Because data collection took place during the lunch hour, participants were offered a healthy lunch and snacks in the study area. At the end of data collection, participants received a $10 gift card as a small token of appreciation of their time.

Data analysis

The data were entered into and analyzed using the IBM Statistical Package for the Social Sciences (SPSS) release 23.0 (IBM Corp., Chicago, IL). Descriptive statistics were used to analyze demographic data and describe the study sample. Chi-square analysis with phi was used to determine relationships between hair type, PA, and

Table 2 Qualitative responses of the impact of hair on gym participation

Question	Responses
How has your hair routine (the way you style it, the amount of money, and time you spend on your hair, etc.) affected your participation in gym class?	"Jumping around sweats out my hair, I get blow outs." "It doesn't affect it at all." "My hair really doesn't get messed up." "I might sweat out my weave that I did not pay for and get in trouble." "Usually, if my hair is straight, I don't work as hard." "If I got a perm and doobie, I will not participate in gym class" "If I spend a lot of time [on my hair] I won't mess it up." "[I] do my hairstyle but in gym class [I] sweat it out and it pulls out."
What have you been taught about how to care for your hair while being physically active?	"I have been taught how to pin curl [my] hair if I don't want it in the way." "I have been taught nothing about taking care of my hair while being physically active." "Your hair doesn't matter, your grade does." "What I have been taught is that your hairstyle is important about how you take gym." "Tie your hair up and wash it when your hair sweats." "What I have been taught about my hair is that I should not wash it too much and always cover my hair when I get a doobie." "Not to do too much." "I have not really been taught a lot because I'm black women my hair don't look as good as other girls does. So I get teased a lot and ask a lot of questions like why my hair is so short." "Tie it up and when I go home dry shampoo if it's sweaty."
If you could have a class on how to take care of your hair what would you want to learn?	"A safer way to not sweat it out." "I would like to learn about how to keep [my] hair straight." "I would like to learn how to maintain my natural hair." "I would like to learn how to keep my hair neat." "How to make it last so it wouldn't mess up." "I would like to learn other ways to stretch and keep my hair moisturized." "Ways to protect my ends without all [of] the work." "How to keep my hair looking nice." "I would like to learn how to control it." "I would love to learn so I could feel better about myself and how I look." "I would like to learn how to treat my hair very well because I have a natural hair." "Everything because hair is [a] woman's beauty."

BMI. For this analysis, data were recoded as follows: (a) hair-type variables were dichotomized into easy to manage (straight and curly) and harder to manage (kinky-coily and kinky-curly) hair types; (b) BMI scores were arranged into four categories: underweight (BMI less than 18), normal (BMI 18.5–25.9), overweight (BMI 26–29.9), and obese (BMI 30–34); and (c) the amount of money the girls spent on hair-care maintenance varied from $0 to greater than $101. Therefore, we grouped the amounts into nine ranges. Exemplars of open-ended question responses are provided in Table 2.

Table 3 Relation of PA and BMI with hair hygiene using chi-square analysis

Variable	Chi-square	df	Significance
PA (1 = Yes; 0 = No)			
Cost of hair service	21.196	12	.048
Time spent on hair	10.510	3	.015
Hair type	3.125	3	.373
Boys in gym class	13.160	1	.000
Changing for gym class	3.944	1	.047
BMI (four levels)			
Cost of hair service	12.937	9	.165
Time spent on hair	12.935	9	.970
Hair type	3.918	3	.270
Boys in gym class	1.771	3	.621
Changing for gym class	1.793	3	.616

Results

Table 1 provides a description of study variables. Forty-three participants reported that they had hard to manage hair compared to only seven participants who reported easy to manage hair. Twenty-four participants reported less than 1 h of PA a week when not in school, compared to 14 who reported between 1 and 2 h, and 12 who reported more than 2 h. The cost of hair-care maintenance varied widely among participants and ranged from $0 up to $150 per hair-care session. The mean dollar amount spent was $36.32 (*SD* $40.146). The amount of time participants spent engaged in hair maintenance (i.e., washing, drying, styling) ranged from 10 min to 4 h. Sixty-two percent of participants were either overweight or obese.

Chi-square analyses revealed significant associations between cultural hair practices and PA but not BMI. Higher amounts of money spent by participants on hair maintenance were significantly associated with less participation in PA (see Table 3). On the other hand, there was no significant association between the amount of money spent on hair maintenance and BMI (see Table 3). Similarly, the more time participants spent personally engaged in hair

Table 4 Number of girls with easy versus difficult to manage hair by BMI category

	BMI category				
Hair type	Underweight Less than 18	Normal weight 18.5–25.9	Overweight 26–29.9	Obese 30–34	Total
Easy to manage	0	2	4	1	7
Difficult to manage	3	14	10	16	43
Total	3	15	14	17	50

Table 5 Perceptions of the impact of hair on gym participation ($n = 50$)

Question	Response	Frequency (%)
Being physically active is important for my health	Agree a lot	22 (44)
	Agree	16 (32)
	Unsure	8 (16)
	Disagree	2 (4)
	Disagree a lot	2 (4)
I could be healthier if I exercised more	Agree a lot	23 (46)
	Agree	15 (30)
	Unsure	4 (8)
	Disagree	5 (10)
	Disagree a lot	3 (6)
My hairstyle affects how much I participate in gym	Agree a lot	7 (14)
	Agree	5 (10)
	Unsure	5 (10)
	Disagree	16 (32)
	Disagree a lot	16 (32)
I would participate if my hair would not be affected	Agree a lot	10 (20)
	Agree	13 (26)
	Unsure	8 (16)
	Disagree	8 (16)
	Disagree a lot	11 (22)

maintenance (i.e., washing, drying, styling) was significantly associated with lower levels of PA (see Table 3). There was no significant association between the amount of time spent on hair maintenance and BMI. Notably, hair type was not significantly associated with either PA or BMI. Cross-tabulations (see Table 4) indicate that, despite hair type, a majority of participants with either hair type (i.e., easy to manage; difficult to manage) were either overweight or obese. Lastly, the presence of boys in PE class and having to change for PE class was negatively associated with girls' participation in PA in school.

We also examined the girls' perceptions of the impact of their hair on their willingness to participate in gym. These findings are reported in Table 5. Overwhelmingly (78%), the girls in this sample agreed that participating in PE class was good for their physical health and that they could be healthier if they exercised more (76%). Yet surprisingly, only 24% of the girls agreed that their hair affected how much they participated in PE class, and 46% agreed that they would exercise more if their hair was not affected. This suggests that there may be factors that are more influential on their decision to participate in PE class than hair maintenance alone. In open-ended questions, participants reported that their school did not have shower facilities for the girls and they were not given enough time between classes to "freshen up."

Discussion

Findings from this study suggest that cultural hair practices may have a significant effect on AA girls' PA participation. The cost of hair maintenance and the time spent on hair maintenance influenced the girls' level of PA in the study sample. Our participants were overwhelmingly aware of the importance and benefits of PA on their personal health, yet they chose not to participate because of concerns for their hair. These findings are consistent with the findings of Gathers and Mahon (2014) who found that AA women did not participate in physical exercise because of hair concerns.

Coed PE classes and the associated need to change clothes at school were also identified as activities that negatively influenced the girls' participation in PA in school. Some of the girls reported being teased about their bodies by the boys in the class. These negative experiences may have contributed to the strong associations between coed PE class and PA. Changing for PE class and not being able to freshen up afterwards or have time to fix their hair after class was also identified as a significant barrier for study participants. Adolescence is a time when boys and girls are more conscious of their bodies and concerned with physical appearance. Not all schools have the resources to provide in-school showers, or showering may be discouraged because of security reasons. One way to address these concerns may be to offer a girls' only PE class later in the school day for girls who would prefer not to participate in PE classes with boys. Additionally, providing an option for a final period PE class would alleviate the problem of not having shower facilities at school. Students would be able to leave school and freshen up at home.

Future qualitative studies may assist in gaining a better understanding of the phenomenon of hair as a barrier to

PA in AA girls. The data could provide a rich understanding of cultural beliefs about hair and how hair shapes PA. The data could also begin to inform a culturally relevant intervention aimed at increasing AA girls' participation in PA while taking into account their hair concerns.

Limitations

The homogenous AA sample was intentional because of the purpose of the study. The small sample size thus limits the ability to generalize findings. According to the Raosoft online sample size calculator (Raosoft, 2004), for an effectively powered study with a confidence interval of 95%, we would have needed 377 participants. Future studies will be adequately powered. Participants were asked to self-identify as AA. In reality, there may have been girls who were of African descent but not descendants of slaves (AA). The demographics of the community include Dominican, Nigerian, and Haitian families. Cultural differences between these groups could have influenced some of their responses and perceptions of their hair. Questions regarding where the girls were born and where their parents were born (African countries or the Caribbean Islands) would do more to differentiate AAs from other blacks. Additionally, revising the demographic portion of the questionnaire to allow participants to identify where they feel they belong in the African diaspora will be helpful. The CHAI was developed for this study and has a mixture of response options for the various sections. Future studies should be devoted to improving the psychometrics of the instrument and validating it for use with other ethnic and age groups.

Conclusion

The details of skin and hair differences between different cultural groups may not be thoroughly covered in most advanced practice physical assessment courses. Nurse practitioner (NP) students are taught to assess the skin and hair in terms of wellness and disease. However, little to no time is spent on the physical differences of hair, cultural meaning, grooming, and maintenance practices. Findings from this study are important for NPs who work with AA children and adolescents. For children and adolescents who are diagnosed as overweight or obese, the primary treatment consists of diet modification and increased PA. Recognizing that barriers to PA exist in this ethnic group, NPs may want to consider a shared decision model when working with AA girls who are overweight/obese. Understanding that hair is important culturally and that it is structurally different can help the NP work with the AA adolescent female to develop a PA regimen that takes into account cultural hair differences and preferences. Inquiring about hair type, hair maintenance routine, including how often the hair is washed and how long the hair maintenance routine takes, may elucidate whether or not hair maintenance is a barrier to PA for the patient. With this information, the NP will be able to suggest modifications in PA that will still be beneficial for weight loss and maintenance. Activities such as brisk walking, yoga, and weight lifting are less likely to cause the patient to perspire heavily but are still adequate for calorie burning. Assessments of AA female girls' willingness to participate in more cardio-intensive PA such as jogging and climbing a day or two prior to engaging in hair maintenance may be necessary.

A sedentary lifestyle during childhood results in overweight and obesity, which are major causes of chronic health conditions that contribute to morbidity and mortality during adulthood. When NPs understand and appreciate cultural difference among their patients, they are able to begin a realistic and culturally appropriate conversation regarding health and illness prevention. Addressing lifestyle changes for AA women during the adolescent years may contribute to better health outcomes as they age into adults.

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