



A Qualitative Investigation of College Student Perceptions of Their Nutrition Environment: Recommendations for Improvement

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ABSTRACT

Background: College is the first environment in which students are responsible for making all decisions relating to their eating and exercise behaviors. Of all contributing factors to overweight and obesity, one main influence seems to be the environment. **Purpose:** This study explored college students' perceptions of their nutrition environment on campus. **Methods:** A convenience sample of 33 undergraduate college students (15 males, 18 females) participated in focus groups and key informant interviews on topics related to the college nutrition environment. **Results:** Major themes included accessibility, money, food, education, and student opinions. Students indicated that unhealthy, processed foods are more available than healthy foods on campus. They also brought up many barriers for eating healthy on campus. **Discussion:** The accessibility of healthy foods was a major barrier brought up by participants. This barrier included issues with ongoing construction limiting access to food locations, lack of locations for healthy foods, lack of a market-type store, time, and a plethora of vending machines. Elimination of these barriers would help to improve the campus' overall nutrition environment. **Translation to Health Education Practice:** Health Educators should work with college personnel to develop policies and practices that promote healthy eating and prevent college weight gain.

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Background

Recent data estimate that two-thirds of U.S. adults aged 20 years and older are overweight and 35.7% are obese, a rate that has doubled since 1980¹ The transition period from high school to college represents challenges adjusting to new environments and workloads, changes to sleep, activity, and eating patterns, and more freedom; all which can contribute to college weight gain. Excess weight, along with increases in body mass index, can put college students at risk for chronic diseases that if not prevented, may remain with them through the transition to adulthood and beyond. These chronic diseases, mainly caused by the combination or poor dietary intake and physical inactivity, include obesity, heart disease, type II diabetes, and mental health conditions, such as depression.² Of all the contributing factors to overweight and obesity, one of the main influences seems to be the environment.³ Researchers studying college students over the past 10 years have demonstrated that a majority of students gain weight in their college years and call for programs to be developed aimed at prevention.^{3,4}

A growing body of research suggests that there is a strong influence of physical and social surroundings on the decision-making process which can impact health. Some research suggests that college dining environments are obesogenic, meaning environmentally contributing to college weight gain.⁴ This research suggests that altering environments may be an effective driver of behavior change. Environmental components may include food advertising, accessibility and affordability of foods, food portions, and the demands of juggling work and class schedules.³ Some research suggests that these environments may be promoting an unhealthy lifestyle,⁵ due to unhealthy food advertisements, buffet-style dining halls, the availability and accessibility of calorie-rich and nutrient-poor food, and lack of adequate and safe recreational places for physical activity.⁶ Additionally, students are spending more time in front of their computers doing schoolwork and less time being physically active.⁷

Understanding the physical and socio-environmental interactions toward food on a college campus can help health professionals develop more effective interventions and policies that support healthier nutrition among college students. Since individual behaviors to make healthy

Table 1. Ecological framework illustrating multiple influences on what people eat.

Individual Influences	Knowledge, attitudes, preferences, skills, biology, behavior
Interpersonal Influences	Family, friends, peer groups, social networks
Organizational Influences	Policies, practices and social norms of the organization in which people belong to
Community Influences	Relationships between community organizations, institutions, neighborhoods, and networks
Societal Influences	Social norms, structures, policies, and systems (local, state, and national) that may affect communities, organizations, and individual health

food choices can only occur in a supportive environment, an ecological approach, such as the social-ecological model (SEM) has been proven useful to guide various types of health intervention efforts, especially those on college campuses.^{8,9} The SEM illustrates the connections between people and their environments,¹⁰ by focusing on the reciprocal influences at five levels of influence. The innermost level is the intrapersonal layer, which includes individual characteristics. The second level is the interpersonal level, which includes social networks and relationships. The third level is the organizational level of influence, which includes policies and practices of the organization. The community level includes relationships among organizations and neighborhoods. Lastly, the societal level includes local, state and national policies. See [Table 1](#) for examples of the possible SEM influences on what people eat.¹⁰

What is unclear from the limited research available regarding the college environment and dietary behaviors is what environmental components students believe influence their eating and purchasing habits, including identification of barriers and facilitators for healthy and unhealthy nutrition behaviors. Researchers utilized the SEM model as a framework to examine the various ecological influences of food and dietary behaviors. Identifying factors that prevent college students from eating healthier foods would allow strategies to be developed to remove barriers. Further research exploring college nutrition environments is needed so targeted interventions can be implemented and evaluated in these settings.^{11–13}

Purpose

The purpose of this qualitative study was to explore college students' perceptions of the college nutrition environment and the availability, accessibility, and barriers to healthy eating on campus through a SEM lens. The following research questions guided the study: (1) How do students feel about the availability and accessibility of healthy foods on campus?; (2) What are college students' perceptions of healthy food on campus?; and (3) What are the barriers for healthy eating on campus? After identifying the barriers to healthy eating, researchers will utilize the ecological model as a framework to explore multi-level strategies to improve healthy eating that could help mitigate college weight gain.

Methods

Study setting

The college campus setting for this study was an urban, southern university comprised of approximately 21,000 students. For purposes of this study, the "college nutrition environment" was defined as the physical and psychological environments which may influence food consumption and purchasing habits of students. In this setting, campus regulations required that all full-time students living on campus purchase one of the meal plan options from campus dining services. Although not a requirement, many off-campus students also purchase a meal plan, as they tend to stay on campus during the day and purchase foods between classes. Part of the meal plan package includes dining dollars, which is a declining balance account that may be used for food purchases at all dining designations on and near campus; this includes over 14 locations.

Participants and recruitment

Thirty-three students were recruited for this study; 28 participated in focus groups, and 5 gave key informant interviews. A non-probability convenience sample was used for this study. Participants were recruited through several methods including on-campus flyers, posters, and ads in the campus newspaper and student e-mail. Students were pre-screened before being enrolled in the study to meet inclusion criteria of age, enrollment and year in school. Key informant interviews were conducted after focus groups to have a better in-depth understanding of key topics.

Procedures

The study protocol was submitted to the Institutional Review Board (IRB) at the university and approved prior to start of study. All focus groups were stratified based on class level and gender. During the focus group sessions and key informant interviews, participants were asked a series of open-ended questions. After a comprehensive literature review and expert interview, topic areas were selected for concentration in the focus groups. These questions were designed to explore specific systems embedded within the

SEM that are relevant to the campus nutrition environment. Individual influences explored attitudes, food preferences and behaviors; interpersonal influences included friends, family and social networks; organizational influences included policies and practices of the institution related to food; and lastly, community/societal influences explored food availability in the community surrounding the institution. Focus group questions were open-ended to spark participant discussion. Focus group inquiry items included: (a) nutrition environments; (b) healthy eating environment; (c) promotion of a healthy eating environment; (d) experience on campus; (e) availability/accessibility of healthy foods; (f) barriers to healthy eating on campus; (g) nutrition information received on campus; and (h) wanted changes to the nutrition environment on campus. In order to clarify wording of questions, a pilot focus group was conducted. Focus group questions were adjusted as appropriate.

Data analysis

Grounded theory was used to guide the analysis of qualitative data. The use of grounded theory allowed for participant perspectives to emerge without the bias of an established theory influencing the emerging themes. All focus group and key informant interviews were audio recorded and then transcribed verbatim. While reviewing transcripts, coding categories were developed and each category was assigned a number between 1 and 6. For initial coding, focus group and key informant questions were printed and taped on a large poster board and each focus group session transcript and key informant interview was printed on different color paper. Then, each piece of text was cut out, labeled with a coding category (number), and taped onto the poster that corresponded with the question. It is important to note that not all pieces of text were mutually exclusive and could be coded with more than one category. Relationships between categories and questions as well as special vocabulary used were noted during the coding process.

After initial coding was complete, focused coding began. For this study, focused coding was done to help eliminate or combine category codes and to look for emerging themes and subthemes. After identification of all themes and subthemes, validity of account and trustworthiness was established through the utilization of member checking. Preliminary findings were summarized and sent to all participants. After responses were reviewed, all identified themes were endorsed by respondents. Triangulation of data was done by conducting multiple focus groups, surveys and interviews.

Results

Of the 33 participants, 42% were sophomores, 31% juniors, and 27% seniors. On the demographic questionnaire, participants were asked to give their height and weight. From reported heights and weights, BMIs were calculated. The average BMI of all participants was 27, which is considered overweight, and is believed to carry moderate health risks. A majority of participants (60.1%) lived off campus, while 39.9% lived on campus. In terms of race/ethnicity, 42.4% self-reported as African American, 36.4% Caucasian, 9.1% Asian, 6.1% Hispanic, 3% Pacific Islander and 3% did not report.

Table 2 depicts eating and purchasing habits on campus. The majority of participants had dining dollars to use for on-campus food purchasing, but only 42% had meal plans. The median score for weekly visits to the dining halls was 2.5 and the median weekly visits to campus restaurants was three. On a scale of 1–5, with 5 being the healthiest and 1 being the least healthy, most participants' rated their eating habits as "unhealthy". Additionally, they reported eating two servings of fruits and vegetables per day.

Analysis of focus group interviews and key informant interviews revealed five major themes: (1) Accessibility of Healthy Foods, (2) Money/Budget, (3) Food Options, (4) Education, and (5) Lack of Student Input. Along with these themes, several subthemes were revealed which represented both the positive and nega-

Table 2. Summary of eating and purchasing habits.

Variable	f (%)	Mean	Median	Range
BMI		27		
Dining Dollars	32 (97)			0–225
Meal Plans	14 (42)			0–12
Weekly Visits to Dining Hall			2.5	0–12
Weekly Visits to UAB Campus Restaurant			3	0–8
Daily Servings of Fruits and Vegetables			2	1–8
Rating of Eating Habits at UAB			2	1–4

Table 3. Major themes and subthemes.

Accessibility	Construction Location Market ^a Time Vending Machines
Money	Dining Dollars/Meal Plans Healthy Foods Overpriced ^a
Food	Advertising Lay-Out Menu Options Taste To-Go
Education	Quality Classes Nutrition Resources UAB Campus Dining Website Recreation Center
Student Input	

^aIndicates this subtheme was only found for focus group perceptions.

tive aspects of students’ perceptions relating to the university nutrition environment (Refer to Table 3).

Accessibility of healthy foods

Overall, the most commonly discussed theme was accessibility of healthy foods on campus, with five sub-themes. A student described this theme as a barrier to healthy food, “I think it is a hassle to go out of your way to be accessible to those (healthy) options.” Table 4 lists selected quotes from each sub-theme for accessibility of healthy foods, which is elaborated on below.

Ongoing construction projects

As is common on an urban campus, there were several construction projects occurring at the time of data collection. As part of this process, the main campus services building, including the main dining facility, was torn down to build a more updated building. This was concerning to the vast majority of participants, as it eliminated a common place for gathering.

Poor locations/inconvenient

The students believed locations where healthy food was available were not centrally located and convenience was a factor in facilitating unhealthy food choices. When asked about the barriers of healthy eating, a student responded, “Yeah, convenience. So, for the center of campus is unhealthy.” Students discussed that by adding a new, centrally located food option that had healthy choices, some of the issues of accessibility could be addressed.

Lack of market/grocery

The topic of an on-campus marketplace and the lack thereof was brought up in several focus groups. The comments were that the campus does not have any type of grocery store or market on campus and therefore many students felt this did not let allow them to choose healthy produce. Participants recommended any type (e.g. farmer’s market, to-go market, grocery store) of market which would allow them to purchase on-the-go options and options to cook in their dorm room. Other students specifically mentioned adding a farmer’s market on campus.

Time to access healthy foods

One major barrier to healthy eating that appeared in each focus group was the amount of time it took to access healthy foods on campus. Since many students do not have the time to wait in line for healthy foods, they must settle for unhealthy choices, like the food trucks and vending machines. At this campus, food trucks come in from the greater surrounding area and are essentially restaurants on wheels, with most offering an array of fried foods. One student said eating from the donut truck for breakfast was easier than going to the commons and waiting in line for breakfast, especially with the off-chance there wouldn’t be anything healthy to eat.

Too much vending

Participant’s revealed mostly negative comments related to campus vending. Most seemed to believe having “junk” foods readily available was too tempting. A student described that given the choice between having to walk to the main dining facility to get a healthy snack and having quick access to an unhealthy snack, the unhealthy snack would most often be chosen.

Money/budget

It was a common occurrence that when asked “What are barriers to healthy eating on campus”, students responded with an answer that was financially related. To this question, one student responded, “I feel like the biggest barrier is cost.” See Table 5 for selected quotes relating to money. The following two sub-themes were described related to money/budget.

Table 4. Selected quotes relating to accessibility of healthy foods.

Subtheme	Selected quotations
Construction	“And that’s where I think they made a mistake ... if you’re going to close down the main hub where students get their food, you should have thought about the options before you decided to shut it down.”
Location	“It’s not very accessible to most students unless you are, like a business student or an engineering major, or you just happen to have a calculus class in there.”
Market ^a	“I think something resembling a market would be a really great addition to UAB’s campus. Even if it was just like, a farmer’s market and was seasonal. I think that would be one of the better ways to encourage a better nutritional environment.”
Time	“I think, for students it’s the time- especially if you are going from class to class and don’t have time to sit down and enjoy a meal ... what is available to-go may not be the healthiest. I think that is a barrier.”
Vending Machines	“The vending machines around campus are not healthy either. They are filled with junk food- even the healthy vending machines (which are mislabeled) have junk food.”

^aIndicates this subtheme was only found for focus group perceptions.

Table 5. Selected quotes relating to sub-themes of money/budget theme.

Subtheme	Selected quotations
Dining Dollars/Meal Plans	“ ... produce and stuff isn’t readily available with dining dollars.”
Overpriced ¹	“Price (of healthy foods). That is a barrier for me”

Lack of healthy options using dining dollars/meal plans

A large majority of students seem to be upset with the lack of healthy foods available for purchase with dining dollars or a meal plan. For college students, many buy what is affordable to make their meal plans or dining dollars last. One student responded, “I know universities these days are all business, but you know, if you are going to force a student to have a meal plan or dining dollars, you hold some responsibility of what we are putting into our bodies. Because, if you don’t allow us to have a healthy choice, we can’t make a healthy choice.” Students seemed like they wanted to spend their money on healthful foods.

Healthy foods overpriced

Many students reported that healthy foods were much more expensive than unhealthy options. One student stated, “I feel like there’s not a lot of healthy choices and they are all expensive, so I feel like, ‘What’s the point?’ I can eat so much cheaper somewhere else.” One student described the dilemma, saying, “So, the choices we have on campus are really limited. When students don’t have a big budget for food, we buy cheaper food, which is usually unhealthy. It is harder for us to buy more healthy things when they are expensive.”

Food options

This theme was also a consistent concern of participants. This theme encompasses the actual food options on campus. There were six sub-themes derived from the data and are described further in the following section. See [Table 6](#) for selected quotes relating to food options and subthemes.

Table 6. Selected quotes relating to food options.

Subtheme	Selected quotations
Advertising	“There is not really any advertising for healthy eating options that takes place on campus. In fact, all of the advertising is for unhealthy food choices.”
Lay-Out	“They are going to eat all-you-can eat pizza. So, that really does, like she said, encourage unhealthy eating. And, really binge eating.”
Menu Options	“I enjoy vegetarian food, and there is normally only one option during meal time. And I know that there is not always a vegan option.”
Taste	“Taste is a barrier for me- They need to learn some new recipes or maybe try tasting the food they make before they serve it to the students.”
To-Go	“I wish there was a place on campus to get fresh fruit and health options to go. Maybe a little boutique or vending machine only filled with healthy options.”
Quality	“If it’s not of good quality, I am not going to buy it. I am going to opt for it, but I will go for the less healthy option because it isn’t wilted or old.”

Lack of advertising of healthy options

The advertising of healthy food on campus was brought up many times. When asked what elements of a nutrition environment the university has, one student responded, “Is an example, like them advertising?” It appeared participants were aware of the food advertisements on campus, but the healthy foods were not advertised on campus as much as the unhealthy food choices.

Layout/all-you-can-eat style dining

The overall layout and set-up of on-campus dining halls and restaurants were addressed. Students said the university recently switched to an “all-you-can-eat style” buffet in the main dining hall. There was not one student who reported this type of layout was supportive of a healthy eating environment. In fact, students did not like the way the dining hall was set up. Students felt like the new layout supports overeating. One student stated, “And now, the main dining facility is going to ‘all-you-can-eat’, so the quality goes down, and that encourages students to eat as much as you can, instead of having healthy portion sizes”. Another student stated, “I was so mad about the all-you-can-eat because for breakfast, I would get oatmeal and blueberries, which, you know, is pretty healthy, and a drink and then that was like \$2.60. And I would use my dining dollars for breakfast every morning. And now I can’t do that. It’s either like one whole meal, or like \$7.99 for breakfast from my dining dollars, which is ridiculous. All I want to do is go in for breakfast, use my dining dollars get my oatmeal, and go to class and eat it in class. Which I can’t do.”

Menu options

Students suggested that there were very few options to choose from that were healthy. A major issue students also brought up was the poor selection available at the salad bar. One student talked about adding more options to the salad bar, “And, as far as the salad bar goes, like, have more protein to go with it instead of having just lettuce, and cheese.” Another student suggested, “I remember last year they used to have ham a majority of the time and they would have grilled chicken sometimes and that was actually really good. And I have yet to see that like since that one time last semester. So, that was a bummer.”

Taste

A major subtheme was the way healthy foods tasted, both in general and in comparison to unhealthy food choices. Participants seemed to think that for the most part, the healthy options on campus did not taste good. Students reported this being a major barrier for healthy eating. While discussing the taste of healthy foods on

campus, a participant remarked, “So, you are just sitting there thinking, “This isn’t good. I would rather just be having a burger”.

Lack of healthy to-go options

Participants felt like there are insufficient to-go items, making it nearly impossible to eat healthy on campus. One student commented, “They should have more healthy options on the simply-to-go that look fresher.” Students started to see an emergence of food trucks on campus, “It didn’t really give us much of an alternative other than food trucks – which is unhealthy.” Students agreed that eating from the food trucks is unhealthy, but stated that the need for convenience tended to overshadow eating healthy. Students said they wanted to be able to access healthy foods quickly but the campus environment did not allow them to do so.

Poor quality

One of the major subthemes that arose was the quality of foods on campus. Many students spoke of their dissatisfaction of the quality of healthy foods available on campus. Students felt like the quality of the healthy foods served on campus is not up to their standards. A student spoke on the topic, “There are ways to get great products like vegetables and fruits without resorting to cans, which is what I’m pretty sure they (university foodservice) use for a lot of stuff”.

Education

Interestingly, participants discussed the importance of education related to barriers to healthy eating. Four sub-themes were described related to education and are further described below. Table 7 lists selected quotes for the education theme.

Table 7. Selected quotes relating to education.

Subtheme	Selected quotations
College Classes	“As a student, you are not taught on how to get the proper nutrition. Especially when you’re on your own.”
Nutrition Resources	“I have had to ask or seek out any nutritional information I have received. That is ridiculous. I wish they had an app that you could scan or right next to it so you can see your calories before you buy something”
UAB Campus Dining Website	“I know that on their website, they do put up, like the calories of each serving, but that doesn’t always match what they serve.”
Recreation Center	“They have Wellness Wednesdays and other programs which promote physical activity. I just really enjoy going to the rec center because it has more new equipment. I think that is a positive aspect of the nutrition environment.”

College classes

Most participants agreed that campus classes or workshops would be a great way to educate students about nutrition and healthy eating. They suggested adding classes as part of the core requirement or offering elective classes through the university or recreation center. Another student stated, “I think it would be a great idea to incorporate nutrition and physical activity into the freshman experience class. I think it is something students would want to learn about, too.”

Nutrition resources

Participants reported not receiving any information regarding nutrition content on foods offered on campus and wished this were an option. Students reported no nutritional information was available at the point-of-purchase in the dining halls. Students interested in this information must go online and find the information, which they were unhappy with.

Campus dining website

According to the campus dining services, nutrition content information can be found on the website. However, students reported that the website was difficult to navigate and find information and that the information found often did not match the food options available to students at that time. One student stated, “Supposedly, it is available on the campus dining services website. I remember looking at it once. But, it’s not like one of those things that I can look up on my smartphone. It isn’t like an app or anything like that ... ”

Recreation center

The campus recreation center has many resources that support a healthy lifestyle, including group exercise classes, as well as access to fitness trainers and a registered dietician. Membership to the recreation center is included in tuition, but many students didn’t feel as though this fact was well communicated to students. Students reported that although they appreciated the free group exercise classes, paying extra for a fitness trainer or dietician consult was a barrier. One student said, “I guess the gym does have sessions with the nutritionist and sometimes they have like, I think that one day they have like BMI in the afternoon. Each week they have different things that they want to show. But, I think the one thing that sucks is that you have to pay if you want to go see her privately. Which I think is crazy and that should be included in tuition – there should be some way for us to have that taken care of. I think more people would want to go to that.”

Lack of student input

Finally, participants did not feel like their opinions were wanted in regards to food on campus. They discussed wanting their opinions to be considered when making decisions about the food environment. One student, whose comment seemed to summarize students' feelings on the campus nutrition environment, stated, "I feel like, in a way, it's kind of this dichotomy, because you have the recreation center promoting physical fitness, and you have signs telling you to eat healthily. But it is an obesogenic environment because you have all-you-can-eat, you have Starbucks, you have pastries all in your face. There are so many fried food areas, and this is, again when it comes down to choice and you are trying to go from class to class, it is usually the unhealthy fast food which is going to be the most available."

Discussion

This study used a grounded theory approach to explore student perceptions of the college nutrition environment and the availability, accessibility, and barriers to healthy eating on campus. The results from focus groups and interviews shed new light on the perceived environmental factors that may affect healthy eating and weight gain among this population. Overall, students felt that the current nutrition environment supported unhealthy eating choices and that unhealthy and processed foods were more available and accessible than healthy foods. These findings are supported by previous research,^{11,13,14} which assessed the dining environment and found that campus dining halls provided limited support for good nutrition, and that vending machines provided mostly high fat, salty snacks that were highly processed. The students in this study also reported an over reliance on vending machines because there were no markets/grocery stores on campus offering healthy to-go options. Participants reported the lack of healthy to-go items made it difficult to eat healthy on campus, as the majority of them did not always have the time to sit down and eat a meal. It was also discussed that many of the healthy options on campus were not centrally located, and considered out of the way for many students. These findings, which have been reported in other studies,¹⁴⁻¹⁶ suggest an "obesogenic" food environment, typified by the high availability of energy-dense, nutrient-poor foods, and drinks relative to healthier options, with few healthy vending options.

Students brought up a number of barriers to eating healthy while on campus. For example, students reported that for the most part, the healthier foods did not taste good, were of poor quality and there

were too few options. Many students felt that the all-you-can-eat buffet style layout of the dining hall encouraged students to overeat and take high-fat, processed foods to go, so they felt as though they were getting their monies worth from the meal plan. Consistent with previous studies,¹⁷⁻¹⁹ students felt like the healthy food options were too expensive and were generally overpriced. Tam and colleagues¹⁸ found that the main factors affecting college student food-purchasing choices were taste, value, convenience, and cost. The most commonly recommended changes to the campus food environment were a reduction in price and greater food variety. Reducing the cost of healthy foods has been shown to be a feasible intervention in some studies in improving healthy food consumption behaviors.¹⁶ This could be a reasonable intervention to promote healthier eating among this population. However, most of these changes to promote a healthy nutrition environment on campus would require policy changes, including provision of dining dollars and reduction in prices for healthy items.

What was surprising about the findings from this study, which has largely been absent from previous research, was the overall motivation of students in improving the campus nutrition environment. Many students in this study were motivated to improve the nutrition environment and gave several recommendations for these improvements. These suggestions included creating educational classes for students as part of the core requirements, adding nutrition labeling to all of the foods available on campus, making improvements to the campus dining website and asking for student input before making changes to the campus food environment. A 2011 study found that food labeling on menu items resulted in increased sales of healthy foods over the course of a semester;²⁰ more research is needed to elucidate these findings.

Limitations

This study occurred after demolition of one of the university's main dining halls, which somewhat shifted the dynamics of the nutrition environment, but is important for understanding study results. This could account for some of the frustration with campus dining services.

Translation to Health Education Practice

When planning an intervention, it is beneficial to use an ecological lens to evaluate the campus environment, the campus community, organizations within the campus community, interpersonal factors and individual knowledge, attitudes and skills. The findings from this

qualitative study provide a number of considerations for health education research and practice.

Individual-level recommendations

The individual-level influence includes knowledge, skills, attitudes and beliefs, and demographic variables such as race, gender, culture, and socioeconomic status. A recommendation at the individual level is for the university to actively seek out student, faculty and staff opinions. It is clear that students want to have a say in the food availability and accessibility on campus. Health Educators could gather survey data from students on nutrition-related knowledge, skills, and beliefs. Also, asking questions about food preferences and recommendations for improving the food environment would be important. From this data, targeted interventions could increase knowledge and skills of the campus community. Health Educators could offer college classes on cooking and food preparation techniques, healthy eating strategies, and how to read nutrition labels. Several students suggested that a nutrition week be part of the “Freshman Experience” course that is a requirement of all freshman students. Topics might include: how to meal plan, shop and prepare a healthy meal, how to read nutrition labels and how eat healthy when dining out.

Interpersonal-level recommendations

The interpersonal level includes a person’s closest social circle-peers, partners, family members and social networks-that may influence their behavior and contribute to their range of experiences. Targeting social networks could be done utilizing a health communications campaign to promote awareness of healthy food options on campus. Utilizing social media (twitter, Facebook) to educate the community about nutrition content, how to incorporate more fruits and vegetables and recipe ideas could offer a way to get people talking about nutrition on campus.

Organizational-level recommendation

Changing policies, practices and the environment of an organization can change the social norm of nutrition and health practices on campus. Health educators should work with college administrators and businesses to offer spaces on campus that are adjacent to fresh food stands that provide students with healthy food options while they are interacting with one another. Also, Health Educators could work with campus administration and campus dining services to make changes to policies and practices based upon survey data from students, including reduction in price points

for healthier items and existing contracts with food vendors. Research on marketing healthful foods to college students could elucidate what food products sell best, and when students feel prices are too high. As such, another important area that could improve the nutrition environment is increased advertising and marketing of healthy foods. Future research should focus on which messages are able to reach the target audience best and best methods for dissemination of information.

Another organizational-level recommendation is that campus dining services evaluate the pricing of on-campus foods. By lowering the cost, healthy foods would become more accessible to students. Offering a greater variety of healthy food would target more students, and thus could increase revenue for campus dining. It is recommended to eliminate the all-you-can-eat style buffets that exist on campus in favor of buying based on portion size. It is also recommended to create new menus with a greater variety of healthy foods for students as well as point-of-purchase nutrition labeling.

Community-level recommendations

For the purposes of this study, the “community” is the campus environment consisting of students, faculty and staff, college leaders and administration, local businesses, and the food and beverage industries. To make substantive changes to the community food environment, health educators could facilitate the development of a committee of stakeholders that represent the community, to partner and develop healthy initiatives that support good nutrition. Partnering with local farmers, grocery stores, health-related coalitions are good choices to begin the process of change to bring health awareness to the entire community. Health Educators working on college campuses should plan nutrition interventions using an ecological lens in order to make comprehensive changes to improve the nutritional environment.

Disclosure statement

No potential conflict of interest was reported by the authors.

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