

Qualitative Assessment of Pre-Healthcare Undergraduates' Perceptions of Childhood Obesity to Inform Premedical Curricular Changes¹

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Abstract

Little is known about undergraduates' understanding of complex health issues like childhood obesity. Researchers sought to examine to what degree pre-healthcare undergraduates can identify and describe the complexity of childhood obesity to inform premedical curricular approaches in light of the 2015 changes to the Medical College Admissions Test®. Through this qualitative analysis, researchers determined that pre-healthcare students with nutrition and social science majors and health minors and significant experience with obese people or prevention programs were more knowledgeable about childhood obesity than their counterparts. All students were able to describe many causes of childhood obesity, putting a focus on the child's diet and familial influence. However, they did not describe the complexity of prevention as well, citing mostly programs they had personally seen in practice or had heard about in popular media. Based on these findings, we suggest undergraduate institutions provide students with specialized coursework and service-learning experiences that include exposure to health behavior-related concepts, such as the social ecological model. Because community programs targeting children are often accessible by college students, childhood obesity is a useful context to provide this education, helping students deepen their understanding of health and reflect on their roles as future healthcare providers.

Introduction

In a 2012 open letter to premedical students from the Association of American Medical Colleges, Presi-

dent Darrell Kirch said, "Our profession increasingly recognizes that our current health care model needs to do more to promote prevention and wellness for patients." Therefore, as he noted, "[T]he health care system of tomorrow will require a different kind of doctor." It will require one who understands "how [people] think, interact, and make decisions" (Kirch, 2012). This will be reflected in the 2015 Medical College Admissions Test® (MCAT®), which will shift from an emphasis solely on expertise in the natural and physical sciences, to an assessment of knowledge in the behavioral and social sciences as well (Association of American Medical Colleges, 2012).

The context of the MCAT® has a direct influence on premedical curricula; therefore, as the MCAT® changes, so too will the required or recommended coursework in the behavioral and social sciences (Sklar, 2013). This will require premedical courses that foster an opportunity for meaningful development of the desired skills and dispositions, allowing students to apply discipline-based theories to specific health-related issues in the community and reflect on the role of the healthcare provider in the context of the problem (Gross et al., 2008; Frazer and Twohig, 2012). Because many premedical students pursue majors in the agriculture and life sciences, educators in these fields will be the ones to instigate curricular changes in light of students' current understanding of public health concerns, like obesity. Simply adding an introductory psychology course as a prerequisite, for example, is not likely enough to maximize these newly desired student

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learning outcomes; therefore, undergraduate institutions should consider other ways to integrate the social and behavioral sciences into their premedical curricula (Hilborn et al., 2012).

Childhood obesity is an excellent model for demonstrating the complex interrelationships between the biological and psychosocial determinants of health because of the multifactorial nature of contributors to weight status (Davison and Birch, 2001; Harrison et al., 2011). More specifically, it can be used in premedical curricula to introduce students to theoretical frameworks that describe those complex interrelationships, providing a foundation for considering evidence-based approaches to prevention and treatment within the healthcare system.

Due to the high prevalence of childhood obesity (Ogden and Carroll, 2010), undergraduate institutions can use community programs with which they typically already have established partnerships (e.g. YMCAs) as a vehicle for students to apply this learning in a community setting.

Little is currently known about pre-healthcare undergraduate students' views regarding childhood obesity, the sources of that knowledge, and how it affects their understanding of the disease. In particular, we were interested in examining the question: To what degree can students identify and describe the complexity of childhood obesity? This understanding could provide a baseline of information from which to develop curricular approaches, using childhood obesity as a model to help integrate the social and behavioral sciences into premedical curricula.

Materials and Methods

Participants and Recruitment

We interviewed pre-healthcare undergraduate seniors about the etiology of childhood obesity, employing a qualitative approach to give a “complex and holistic picture” of students' perceptions (Jencik, 2011). We recruited seniors who had completed at least seven semesters of coursework and were planning to apply to or enter professional or graduate school in a health-related discipline, using flyers and listservs, stopping data collection when saturation was reached (Krefting, 1991; DiCicco-Bloom and Crabtree, 2006; Bowen, 2008). This research was approved by the Institutional Review Board at North Carolina State University.

Data Collection

Before data collection, we developed a standardized interview guide that included major questions and probes (Table 1), and all three interviewers participated in standardized qualitative research training. We audio-recorded each in-person interview (45 to 90 minutes) and took detailed notes, reviewing the notes with the student at the end of each interview (Guba, 1981; Krefting, 1991). After transcribing the audio files verbatim, we used direct content analysis to analyze data to determine when

Table 1. Major interview questions and probes asked of pre-healthcare students (n=30) during qualitative interviews

1. Describe an obese child. Probe: What do they look like? Probe: How do they act? Probe: Is there anything different between a “normal weight” child and an “obese” child? Probe: Can you think of anything else?
2. What leads to childhood obesity? Who contributes to the causes? Probe: Can you think of anything else?
3. What are the consequences of childhood obesity? Probe: Can you think of anything else?
4. What should or can be done to prevent childhood obesity? Probe: Can you think of anything else?
5. Where did you learn the information you shared with me today? Probe: Where did you learn how to describe an obese child? Probe: Where did you learn the causes of childhood obesity? Probe: Where did you learn the consequences of childhood obesity? Probe: Where did you learn about the prevention of childhood obesity? Probe: Is there anywhere else you might have learned this information?

Table 2. Participant demographics of qualitative interviews with pre-healthcare students (n=30)

Characteristics	Students (#)	Percentage ^a
Major		
Biological Sciences	22	73%
Social Sciences/Humanities	8	27%
Physical Sciences	2	7%
Engineering	2	7%
Business	1	3%
Minor		
Health-related	7	23%
Biological Sciences	4	13%
Other	8	27%
Gender		
Male	8	27%
Female	22	73%
Had taken introductory nutrition course	21	70%

^a Major and minor percentages do not add up to 100% because five students had multiple majors, and of the 16 students with minors, three were double-minors.

saturation occurred (Krefting, 1991; DiCicco-Bloom and Crabtree, 2006; Bowen, 2008).

Data Analysis

Prior to data analysis, we developed five *a priori* main coding categories to help guide our analytic process. During the first phase of data analysis, we used open coding (Goulding, 1999) to develop a coding manual containing 47 sub-codes, which emerged from the data. Two of the authors coded all transcripts independently, using NVivo 9 qualitative analysis software as both a tool to code the data and to calculate reliability (QSR International, 2009). The two coders met periodically during data analysis to compare codes, reach consensus, and check inter-rater reliability (Schilling, 2006). Of note, we obtained an overall “excellent” Kappa of 0.83 (Cohen, 1960; Cohen, 1968; Landis and Koch, 1977).

The first author then independently analyzed the quotes to determine dominant emergent themes of student knowledge across each category. As a research team, we then came to consensus on the major dominant emergent themes and consulted with an expert not involved in data collection/analysis to gain an outside opinion on the relevance of themes.

Results and Discussion

Of the 30 students interviewed, the majority were majoring in a biological science (n=22) and of those with

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a minor, a health-related minor was most common (n=7). Additionally, 21 students (70%) had taken or were currently taking an introductory nutrition course (Table 2).

Two dominant emergent themes surfaced: (1) Impact of Experience and (2) Disconnect between Causes and Prevention. The first theme suggests that the types of experiences in which students participated (both curricular and extracurricular) had an impact on their depth of knowledge regarding the etiology of childhood obesity. However, the second theme proposes that these students were not thinking about the problem systematically and lacked awareness of the complexity of theory-based approaches to prevention and treatment.

Impact of Experience

When asked for their sources of knowledge about childhood obesity, students most commonly cited (1) medical school prerequisite science courses, (2) internship and community experience, (3) personal experience or observations, (4) family and (5) media. They least frequently cited (1) scientific literature, (2) medical doctors and (3) specialized courses/electives.

When discussing courses, all students cited science courses where they may have learned about anatomy and physiology, adult obesity, or diabetes. Most students also cited personal experiences interacting with obese friends and family members as a source of knowledge. When describing the opportunities for personal interactions one student said, *“Everyone’s gone to school and ... seen or [grown] up with obese children, or like me, having obese children ... runs in my family.”* These personal experiences may explain why students were able to describe the emotional consequences of childhood obesity and not just the physical effects that might have been learned in science courses.

However, the most knowledgeable students – those who could articulate a somewhat deeper understanding of the complexities of childhood obesity – also had meaningful volunteer, service-learning, or internship experiences. As one student noted, *“I’ve volunteered at the Food Bank and homeless shelters, and ... I feel like I got exposure to lower income people and realized how hard it is for them to provide healthy options.”* These opportunities allowed students to interact with obese children and their parents in a real world setting and to see the challenges associated with prevention and treatment for both families and community programs.

Two other common sources of knowledge were media and everyday conversations with friends and family. Students’ descriptions of knowledge from the media covered a wide span, from credible news sources to reality television shows. Similarly, students’ conversations with friends and family varied from conversations with parents who are healthcare providers and friends who are nutrition majors to everyday conversations about topics in popular media. Interestingly, the least cited sources of information about childhood obesity included scientific literature, doctors, and specialized courses, all more credible sources for future physicians.

Disconnect Between Causes and Prevention

The “Impact of Experience” theme purports that the more knowledgeable students were nutrition and social science majors, health minors, and students who had in-depth relationships with an obese friend or family member, and those with meaningful volunteer or internship experiences. However, even in the most knowledgeable students, we observed a disconnect between students’ descriptions of contributing factors and the prevention tactics they said would target those contributing factors.

With regard to causes, the majority of students were able to describe contributors to childhood obesity closely related to the child’s and family’s behaviors, including diet, family, and physical activity. One student said, *“I feel like a lot of obesity in children is caused from parents ... when you’re younger, especially, you ... model off your parents, and if your parents aren’t being very health-conscious or trying to eat in a healthy way, there’s not a very high likelihood that you’re [going to] do the same.”* While most students’ responses focused on parents and child’s diet, some students discussed the impact of more external factors, including the school system and parent education. While a minority, some of the more knowledgeable students were able to give rich descriptions of the complexity of contributing factors, including the barrier of socioeconomic status. One student described socioeconomic status in this way: *“[P]eople who have low incomes or who can’t afford [a store] like Whole Foods, or who can’t really get nice vegetables at Harris Teeter, they have to get the cheaper food and more inexpensive food. [For example] buying a cheeseburger at McDonalds is much cheaper than buying even a sub at Subway.”* Overall, all students were able to list the child and family-related contributing factors, but few students were able to describe more external impacts on healthy behaviors.

While most students’ descriptions of contributing factors focused on those closely related to the child and family, students’ descriptions of the causes were more comprehensive than their descriptions of solutions. In their discussions about prevention and treatment, students described programs targeting diet and physical activity through education with most students discussing programs they had seen or heard about. Popular topics included First Lady Michelle Obama’s “Let’s Move” campaign and changes to the school lunch program, two topics in the news at the time of the interviews. Additionally, students were able to describe less nutritious options from their own school lunch experience and could articulate clear changes to be made. As noted by one student, *“Just not having unhealthy options there and spending more money on making the healthy food taste good so that the children can learn that ‘Oh healthy food can be delicious!’”* Many students also pulled from their own experience building healthy lifestyle practices as children. One student said, *“[W]hen I was young, I think my parents put a big emphasis on [healthy eating], and I can tell as I’ve grown up my personal preference ... has*

come through based on their influence.” Many students received parental encouragement and explained that this was an important factor for developing healthy habits in children.

Interestingly, despite continued probing, almost all of the students failed to mention the role of healthcare providers in preventing and treating childhood obesity. Overall, students tended to focus mainly on family and school-based interventions rather than a variety of approaches to prevention (e.g. behavior change counseling and policy changes). For example, students could see that changes needed to be made to the way the food system is run, including cost and accessibility of healthy foods and marketing to children; however, they did not give clear descriptions of how this could be accomplished. This disconnect between students’ descriptions of causes and prevention indicates that their ideas of prevention are limited and not reflective of the complexity of known contributors.

The results of this study suggest that childhood obesity could serve as a vehicle by which to prepare students for the MCAT 2015® and a more prevention-based medical education. Pre-healthcare undergraduate seniors with nutrition and social science majors, a health minor, or volunteer or internship experiences were more knowledgeable about the behavioral and social determinants of childhood obesity than their counterparts. They gave descriptions of the barriers parents may face in providing children affordable, healthy foods (e.g. socioeconomic status) and the impact of current systems (e.g. school lunch program) on nutrition health behaviors. Students without this coursework and volunteer experience had a more limited view, focusing most of their discussion the child’s diet and parental influence. Also, students rarely mentioned the role of healthcare providers in prevention and treatment, despite their desire to enter this profession. In general, even the more knowledgeable students lacked depth in their understanding of the behavioral and social determinants of childhood obesity.

An understanding of the complexity of childhood obesity, leading to more effective healthcare-related approaches to prevention and treatment, can be facilitated, in part, through providing students with a social ecological perspective of the disease. This perspective on health behavior includes various levels of contributing factors and has been applied to many different health-related behaviors, such as smoking, alcohol consumption, and drug use (Simons-Morton et al., 2011). Davison and Birch (2001) depict the social ecological model related to childhood obesity with three levels of contributing factors – child, parent, and community – and posits that a child’s characteristic (e.g. health-related behavior) cannot be explained (and therefore ultimately changed) without an understanding of the context in which that characteristic exists. A more recent expansion of the social ecological model depicts the “6 C’s” of contributors to weight status: cell, child, clan, community, country, and culture (Harrison et al., 2011).

Each of these contexts exists within its own “ecological niche,” creating a model of ever-widening spheres of influence, from the child and her family to her community, society, and culture as a whole. Both models also make clear the bi-directional, rather than uni-directional nature of the interactions between the level, which is key to developing successful approaches to both prevention and treatment. For example, while parental eating behavior can influence a child’s eating habits, research has shown that the child’s characteristics (e.g. age, sex, and weight) can affect the parent’s attitudes and behaviors towards feeding her (Davison and Birch, 2001; Savage et al., 2008). This understanding of the complex bi-directional nature of interactions related to childhood obesity requires a developed sense of reasoning and analysis which the MCAT 2015® also seeks to encourage. Introducing students to a social ecological model for health behavior is one way to provide them with a framework grounded in the behavioral sciences to better understand and articulate sound prevention and treatment strategies and to describe their role as future healthcare providers in the implementation of those strategies.

Premedical programs could achieve learning outcomes related to the behavioral and social science components of public health programs, such as childhood obesity, through coursework or out-of-class experiences. For example, programs could create new interdisciplinary courses specifically targeting health-related topics such as childhood obesity, or obesity more generally, or incorporate health-related social science principles into nutrition courses where there is already a lot of overlap between biological and social sciences. Topics that might be incorporated into such courses include not only etiology frameworks such as the social ecological model, but also behavior change theories (e.g. Stages of Change) and counseling approaches (e.g. motivational interviewing) (Simons-Morton et al., 2011). These theories could be helpful, as Kaplan et al. (2012) describe, in preparing “aspiring physicians to understand patients’ social, environmental, and personal characteristics,” (p. 1267) in order to train more effective physicians equipped to consider multiple factors in prevention and treatment (Cuff and Vanselow, 2004; Kaplan et al., 2012). This undergraduate introduction to the social and behavioral sciences is especially important because, in a survey of physicians, 44% reported that medical school did not adequately prepare them to treat patients from a behavioral standpoint (Astin et al., 2006).

In addition to coursework, since pre-healthcare students already seek out internship and volunteer experiences to gain experience for professional school, undergraduate institutions can encourage students to seek out valuable experience mirrored with desired learning outcomes related to the behavioral and social sciences. For example, students could teach nutrition education programs in local afterschool programs like the YMCA, affording them the opportunity to see community

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approaches to prevention. However, consistent and meaningful outcomes are not likely to be achieved without combining that experience with academic content and guided reflection (e.g. service-learning).

Service-learning experiences have already been incorporated into some undergraduate pre-healthcare and graduate/professional school programs with some addressing obesity and others healthy living as a whole (Begley et al., 2009; Himelein et al., 2010; Anderson et al., 2011). In fact, many medical service-learning programs seek to explore complex issues, like a multifactorial understanding of childhood obesity, and have resulted in students reporting a better understanding of childhood obesity, community issues and needs, and patient behaviors both in and out of the clinic, helping students feel more prepared and eager to work in underserved communities in the future (Burrows et al., 1999; Borges and Hartung, 2007; Buff et al., 2011; Hunt et al., 2011). Combining this community experience with coursework through the vehicle of service-learning may equip premedical students to not only be more successful in their MCAT® scores but also in learning about a prevention-based approach to healthcare.

Future research could explore the effectiveness of these service-learning opportunities through analysis of guided reflection assignments, through comparison of MCAT® scores, or through differences in performance once students enter medical school. Additionally, future qualitative explorations could determine similar research questions in medical students to compare their knowledge to the knowledge of pre-medical students.

Limitations

While measures were taken to ensure that the research was unbiased and applicable to the greater population, there were still limitations to the study. Because the interviews were conducted at one institution, findings might not be generalizable to all undergraduate programs in the nation. Due to the nature of recruitment, students who volunteered for the interviews might be more interested in the topic than the general pre-healthcare student population, though we sought to increase participation of students less interested in the topic by offering a Pre-Health Club participation point incentive.

Summary

Our study provides a baseline understanding of pre-healthcare students' knowledge of childhood obesity that suggests that they need more exposure to these concepts, especially as it relates to their roles as future healthcare providers. By providing students with coursework or service-learning opportunities that link the biological and social sciences with experience with obese children in the community, students may perform better on the MCAT®, be more prepared to enter medical school with a prevention-focused mindset, and have a deeper understanding of the complexity of health.

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