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Meal patterns and food choices of young African American men: understanding eating within the context of daily life

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Abstract

Although young African-American males are at particularly high risk of developing hypertension at an early age, dietary interventions that have successfully reduced blood pressure among African-American adults have not been translated into programs for this group. Life contexts such as school enrollment, competitive athletics, and employment influence the daily activities and meal patterns of African-American males. This study explored the activities of young African-American males to identify opportunities to increase healthful food choices. A purposive sample was recruited which included five groups of African-American males (15–22 years of age, n=106): high school athletes and non-athletes, college athletes and non-athletes, and non-students. A structured interview guided participants through a description of their activities, meal patterns,

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and food choices over the course of a typical weekday. Common elements emerged that provided a contextual view of the participant meal patterns and food choices. These elements were sports team participation, college employment, school as a food source, non-student status, and eating dinner at home. These findings suggest opportunities for the design of dietary interventions for young African-American males which take into consideration how school, athletics and employment may influence opportunities to eat regular meals that include healthful foods.

Keywords

minority health; hypertension prevention; meal patterns; food choice; African-American men's health; qualitative research

It has long been recognized that hypertension (HTN) prevention programs are needed for young African-American men (1–3). Although dietary approaches to lowering blood pressure (BP) have been successful for older African-Americans, they have not been translated into programs for young African-American males (4–8), yet dietary change is imperative for those at risk in this population (9–12).

In research with African-American teens at risk of developing HTN, school status, athletic team participation, work schedules, and sleep patterns influenced food selection and meal frequency (13,14). These differing contexts not only affect the daily activities of young males but shape their environments and influence health-related actions (15–20). Further, understanding how daily routines influence eating is essential because when behavioral and environmental determinants are integrated into health promotion, results are more likely to be sustained (21, 22). Therefore, as part of an effort to develop relevant HTN prevention programs for young African-American males, we explored the activities, meal patterns, and food choices with a purposive sample of young African-American males who differed in school, work, and athletics in order to create a picture of how eating took place within the context of their daily routines.

Methods

Study Design and Participants

Participants were 106 self-identified African-American males ages 15–22 years living in a mid-sized metropolitan area of the Southeast. The purposive sampling plan included high school and college students and young males who were not in school, i.e. non-students (23, 24). Within student groups, both sports team members and those not on teams were recruited. The university's institutional review board approved the study, and informed consent was obtained from those 18 years and older; parental consent and participant assent were obtained for those under 18. Participants received a \$25 gift card after completing the interview.

Recruitment used a site-based sampling approach (23); sites were comprised of 25 organizations, including school health programs, college organizations, athletic departments, churches, barber shops, recreational programs, job training centers and health fairs. Researchers established relationships with key contacts within each organization. These leaders had trusting relationships with individuals meeting the study criteria, and they facilitated recruitment by informing the research team of the times when potential participants normally attended programs or activities at their sites. The research team conducted interviews at these times or scheduled participants for another date. Communication with participants was maintained via e-mail, cell phone calls and text messages.

Data Collection

The first author or one of three research assistants (RAs) conducted all interviews. The RAs were trained by the first author, who has had extensive experience in conducting qualitative research among African-American adolescents and adults. The interviewers were female and white or African-American; RAs were in their 20's and the first author was middle aged. The interviews took place during the school year in unoccupied offices, conference rooms, and library study rooms at or near recruitment sites. Interviews (70 minutes) included a structured meal pattern timeline interview (20–25 minutes) and height, weight and BP were measured. The interview also included a questionnaire of descriptive information, HTN knowledge and beliefs, health literacy, work status, typical physical activity and smoking patterns. This present report focuses on the descriptive characteristics, daily activities, and meal patterns portion of the interview.

Meal Pattern Timeline Interview

The meal pattern timeline interview was a structured guide (24) developed by the research team that facilitated dialogue between the participant and interviewer about typical weekday activities and eating patterns. It was based on qualitative interviews in which African-Americans aged 17–20 years described their typical eating patterns and factors influencing their dietary behaviors (13,14). This prior research found that variations in diet and activities between participants were greater on weekdays as compared to weekends; thus this investigation focused on weekdays (13). Four physicians with experience treating and conducting research with African-American adolescents and young adults with or at risk for HTN reviewed the interview guide. Following these reviews, a question about energy drink usage was added to the interview. The guide was then piloted with four individuals representing the study population (data not included); feedback was positive and no additional changes were made.

During the meal pattern timeline interview, the interviewer recorded the participants' responses on a horizontal line labeled with the hours of the day. First, wake and sleep times were marked. Second, locations throughout the day and time spent at each were indicated on the line. Then, times and locations of meals were recorded and whether the meal was eaten regularly (3–5 days/week) or sometimes (1–2 days/week). Participants identified eating occasions as either specific meals (breakfast, lunch, and dinner) or snacks. Finally, foods typically eaten at each meal were listed below each eating occasion and the source of each was noted. Vitamin and energy drink usage were also noted. At the end of the interview, participants reviewed the timeline with the interviewer and any necessary changes were made (25,26).

Data analysis

The PI/first author and RAs met weekly to discuss the meal pattern interviews and the patterns of activity and eating that were emerging. Based on these discussions and a review of the first half of the interviews, a database was established in which meal pattern variables, such as the type and timing of daily activities, meal types, timing, locations, food choices, and sources were recorded by a RA. A second RA reviewed all data entry to ensure accuracy.

Using a variable-based approach to the analysis (27), we constructed matrices with columns for each meal pattern variable and rows corresponding to the five participant groups. For each meal pattern variable, these matrices captured either numbers of participants, such as 18 high school students not on an athletic team ate a banana for breakfast or an average value, such as non-students slept an average of 8 hours of sleep each night. Foods that were consumed frequently by each group were summarized (defined as when one-third or more of

participants ate an item at a particular meal). From the matrices, the PI developed summary profiles describing the daily activities, meal patterns, and food choices of each participant group. RAs reviewed the summaries to ensure that they captured their impressions of how meal patterns varied within the daily context for each group. From these summaries, the research team identified key elements that reflected how the daily activities of participants influenced meal patterns and food choices.

This report includes meal pattern timeline results and descriptive information collected including age, education, living arrangements, work status, smoking habits, parental education (considered an indicator of socioeconomic status), and structured physical activity (PA) (i.e., time spent in the gym, exercise facility, or at sports practice).

Results

Between November 2008 and December 2009, 106 participants were interviewed, including 13 high school students not on athletic teams (HS), 27 high school students on athletic teams (HA), 26 college students not on athletic teams (CS), 16 college students on athletic teams (CA), and 24 non-students (NS). Table 1 provides descriptive information of participants. Most HS were in the 12th grade, and HA were distributed across the high school grades. College students were primarily juniors and seniors. Half of NS had completed high school, but several were not high school graduates; several had some college and one was a college graduate. The parents of college students were the most educated. High school students all lived with their families. College students were fulltime students and lived with roommates. NS had the most varied living arrangements; half lived with parents, a third with roommates or a partner (two households included children), one lived alone, and the rest with other family members. Body mass indices were comparable across groups ranging from 25 to 27. The majority of the nine smokers were NS.

The types of activities, meal locations, and food sources were similar; however what varied were duration, frequency, and foods selected. Weekday hours were spent at school or on campus (except for NS), in gym or sports practice, at work, home, and in other activities (primarily visiting with friends). Meals were eaten at home, the school cafeteria, or work. Few ate weekday meals at fast food or sit-down restaurants or at other people's homes. Food sources included home (foods purchased in advance and available at home), cafeterias, fast food outlets, vending machines, and convenience stores (college campuses all had fast food outlets, coffee shops, and convenience stores). Consuming foods and beverages between meals was common to all groups averaging about three snacks a day- typically snack cakes, cookies and chips from convenience stores and vending machines, and leftovers or convenience foods at home. Between meals, most participants drank sweetened beverages or water; sports drinks were more popular among the athletes. Table 1 provides details on the activities and meal patterns of each group.

From the group summaries, common elements emerged that provided a contextual view of the participant meal patterns and food choices. These elements were sports team participation, college employment, school as a food source, non-student status, and eating dinner at home. Figure 1A–C and 2A–B illustrate how these dimensions are reflected in the daily lives of five actual participants.

Sports Team Participation

As shown in Table 1, athletes spent more time sleeping and ate more meals regularly than non-athletes in school, and timed their meals and snacks to precede or follow sports practice. The impact of athletics was most pronounced for CA who spent almost 3 hours each day in

training. HA spent over 2 hours a day in the gym and participated in multiple team sports. In contrast, most CS exercised less than 1 hour daily and only half of HS exercised regularly.

CA skipped few meals and everyone ate dinner. More than half of HA ate three meals/day regularly; almost all HA ate lunch and dinner and most ate breakfast. In contrast, less than one third of CS and only one HS ate three meals regularly. Compared to non-athletes, athletes ate cafeteria foods more often.

Both college and high school athletes practiced every weekday (except on game days), and the timing of meals reflected their practice times. CA had breakfast after their first practice, a snack right before and dinner right after their second practice. CA also snacked throughout the day; most had a snack before lunch and almost all after dinner. HA had one practice that lasted until early evening and usually had a snack before practice and dinner afterwards. Frequently, HA purchased fast food after practice that was eaten at home.

College Employment

Work defined the daily activities of most CS, this group worked more than any other group; 20 of 26 CS held jobs and half worked at least 20 hours each week. Frequently they had more than one job. In contrast, few high school students and CA and only one third of NS had jobs and those who had jobs worked few hours (Table 1).

CS often left home early and did not return until late in the evening. Only one third regularly ate three meals a day, often skipping breakfast. Their lunch was usually on campus but dinners varied between campus, at home, and work. One in five ate dinner at work. Also, they frequently ate foods from fast food restaurants, vending machines, or convenience stores before, during, and after work as shown in Table 1.

Non-student Status

Work status somewhat influenced the daily activities of NS (Table 1) but appeared to have little impact on their meal patterns or food choices. The majority exercised regularly; those working more than 20 hours each week exercised less than one hour each day while those who were not working spent about 2 hours a day exercising. Similarly, working NS spent about an hour a day with friends, those without jobs spent close to 6 hours each day visiting friends, job hunting, doing odd jobs, participating in employment training, or helping family members. Six of seven smokers were NS who were not working. One in five NS ate three meals a day regularly; only HS ate fewer meals. All breakfasts and most dinners were eaten at home but lunch and snacks were fast food and convenience store items.

School as a Food Source

Three meals each day were available to college students. Lunch was the only meal that high school students ate in the cafeteria; only two HS mentioned eating school breakfast. HS used the cafeteria less than HA for two reasons: they frequently purchased fast food for lunch or skipped lunch all together. Aside from two notable differences, food choices from high school cafeterias and fast food restaurants were remarkably similar: pizza, hamburgers, fried chicken nuggets, and French fries. First, while the cafeteria beverage choice of HA was flavored milk, HS beverages were soft drinks or fruit drinks. Interestingly, HA was the only group who drank milk at a meal. Second, several high school students mentioned having a vegetable or a salad as a side dish obtained from the cafeteria.

College students made similar food choices on and off campus with a few exceptions. Regardless of whether they ate breakfast at home or in the cafeteria, CS ate sweetened cereal and milk or breakfast bars, and CA ate bacon, eggs, and grits. Whole fruit was mentioned by

less than one third of college students, but only for meals eaten in the cafeteria. Regardless of location, CS ate fast food-like options at lunch and dinner. A vegetable or a salad was included if they ate in the cafeteria. For lunch, CA ate similar items (fast food-like options) as CS, although many also chose cold sandwiches and grilled chicken. For dinner, CA dinner choices differed from those of CS. Whether at home or cafeteria, CA reported eating grilled or fried meat or fish, a vegetable side dish and sometimes a starch, such as rice, potatoes, macaroni and cheese, or bread.

Eating Dinners at Home

With the exception of CS, weekday dinners were home-based meals regardless of whether the young man lived with family or friends (fewer than half of CS ate dinner at home). Food choices for those eating at home were similar for all groups. Meat choices included baked, grilled or fried chicken, fish, steak, roast beef, or pork. There were salad and vegetable dishes and other side items such as rice, mashed potatoes, macaroni and cheese, and bread. CA often ate pasta with meat or cheese sauce. The CS, who infrequently ate at home, were the least likely to have a meal which included a meat or pasta dish, a vegetable or salad, and a side dish. Only one of five CS ate this type of meal (and only if they ate in the cafeteria) compared to half of HA and NS and three quarters of CA and HS. Regardless of where they ate, CS selected fast food-like items and HA and NS frequently brought fast food home for dinner.

Discussion

This study provides a unique perspective on the meal patterns and food choices of young African-American males. Athletes, especially those in college, timed their meals with their workout schedules which appeared to increase the regularity of meals, the frequency of snacks, and the use of the cafeteria as a source of food for some meals. To our knowledge, we are first to report on differences in eating habits between young African-American males who are or are not on a sports team. While sports participation defined the daily activities of college athletes, work consumed much of an employed college students' weekdays and created an "eat on the run" approach to meal planning, an approach shared with young men not in school who, regardless of work status, relied exclusively on food sources that had few healthful options between breakfast and dinner. "Eating on the run" has been associated with increased consumption of sugar and fat and decreased intake of healthful foods (28). Quick and affordable meals were integral to the diets of these young men (29). Cafeteria foods offered students the option to eat vegetables or fruit and to drink flavored milk. This is consistent with reports among children which show that low socioeconomic status children consume over half of their daily fruit and vegetable intake in school (30). However, many participants ate snack foods and fast food both on and off-campus which is supported by reports regarding the purchase of high calorie beverages and snacks in elementary and middle schools which later become the foods and beverages which are a staple of dorm life (31–33). Dinner was the meal eaten regularly by all groups and, when eaten at home with family or roommates, was an important source of a balanced meal (meat, vegetables, pasta or rice). This confirms the finding among a large sample of young adults that showed a positive association between regularly eating dinner with others, meal regularity, and fruit and vegetable consumption (28).

The Dietary Approach to Stop Hypertension (DASH) diet (increased fruits and vegetables; whole grains; low fat dairy foods; lean meat, fish and poultry; nuts, seeds, and legumes; and limited fats, sweets, and sodium) has been shown to lower BP, particularly among African-Americans (7). Our results confirm other reports that young African-American males at risk for HTN do not exhibit eating patterns consistent with DASH recommendations (34–42).

Our participants rarely or never mentioned eating whole grain foods, nuts, seeds, or legumes. Selection of vegetables, fruit or dairy, was limited to cafeterias or home.

This contextual view of eating habits suggests opportunities for designing interventions tailored to young African-American males (43). For example, athletes spent two or more hours each day with coaches and trainers, and there is evidence that these individuals could play an active role in dietary interventions (44,45). There are many reports of promoting healthy food choices in elementary or middle school cafeterias, and these approaches should be extended to high school settings (46,47). However, there are few college-based efforts. Point-of-purchase materials in college cafeterias were shown to increase dairy, fruit, and vegetable consumption (48); but a more tailored strategy is required to reach young men who do not regularly eat in the cafeteria (43). For instance, a combination of motivational interviewing, e-mail based reminders and printed stage-based newsletters increased fruit and vegetable consumption among college students (49). Cell phones and smartphones were central to our communication with participants; emerging digital technology could help young males with known HTN risk factors make better food choice decisions (including at the point of purchase) or monitor their meal or snack frequency (50–52). For those living on their own, interventions could include guidance on making healthier choices when buying foods to prepare for dinner and ready-to-eat foods for home or “eating on the run” (53,54). Our results also suggest that family-based interventions are relevant for adolescents and young adults living with parents or other family members (18,55). Finally, our experience suggests that reaching young males who are not in school requires a community-based strategy which includes community organizations, such as Young Men Christian Association (YMCA), where this group regularly exercises (56) [ENREF 54](#) [ENREF 54](#).

Limitations

This study has some limitations. This was a purposive sample and it is not known how the meal patterns of these participants would compare to a population-based sample. The relationship between the meal patterns found here, dietary intake, and BP requires further research. There is also a need to explore how culture, religion, and views about healthy eating influence food choices and to understand more about the food acquisition and preparation practices in order to identify opportunities for tailoring future interventions.

Conclusions

Dietary approaches to improve eating behaviors related to hypertension among young African-American males must be combined with innovative strategies to promote healthy exercise practices and blood pressure monitoring and increase knowledge of the prevention and treatment of hypertension (41). These results move beyond the distinctions of race and gender to help understand the complexity of the lives of young African-American males and provide a starting point for developing new ways to help them achieve and maintain healthful eating patterns.

References

1. Berenson G, Srinivasan S, Chen W, Li S, Patel D. Racial (black-white) contrasts of risk for hypertensive disease in youth have implications for preventive care: the Bogalusa Heart Study. *Ethn Dis.* 2006; 16 suppl 4(3):S4-2, S4-9. [PubMed: 16937775]
2. Berenson GS, Cresanta JL, Webber LS. High blood pressure in the young. *Annu Rev Med.* 1984; 35:535–560. [PubMed: 6372671]
3. McNiece KL, Poffenbarger TS, Turner JL, Franco KD, Sorof JM, Portman RJ. Prevalence of hypertension and pre-hypertension among adolescents. *J Pediatr.* 2007; 150(6):640–644. [PubMed: 17517252]

4. Appel LJ, Champagne CM, Harsha DW, Cooper LS, Obarzanek E, Elmer PJ, Stevens VJ, Vollmer WM, Lin PH, Svetkey LP, Stedman SW, Young DR. Effects of comprehensive lifestyle modification on blood pressure control: main results of the PREMIER clinical trial. *JAMA*. 2003; 289(16):2083–2093. [PubMed: 12709466]
5. Appel LJ, Giles TD, Black HR, Weber MA. ASH Position Paper: Dietary approaches to lower blood pressure. *J Clin Hypertens*. 2009; 11(7):358–368.
6. Bray GA, Vollmer WM, Sacks FM, Obarzanek E, Svetkey LP, Appel LJ. A further subgroup analysis of the effects of the DASH diet and three dietary sodium levels on blood pressure: results of the DASH-Sodium Trial. *Am J Cardiol*. 2004; 94(2):222–227. [PubMed: 15246908]
7. Sacks FM, Svetkey LP, Vollmer WM, Appel LJ, Bray GA, Harsha D, Obarzanek E, Conlin PR, Miller ER, Simons-Morton DG, Karanja N, Lin PH. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. DASH-Sodium Collaborative Research Group. *N Engl J Med*. 2001; 344(1):3–10. [PubMed: 11136953]
8. Svetkey LP, Erlinger TP, Vollmer WM, Feldstein A, Cooper LS, Appel LJ, Ard JD, Elmer PJ, Harsha D, Stevens VJ. Effect of lifestyle modifications on blood pressure by race, sex, hypertension status, and age. *J Hum Hypertens*. 2005; 19(1):21–31. [PubMed: 15385946]
9. Allen N. Racial/ethnic differences in stroke in young adults. *Neuroepidemiology*. 2009; 32(4):312. [PubMed: 19287185]
10. Demory-Luce D, Morales M, Nicklas T, Baranowski T, Zakeri I, Berenson G. Changes in food group consumption patterns from childhood to young adulthood: the Bogalusa Heart Study. *J Am Diet Assoc*. 2004; 104(11):1684–1691. [PubMed: 15499355]
11. Deshmukh-Taskar P, Nicklas TA, Yang SJ, Berenson GS. Does food group consumption vary by differences in socioeconomic, demographic, and lifestyle factors in young adults? The Bogalusa Heart Study. *J Am Diet Assoc*. 2007; 107(2):223–234. [PubMed: 17258958]
12. Din-Dzietham R, Liu Y, Bielo MV, Shamsa F. High blood pressure trends in children and adolescents in national surveys, 1963 to 2002. *Circulation*. 2007; 116(13):1488–1496. [PubMed: 17846287]
13. Flint TBA, Quandt S, Savoca MR. Variations in meal patterns of young African American Adults are associated with their hypertension risk profiles. *Ann Behav Med*. 2008; 35 suppl:D109.
14. Savoca MR, Quandt SA, Evans CD, Flint TL, Bradfield AG, Morton TB, Harshfield GA, Ludwig DA. Views of hypertension among young African Americans who vary in their risk of developing hypertension. *Ethn Dis*. 2009; 19(1):28–34. [PubMed: 19341160]
15. Bryant LL, Chin NP, Cottrell LA, Duckles JM, Fernandez ID, Garces DM, Keyserling TC, McMillin CR, Peters KE, Samuel-Hodge CD, Tu SP, Vu MB, Fitzpatrick AL. Perceptions of cardiovascular health in underserved communities. *Prev Chronic Dis*. 2010 Mar.7(2):A30. [PubMed: 20158958]
16. Elder, GH, Jr. Perspectives on life course. Ithaca: Cornell University Press; 1985.
17. Matthews KA, Kiefe CI, Lewis CE, Liu K, Sidney S, Yunis C. Socioeconomic trajectories and incident hypertension in a biracial cohort of young adults. *Hypertension*. 2002; 39(3):772–776. [PubMed: 11897761]
18. Nelson Laska M, Larson NI, Neumark-Sztainer D, Story M. Dietary patterns and home food availability during emerging adulthood: do they differ by living situation? *Public Health Nutr*. 2010; 13(2):222–228. [PubMed: 19691902]
19. Nelson MC, Larson NI, Barr-Anderson D, Neumark-Sztainer D, Story M. Disparities in dietary intake, meal patterning, and home food environments among young adult nonstudents and 2- and 4-year college students. *Am J Public Health*. 2009; 99(7):1216–1219. [PubMed: 19443824]
20. Story M, Neumark-Sztainer D, French S. Individual and environmental influences on adolescent eating behaviors. *J Am Diet Assoc*. 2002; 102 Suppl(3):S40–S51. [PubMed: 11902388]
21. Gielen, AC.; McDonald, EM.; Gary, TL.; Bone, LR. Using thePrecede-Proceed Model to apply health behaviors to theories. In: Glanz, K.; Rimer, B.; Viswanath, K., editors. *Health Behavior and Health Education*. 4th ed.. San Francisco CA: Jossey-Bass; 2008. p. 407-433.
22. Resnicow, K.; Braithwaite, R.; Dilorio, C.; Glanz, K. Applying theory to culturally diverse and unique populations. In: Glanz, K.; Rimer, B.; Lewis, F., editors. *Health Behavior and Healthy Education: Theory, Research, and Practice*. 3rd ed.. San Francisco: Jossey-Bass; 2002. p. 485-509.

23. Arcury TA, Quandt SA. Qualitative methods in arthritis research: sampling and data analysis. *Arthritis Care Res.* 1998; 11(1):66–74. [PubMed: 9534496]
24. Britten N. Qualitative interviews in medical research. *BMJ.* 1995 Jul 22; 311(6999):251–253. [PubMed: 7627048]
25. Barbour RS. Checklists for improving rigour in qualitative research: a case of the tail wagging the dog? *BMJ.* 2001; 322(7294):1115–1117. [PubMed: 11337448]
26. Harris JE, Gleason PM, Sheean PM, Boushey C, Beto JA, Bruemmer B. An introduction to qualitative research for food and nutrition professionals. *J Am Diet Assoc.* 2009; 109(1):80–90. [PubMed: 19103326]
27. Miles, MB.; Huberman, AM. *Qualitative data analysis: an expanded source book.* 2nd ed.. Thousand Oaks: Sage Publications; 1994.
28. Larson NI, Nelson MC, Neumark-Sztainer D, Story M, Hannan PJ. Making time for meals: meal structure and associations with dietary intake in young adults. *J Am Diet Assoc.* 2009; 109(1):72–79. [PubMed: 19103325]
29. Neumark-Sztainer D, Story M, Perry C, Casey MA. Factors influencing food choices of adolescents: findings from focus-group discussions with adolescents. *J Am Diet Assoc.* 1999; 99(8):929–937. [PubMed: 10450307]
30. Robinson-O'Brien R, Burgess-Champoux T, Haines J, Hannan PJ, Neumark-Sztainer D. Associations between school meals offered through the National School Lunch Program and the School Breakfast Program and fruit and vegetable intake among ethnically diverse, low-income children. *J Sch Health.* 2010; 80(10):487–492. [PubMed: 20840658]
31. Nelson MC, Story M. Food environments in university dorms: 20,000 calories per dorm room and counting. *Am J Prev Med.* 2009; 36(6):523–526. [PubMed: 19356889]
32. Park S, Sappenfield WM, Huang Y, Sherry B, Bensyl DM. The impact of the availability of school vending machines on eating behavior during lunch: the Youth Physical Activity and Nutrition Survey. *J Am Diet Assoc.* 2010; 110(10):1532–1536. [PubMed: 20869493]
33. Turner L, Chaloupka FJ. Wide availability of high-calorie beverages in US elementary schools. *Arch Pediatr Adolesc Med.* 2010; E1:6.
34. Falkner B, Sherif K, Michel S, Kushner H. Dietary nutrients and blood pressure in urban minority adolescents at risk for hypertension. *Arch Pediatr Adolesc Med.* 2000; 154(9):918–922. [PubMed: 10980796]
35. Larson NI, Neumark-Sztainer D, Harnack L, Wall M, Story M, Eisenberg ME. Calcium and dairy intake: Longitudinal trends during the transition to young adulthood and correlates of calcium intake. *J Nutr Educ Behav.* 2009; 41(4):254–260. [PubMed: 19508930]
36. Larson NI, Neumark-Sztainer D, Story M, Burgess-Champoux T. Whole-grain intake correlates among adolescents and young adults: findings from Project EAT. *J Am Diet Assoc.* 2010; 110(2): 230–237. [PubMed: 20102850]
37. Nelson MC, Neumark-Sztainer D, Hannan PJ, Story M. Five-year longitudinal and secular shifts in adolescent beverage intake: findings from project EAT (Eating Among Teens)-II. *J Am Diet Assoc.* 2009; 109(2):308–312. [PubMed: 19167959]
38. Nguyen S, Choi HK, Lustig RH, Hsu CY. Sugar-sweetened beverages, serum uric acid, and blood pressure in adolescents. *J Pediatr.* 2009; 154(6):807–813. [PubMed: 19375714]
39. Piernas C, Popkin BM. Trends in snacking among U.S. children. *Health Aff.* 2010; 29(3):398–404.
40. Sebastian RS, Cleveland LE, Goldman JD. Effect of snacking frequency on adolescents' dietary intakes and meeting national recommendations. *J Adolesc Health.* 2008; 42(5):503–511. [PubMed: 18407046]
41. Sebastian RS, Wilkinson Enns C, Goldman JD. US adolescents and MyPyramid: associations between fast-food consumption and lower likelihood of meeting recommendations. *J Am Diet Assoc.* 2009; 109(2):226–235. [PubMed: 19167949]
42. Wang Y, Jahns L, Tussing-Humphreys L, Xie B, Rockett H, Liang H, Johnson L. Dietary intake patterns of low-income urban African-American adolescents. *J Am Diet Assoc.* 2010; 110:1340–1345. [PubMed: 20800126]
43. Kreuter MW, Skinner CS. Tailoring: what's in a name? *Health Educ Res.* 2000; 15(1):1–4. [PubMed: 10788196]

44. Dunn MS, Eddy JM, Wang MQ, Nagy S, Perko MA, Bartee RT. The influence of significant others on attitudes, subjective norms and intentions regarding dietary supplement use among adolescent athletes. *Adolescence*. 2001; 36(143):583–591. [PubMed: 11817638]
45. King KA, Dowdall MP, Wagner DI. Coaches' attitudes and involvement in alcohol prevention among high school athletes. *J Community Health*. 2010; 35(1):68–75. [PubMed: 19838775]
46. Cullen KW, Eagan J, Baranowski T, Owens E, de Moor C. Effect of a la carte and snack bar foods at school on children's lunchtime intake of fruits and vegetables. *J Am Diet Assoc*. 2000; 100(12):1482–1486. [PubMed: 11138440]
47. Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K. Creating healthy food and eating environments: policy and environmental approaches. *Annu Rev Public Health*. 2008; 29:253–272. [PubMed: 18031223]
48. Buscher LA, Martin KA, Crocker S. Point-of-purchase messages framed in terms of cost, convenience, taste, and energy improve healthful snack selection in a college foodservice setting. *J Am Diet Assoc*. 2001; 101(8):909–913. [PubMed: 11501865]
49. Richards A, Kattelman KK, Ren C. Motivating 18- to 24-year-olds to increase their fruit and vegetable consumption. *J Am Diet Assoc*. 2006; 106(9):1405–1411. [PubMed: 16963345]
50. Connor MJ. Missing elements revisited: information engineering for managing quality of care for patients with diabetes. *J Diabetes Sci Technol*. 2010; 4(5):1276–1283. [PubMed: 20920451]
51. Junco R, Merson D, Salter DW. The effect of gender, ethnicity, and income on college students' use of communication technologies. *Cyberpsychol Behav Soc Netw*. 2010; 13(6):619–627. [PubMed: 21142986]
52. Schuerenberg BK. Smart phones finding voice in health care. Though adoption still is low, new health care applications are evolving for the converged devices. *Health Data Manag*. 2006; 14(2):64, 66, 68 passim. [PubMed: 16594501]
53. Neumark-Sztainer D, Hannan PJ, Story M, Croll J, Perry C. Family meal patterns: associations with sociodemographic characteristics and improved dietary intake among adolescents. *J Am Diet Assoc*. 2003; 103(3):317–322. [PubMed: 12616252]
54. Rollins B, Belue R, Francis L. The beneficial effect of a family meal on obesity differs by race, sex and household education: the national survey of children's health, 2003–2004. *J Am Diet Assoc*. 2010; 110:1335–1339. [PubMed: 20800125]
55. Nelson MC, Story M, Larson NI, Neumark-Sztainer D, Lytle LA. Emerging adulthood and college-aged youth: an overlooked age for weight-related behavior change. *Obesity*. 2008; 16(10):2205–2211. [PubMed: 18719665]
56. Griffith DM, Allen JO, DeLoney EH, Robinson K, Lewis EY, Campbell B, Morrel-Samuels S, Sparks A, Zimmerman MA, Reischl T. Community-based organizational capacity building as a strategy to reduce racial health disparities. *J Prim Prev*. 2010; 31(1–2):31–39. [PubMed: 20127281]

Figure 1.
Weekday Activities, meal patterns, and typical food choices and food sources of young African-American males

Figure 2.
Weekday activities, meal patterns, and typical food choices and sources of foods of African-American male high school students

Characteristics and meal patterns of young African-American men 15–22 years who participated in meal pattern timeline interviews (n=106)

Table 1

Variables	High School Students			College Students		Non-Students	
	Not a Sports Team Member (HS)	Sports Team Member (HA)	Not a Sports Team Member (CS)	Sports Team Member (CA)	(NS)		
n (%)	13 (12.3)	27 (25.5)	26 (24.5)	16 (15.1)	24 (22.6)		
Age (mean ± SD)	17.5 ± 0.87	16.5 ± 1.1	20.5 ± 1.1	21.0 ± 1.0	21.1 ± 1.7		
BMI (mean ± SD)	26.0 ± 5.8	25.1 ± 4.4	26.2 ± 5.7	27.0 ± 3.9	25.4 ± 4.6		
Currently working (n [%])	5 (38.5)	6 (22.2)	20 (76.9)	4 (25.0)	9 (37.5)		
Working >20hr/wk (n [% of working])	1 (20.0)	2 (33.3)	10 (50.0)	1 (25.0)	5 (55.6)		
Sleeps <8 hrs/day (n [%])	9 (69.2)	10 (37.0)	19 (73.0)	9 (56.3)	10 (41.7)		
Active in sports or exercise (n [%])	7 (53.8)	27 (100)	19 (73.1)	13 (100)	21 (87.5)		
Smokes at least 4 cigarettes/day	2 (15.3)	0 (0)	0 (0)	0 (0)	7 (29.3)		
Hours spent each day (mean ± SD)							
Asleep	7.6 ± 1.5	8.1 ± 1.1	7.0 ± 2.0	7.3 ± 1.8	8.3 ± 1.4		
In team practice or exercise	1.07 ± 1.3	2.2 ± 1.5	0.82 ± 1.3	2.7 ± 1.3	1.4 ± 3.0		
In other locations	0.63 ± 1.1	0.87 ± 1.4	1.7 ± 2.9	1.5 ± 2.4	4.0 ± 4.7		
At home	7.2 ± 2.6	5.6 ± 2.4	7.4 ± 3.7	7.9 ± 2.7	7.9 ± 3.9		
At school or on campus	6.4 ± 1.6	7.1 ± 0.7	4.5 ± 2.7	4.0 ± 1.2	NA		
At work	1.0 ± 2.4	.05 ± 0.3	2.7 ± 3.3	0.1 ± 0.5	2.5 ± 3.6		
Regularly (3–5 weekdays) eats breakfast (n [%])	2 (15.4)	17 (67.0)	15 (57.7)	13 (81.3)	12 (50)		
Regularly (3–5 weekdays) eats lunch (n [%])	2 (15.4)	23 (85.2)	23 (88.5)	13 (81.3)	11 (4)		
Regularly (3–5 weekdays) eats dinner (n [%])	11 (84.6)	24 (88.9)	24 (92.3)	16 (100)	18 (75.0)		
Regularly eats three meals/day (n [%])	1 (7.7)	15 (55.6)	8 (30.8)	11 (68.8)	5 (20.8)		
Number of snacks (mean ± SD)	2.6 ± 1.0	2.3 ± 1.3	2.0 ± 1.3	3.3 ± 1.6	2.4 ± 1.5		
Always or sometimes takes a daily vitamin (n [%])	2 (16.7)	2 (7.4)	4 (25.0)	7 (42.7)	4 (16.7)		