

ARE COLLEGE STUDENTS AT RISK FOR IMBALANCED NUTRITION?

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Abstract

The culture of college students does not appear to give adequate attention to nutritional health. The purpose of this study seeks to explore whether college students are at risk for imbalanced nutrition. Among the studies reviewed, samples suggest that college students are at risk for imbalanced nutrition due to their financial instability, lack of nutritional knowledge, and inability to obtain healthy foods. The results of this systematic review of the literature suggest that implementations of nutritional education may reduce those risks.

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Table of Contents

	Page
ABSTRACT.....	2
ACKNOWLEDGEMENTS.....	3
TABLE OF CONTENTS.....	4
LIST OF FIGURES.....	5
INTRODUCTION.....	6
REVIEW OF LITERATURE.....	7
DISCUSSION.....	22
LIMITATIONS.....	23
ASSUMPTIONS.....	24
RECOMMENDATIONS.....	25
CONCLUSION.....	25
REFERENCES.....	27

List of Figures

	Page
Figure 1	8

Are College Students at Risk for Imbalanced Nutrition?

Introduction

Imbalanced nutrition, meaning consuming more than or less than body requirements, can place one at risk of developing various illness and diseases. One who consumes more than body requirements may elicit signs of weight gain and decreased activity expenditure due to excessive intake or undesirable eating patterns. Consuming more than the body's requirements can place one at risk of becoming overweight or obese, and possibly developing hyperglycemia, hypercholesterolemia, hypertension, and/or hyperlipidemia along with a number of other various medical conditions (Vera, 2014). These preventable issues can lead to a lifetime of medication and hospital bills, which can place the patient and also the caretaker under stress. When one consumes less than body requirements, he or she becomes at risk for malnourishment. This can lead to increased risk of infection, reduced muscle and tissue mass, decreased mobility, and in extreme cases, anorexia nervosa (Malnutrition, 2009). A balanced diet is an important part of living a healthy lifestyle. Food contains nutrients which provides the body energy, protein, fats, and vitamins and minerals to live, grow, and function properly (Malnutrition, 2009).

The purpose of this study is to answer the question of whether college students are at risk for imbalanced nutrition. According to a recent survey concerning the recreational activities of college students, participants reported frequent alcohol consumption and high rates of utilization of tobacco products among this population (Douglas, 2013). Not only do these behaviors contribute to an unhealthy lifestyle, but they may also contribute to imbalanced nutrition. Facing competing priorities, socially, financially, and

academically, college students may be forced to choose between convenience and cost versus health. This research seeks to identify whether or not these factors place this population at risk.

Review of Literature

To explore the population of college students, this review explores studies related to college students' and their nutritional knowledge and intake habits as well as including studies that explore barriers to obtaining optimal nutrition. A study published in the American Journal of Preventative Medicine found that "Thirty-five percent of college students are overweight or obese and almost half (46%) report trying to lose weight," (Lowry et al., 2010). Lowry and his colleagues attributed these findings to lack of physical activity along with unhealthy dietary habits, i.e. consuming less than 5 servings of fruits and vegetables in a day. These researchers concluded that educational programs should be implemented to increase student awareness of healthy weight management as well as the importance of the combination of a healthy diet and physical activity (Lowry et al., 2010).

Two Malaysian researchers examined the population of college students by reviewing 14 studies which involved college students' education on nutrition. Pei Lin Lua along with her colleague, Wan Dali Wan Putri Elena, from the Penerbit Universiti Sains Malaysia's Faculty of Medicine and Health Sciences, reviewed a total of fourteen articles involving nutrition education implementations for college students published from 1990-2011. In total, data was collected from 1668 participants across the fourteen studies. The ratio of female students to male students included in these studies was 2:1, with the number of female students and male students totaling 1113 and 555,

respectively. Of the studies reviewed, the three main interventions used to provide nutrition education to the students were web-based education, lectures, and supplemental provisions. Nearly all the studies included measures of dietary intake, such as food records, food frequency questionnaires, and dietary habit questionnaires. The students' outcomes of dietary intake improvement were measured based upon various criteria including physical activity, consumption of food, nutritional knowledge, dietary habits, and overall quality of life (Lua & Wan Putri Elena, 2012).

Methods used in these studies included a cross-sectional study, four randomized controlled trials, and nine longitudinal studies. Most of the studies reviewed by Lua and Wan Putri Elena measured dietary intake and improvement by using food diaries or a 24 hour recall before and after the implementation of the nutrition education. The supplement provision in addition to the nutrition education provided to the participants showed an improvement in understanding body composition and its relation to diet and exercise, dietary habits, dietary nutrient intake, and quality of life in the sample of college students from the study conducted in Korea. Other studies included in this review, showed increases in consumption of fruits and vegetables among participants in the United States and Israel, however researchers did not provide a generalized definition of "healthy eating" to expand across all the studies. This problem was never acknowledged by researchers, simply referring to dietary improvement without further insight.

The female to male ratio across all studies was not an accurate representation of both genders. However, at the time of this research the average female to male ratio among colleges in developed countries was 2:1 so it is representative of the college population (Lua & Wan Putri Elena, 2012). Lua and her colleague believed that female

participants were more likely to volunteer to participate than their male counterparts due to a higher interest in healthy dieting and weight management. These researchers from Penerbit Universiti Sains Malaysia believed that this increased interest of female participation was in part due to fashion trends and media portrayals of women to which some feel obliged to conform (Lua & Wan Putri Elena, 2012).

In more than half the studies, there were no preparatory evaluations of the interventions applied and as a result no modifications could be implicated to improve the study. This could potentially lead to unnecessary methodological flaws if the study were to be duplicated. Lua and her colleague were especially concerned with this because this topic of college students' nutrition already appeared to be lacking. Even stating that they could not "provide a more comprehensive, potentially less-biased review with such a small number of reported randomized controlled trials," (Lua & Wan Putri Elena, 2012). The researchers encouraged further trials be conducted, with more detailed methodology, including specified parameters for measuring dietary intake as well as students own perceptions, to provide more information on this important, yet understudied topic.

Although Lua's research predominantly showed female representation across the fourteen studies, a study done by Cynthia Strawson and colleagues from the University of Alberta found that "nutrition education alone may be insufficient to ensure optimal dietary patterns among female university students" (Strawson et. al., 2013). Female college students who had taken at least one nutrition course were given food frequency questionnaires to determine whether the course had any impact on their dietary patterns, specifically to see if students had adopted a diet similar to the ones recommended in their course, Eating Well with Canada's Food Guide (EWCFG) or the Traditional Healthy

Mediterranean Diet Pyramid (THMDP) (Strawson et. al., 2013). The researchers paid particular attention to the foods these diets strongly recommended, such as fruits and vegetables, whole grains, olive oil, and legumes, nuts, and seeds. Strawson et. al. found that “the majority of participants did not meet the minimum EWCFG recommendations for any of the food groups,” (Strawson et. al., 2013). Strawson and her colleagues concluded that “nutritional knowledge is one of many factors that influences food choice [...] and nutrition education may be insufficient for encouraging Canadian university students to follow dietary guidelines,” (Strawson et. al., 2013).

One researcher sought similar information regarding what online resources were available to students, as her research prior to this study suggested that nutrition education did not seem to positively impact college students (Cousineau, 2013). Research scientist Tara M. Cousineau at Inflexxion, reported a lack in online resources directed at college students regarding nutritional information. With the help of her colleagues, Tara M. Cousineau sought to acquire data in building an online nutrition resource for college students. The first goal of her research strived to explore what information was already available online for college students by searching for nutritional education that would appeal to this population. The researchers chose 5 key word groupings to result in nutrition-related websites for college students, “nutrition, college students; diet, college students; nutrition program, college students; teens, nutrition intervention; and weight management in college,” (Cousineau, 2013). The second part of this research gathered data to understand what college students wanted regarding nutritional information and compared their beliefs to the ideals of the health educators and counselors in place at each campus.

To conduct this study, Cousineau and her team of researchers split the methodology into two portions, an analysis of nutrition content online directed towards college students, and three sessions of focus groups to understand the perspective of college students regarding their views of nutrition. For the online analysis, this group of researchers chose 5 key word groupings that would most likely appeal to college students. These key word groupings included "nutrition, college students; diet, college students; nutrition program, college students; teens, nutrition intervention; and weight management in college," (Cousineau, 2013). These researchers were surprised at the lack of nutrition information available to college students. Many of the sites found by searching these key-words were not directed towards students. Only 4 of the 232 web links analyzed had interactive features and quizzes which attempted to appeal to college students. While this was a surprise to the researchers, it allowed them an opportunity to assess flaws and work on improving the online information available to students.

For the second portion of the research to explore the importance of nutrition related topics among college students, Cousineau held 3 focus groups of 9 students each for a total of 27 college students along with health experts from the institutions in two locations; one on a campus in the South and two on a large college campus in the Northeast. Of this sample of college students, 56% were female, 44% male, and 59% were minorities, mostly African American and Hispanic/Latino. Different from Lua's research which exhibited a 2:1 ratio among females to males, this study more closely provided equal gender representation. Cousineau and her team wanted to ensure that diverse groups would be represented in the research which was not identified in Lua's research. Each focus group contained 9 college students, 2 health administrators, 2

counselors, a dietician, and a nurse. These health experts from each college campus were included to provide their own perspectives on importance of nutritional topics to see if there lie any discrepancies between students on campus and the health counselors. In each focus group, students first reflected on their feelings toward maintaining balanced nutrition in college. Students and health experts then rated various nutrition related topics on their relative importance to college students. The topics included healthy eating on a budget, body image and weight concerns, expert opinions on nutrition, healthy meal planning, and basic nutrition facts.

Cousineau and her colleagues found that students and health experts had high rates of agreement on the importance of topics. The only exception to this was where students perceived body image and weight concern to be more important than nutrition advice, whereas the health experts had opposite views. Students rated the categories in order of importance as follows, (1) healthy eating on a budget, (2) healthy meal planning, (3) Basic nutrition facts, (4) Body image and weight concerns, and (5) expert nutrition information. While these rankings held similar orders, students gave more importance to basic nutrition facts than the experts as shown in Figure 1. “Correspondence between expert and student rating (pattern match)” (Cousineau, 2013). The left side of Figure 1 shows the average rankings of the importance of nutritional topics of the campus’s health experts and research staff. The right side shows the students’ rankings. The higher the item on each side indicates the group’s perceived importance of the topic.

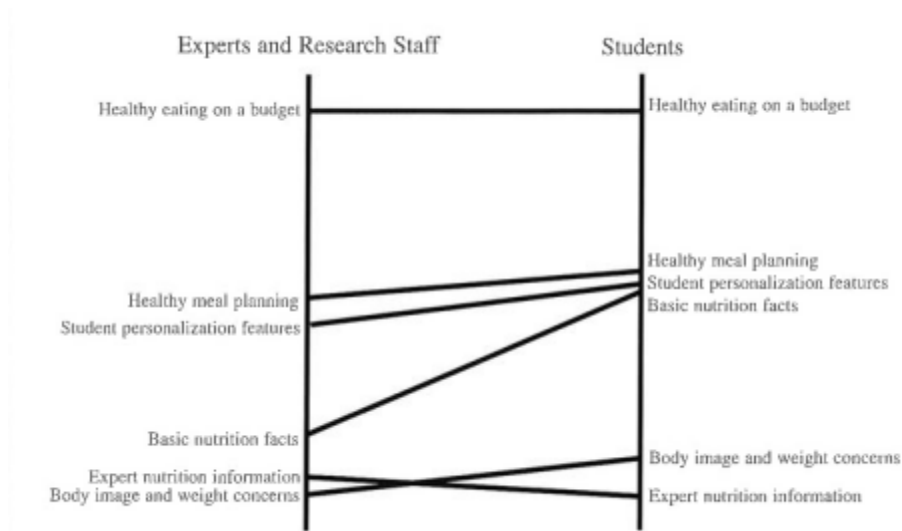


Figure 1: “Correspondence between expert and student rating (pattern match)”

This research provided insight to the lack of availability of online, nutritional information directed toward college students. It did not, however, explore college students’ backgrounds in nutrition. While this study did not measure the sample of the college students’ baseline knowledge, it provided insight to the aspects of nutrition education that appeals to the traditional age college aged student. Students rated healthy eating on a budget to be of the highest importance out of the five topics. Students also rated basic nutrition facts much higher than that of the experts. This could suggest that the experts perceived the college students to have more basic knowledge than what the college students reported. This raises the question of what these students know and what they’ve been exposed to thus far regarding nutritional information.

The students from Cousineau’s study ranked the experts’ opinions as the lowest out of the options related to nutrition. This suggests that students either don’t care to know about the experts’ opinions, or that compared to their other options, the students do not believe the experts opinions to be of the highest importance. This raises the issue of

preference and how the traditional age college students uses different resources than the experts do. This generation of students has been heavily influenced by technology as it has become an integral part of their lives.

College students appear to be very involved in technology, something that guided Cousineau's research as well as Melton's. Bridget Melton, an associate professor in Health and Fitness at Georgia State University conducted research exploring technology's effect on the health behaviors of college students. Melton and colleagues noticed the amount of time this population spent staring at screens and using technological devices, such as accessing the internet through their phones and computers or watching television. When surveyed, the students included in Melton's research reported spending an average of 18 hours per week online (Melton et. al., 2014).

By using a quantitative, descriptive, cross-sectional design, 591 students from the Georgia State University completed the survey sent out via email. The 28-item questionnaire included questions assessing technology usage, sleep, nutrition, physical activity, and demographics. Nutrition was assessed by measuring students' reported daily intake of fruits and vegetables by using guidelines from the American College Health Association's National College Health Assessment (Melton et. al., 2014).

The researchers conducting this study regarding health related behaviors and technology usage among traditional age college students found that these students on average spent a total of 258 minutes per week using social media, such as Twitter, 254 minutes per week watching television, 203 minutes per week using the internet for general purposes, and 21 minutes per week using the internet for fitness related and/or health related purposes (Melton et. al., 2014). Melton et. al. also found that when

compared to the American College Health Association's guidelines that "on average, participants reported eating less than half the recommended servings of fruits and vegetables a day [...] indicating that the more technology is used the less advantageous it is for one's health particularly as it pertains to healthy eating," (Melton et. al., 2014). Melton et. al. believed that because "college students' nutritional behaviors are poor with only 5% of this population meeting the recommended amount of 5 servings of fruits and vegetables each day, one might make a potential impact with nutritional technology," (Melton et. al., 2014).

Although nutritional technology could potentially impact college students' knowledge and understanding of proper nutrition, there is no explanation as to why students are not competent in basic nutritional knowledge as it is a requirement to include in the curriculum of public schools across the United States (McCaughy et. al., 2011). One study that may be able to answer that question comes from a group of researchers from the Center for School Health and College of Education at Wayne State University. Nate McCaughy and his colleagues examined middle school health educators on the quality of their teachings of nutrition. McCaughy and his team of researchers were also looking to understand the health education teachers' awareness of the policies in place regarding nutrition education and how their awareness impacted their students. There are health policies in place, yet there still exists a rising childhood obesity rate, so researchers were determined to discover whether or not the discrepancy had anything to do with the education these children were receiving. Because childhood obesity has been steadily rising over the past few decades, the researchers from Wayne State University chose to explore whether the problem could potentially stem from the children's nutritional

education. Not only is nutrition an important part of living a healthy life, but a correlation exists among children with improved nutrition having stronger academic performance (McCaughtry et. al., 2011).

This research accumulated data from 24 middle schools from one urban district in the Midwestern United States, gathering perspectives from a total of 27 health teachers. McCaughtry and colleagues used interpretive ethnographic methodologies to acquire research. This included observation of health classes, interviews with health teachers and administrators, as well as collecting pertinent documents on the district's wellness policies, health education curriculum scope, health teachers' lesson plans, and instructional texts.

These Wayne State University researchers found that health teachers were not following any specific guidelines regarding nutrition education. Most health teachers reported they felt it was their duty to teach children about nutrition, however the majority of these teachers also reported not incorporating nutrition into their lessons. Based upon the educators' interviews, the researchers found that the average middle school student in this district was taught fewer than three lessons on nutrition in the span of their time in grades 6, 7, and 8. Within the district's policy regarding health education, the curriculum stated requirements of at least six full nutrition lessons for seventh and eighth grades. This requirement was obviously not being met as evidenced by the responses of the teachers. The school district had a main policy in place concerning nutrition education, the National Health Education Standards (NHES), which served as a basis for the development of the state's health education curriculum. It was found that while most of the health teachers had heard of this policy, the majority, 24 of the 27 teachers surveyed,

admitted to not having read the policy (McCaughtry et. al., 2011). McCaughtry and colleagues believed the teachers' unfamiliarity with this policy could have impacted their lessons by reducing the amount of nutritional education they were able to provide their students. The health education teachers' attributed this ignorance on their district's policy to their lack of training.

Not only did these teachers lack in training, but there was also an unavailability of resources given to the health educators. These health teachers cited outdated resources as only one of the 27 was aware of the health education department's 'lending library.' The teachers are able to continue such ineffective teaching because they are not being held accountable. When interviewed, one school principal reported a lack of supervision concerning health educators. This principal told researchers that he did not provide health teachers with his expectations of their course requirements. The district's assistant health director expressed to researchers that she was unaware of the development in nutrition education that had taken place over the last ten years.

McCaughtry and colleagues' research was able to identify issues in the deliverance of nutritional education to young students. The research suggests that these health teachers are not meeting the standards of nutrition education. It seems that although the policies in place and the expectations of the individual schools, students simply are not being taught about nutrition in the curriculum. With obesity being as prevalent as it is, this research suggests that there is not enough being done within the scope of providing education to the students. This is not the only variable, however, involved in preventing obesity or in preventing students of any age of becoming at risk for imbalanced nutrition.

While some students may be lacking in knowledge, the problem stretches further than that for many college students, particularly due to finances (Patton-López et. al., 2014). Megan Patton-Lopez, and her group of colleagues from Oregon State University, conducted research exploring the financial aspect's effect on college students' availability of healthy foods. This research explored the dietary limitations of a sample of 354 college students, aged 18-22, attending a midsize rural university in Oregon. Researchers sought to examine the prevalence of food insecurity as well as identifying correlates of food insecurity among these students. Food insecurity is defined by the authors of this study as "the limited or uncertain availability of nutritionally adequate and safe foods, and limited or uncertain ability to acquire acceptable foods in socially acceptable ways" (Patton-López et. al., 2014). This is important because food insecurity can disrupt development, especially cognitive, academic, and psychosocial development for college students. College students have a higher prevalence of food insecurity compared to the general population, where 15% of the general population experiences food insecurity and 59% of college students experience the same phenomenon (Patton-López et. al., 2014). Populations with higher rates of food insecurity are at risk for imbalanced nutrition.

The researchers of this study emailed their survey to all students attending a midsize rural university in western Oregon in May 2011. Of the 5,438 students emailed, 354 responded to the 40-item survey, a 7% response rate. This cross-sectional, non-probability, web-based survey allowed for students to complete it on their own time in the two-week period during the data collection period researchers gathered data. The survey included questions concerning students' financial standing based on their financial

aid and management of funds as well as perceived health. These questions were based on previous research regarding food insecurity (Bickel et. al., 2009; Coleman-Jensen & Nord, 2012; Hughes et. al., 2011; Chaparro et. al., 2009; Subramanian et. al., 2009). The survey also sought information pertinent to the population in study that asked about the student's GPA, health insurance, meal plan, and living arrangement.

Patton-López and her team of researchers found that food insecurity affected more than half of the students surveyed, much more than that of the general American population (Patton-López et. al., 2014). Researchers extrapolated that college students experience higher rates of this due to their lack of resources and lack of means to obtain healthy foods. More than half of the students surveyed "required financial assistance" meaning they received financial aid in the form of "scholarships, private and federal loans, and/or grants," (Patton-López et. al., 2014). This study also noted a strong correlation between food insecurity and a lower academic performance where "students who report experiencing food insecurity are less likely to report a GPA of [greater than or equal to] 3.1," (Patton-López et. al., 2014).

While this study was able to identify college students at risk of nutritional imbalance related to their food insecurity, it was unable to accurately detect their current state of health. Imbalanced nutrition can potentially place a person in danger of becoming overweight, obese, or underweight possibly leading to the development of a weight related disease such as diabetes, hypercholesterolemia, hyperlipidemia, or malnourishment (Vera, 2014). This study allowed students to self-report their perceived level of health which is subjective and therefore difficult to quantify.

Although requiring financial assistance impacted these rural college students' abilities to acquire healthy foods, low socioeconomic status is not the only deciding factor in placing a college student at risk of imbalanced nutrition. In Dr. Jana Kicklighter's study, conducted by her team of researchers from Georgia State University, a nutrition education program was found to be beneficial for the participating students as students reported learning from the module and adapting their diets accordingly. The purpose of this study was to identify college students' perceptions of Nutrition education. The authors chose to focus on college freshman attending an urban university because these students were experiencing independence for the first time, still adjusting to college life, and also presented as a population at risk for imbalanced nutrition. A decade before this study was conducted, in 1998, the rate of obesity among college students was 12% and tripled ten years later in 2008 to 36%. Direct care providers of college students reported that the population has experienced an increase in the likelihood of being overweight or obese and also reported an increase in hypertension and hyperglycemia (Kicklighter et. al., 2010). The researchers suggest that this increase is due to the lifestyle of a typical college student, related to his or her environment and/or lack of nutritional knowledge along with a number of other factors, however the researchers chose to explore nutrition education.

Kicklighter's research methodology planned to address students' perceptions of nutrition teaching using the Nutritional Survival Skills module which consists of a brief PowerPoint presentation followed by a nutrition survival game. The modules were taught by graduate nutrition students to various sections of the New Student Orientation course for college freshmen during the Spring of 2008. Each section consisted of 12 to 25

students. Focus groups followed in two to five weeks time after the students' participation in the module. Kicklighter and her colleagues split participants into one of five focus groups, totaling 34 students in all. Both quantitative and qualitative data were collected when students were asked open- and closed-ended questions regarding their experience with the Nutritional Survival Skills module.

These researchers found that the college students who participated in the focus groups gained new insight regarding nutrition from the Nutritional Survival Skills module. One student noted that he was unaware of the abundance of the calories and fat found in fast food. Other students had learned more about portion sizes and portion control for which they had no prior awareness. Students were hesitant to make major behavioral changes, however one student stated that she would begin eating breakfast. Another student decided to limit his intake of soft drinks and other sugary beverages. Overall the students reported positive feelings about the module as it was presented in a noncritical manner with relatable concepts directed towards their lifestyle. There were a few students dissatisfied with the teaching, complaining of the lack of information on exercise and muscle gain or the lack of challenging recipes.

The research conducted in Kicklighter's study was very focused on the population of traditional age college students. The researchers were able to gather a significant amount of data on the contributing factors of imbalanced nutrition for this group. This study demonstrates that education can positively impact the population at hand. Students reported perceived benefits from the seventy-five minute module. This research was not a longitudinal study, however, which would make it difficult to look at its effect on the students over the long-term.

In this review of literature, the majority of the studies included suggested a lack of knowledge regarding nutrition among college students. Based on this research, it seems that providing a supplemental educational course to this population may be beneficial as groups of students from Kicklighter's and Lua's research reported improvements in healthy dieting, i.e. consumption of more servings of fruits and vegetables. However, regardless of students' improvement or perceptions of nutrition, the majority of studies included in this research, Cousineau, Kicklighter, Lua, and McCaughtry, showed an overall lack of nutritional knowledge among students and teachers providing the nutritional education.

Discussion

In my limited systematic review of literature, I found that many of the studies included supported my hypothesis, "Are College Students at Risk for Imbalanced Nutrition?" Among the articles reviewed, nutritional education seemed to improve college students' nutritional habits as exhibited by their dietary patterns and intake of fruits and vegetables (Kicklighter et. al., 2010; Lua & Wan Putri Elena, 2012). Strawson's research did not support this data as she and her team of researchers concluded that nutritional knowledge may be insufficient for encouraging students to follow healthy guidelines. In Strawson's research, however, students' dietary habits were examined after they had completed a course in nutrition with no time frame in place from when the course was taken to when the research was conducted. In Lua's research totaling 14 studies, or Kicklighter's study, students' dietary habits were assessed only weeks after the nutrition education course. Regardless of whether or not nutrition

education was able to help students, it seemed that students who were seeking to become healthier were able to achieve that with the implemented nutrition education program as concluded in Kicklighter's research.

Limitations

This review of literature was limited by the few number of articles reviewed. Although some of the articles were very informative, such as McCaughtry's study, it was not able to speak for the population of college students. His study concluded that the health education for middle schoolers may not be adhering to the district's policy, however this is not necessarily why college students lack in nutritional knowledge. While Kicklighter's study benefitted the research by providing students' perceptions of an implemented nutrition program, the group of students sampled was limited, acquiring data from a mere 34 students.

Many of the studies included questionnaires and qualitative measurements for acquiring data. The answers to the questionnaires may be skewed based on the students' understanding of the material. Students may also have answered questions based upon what they thought the researchers expected of them or based upon knowledge of nutrition acquired before the information given. Students may have interpreted the survey in a different way than the researchers had intended. Melton noted in her limitations that the possibility of students embellishing their record of physical activity and healthy eating could have contributed to unreliable data. This is not only possible in Melton's research, but any of the research where students were able to self-report perceived health. This method of data collection occurred in the research of Kicklighter, Lua, Patton-Lopez, and

Strawson. The food frequency questionnaires are not uniform enough to present as significant data as a generalization across all these studies.

Lastly, some studies included students from other countries. Knowing that nutrition is closely tied to culture, we cannot assume that all college students polled have similar values and expectations concerning nutrition.

Assumptions

It was assumed that college students were the traditional age, 18-24, lived on campus, were not taking nutrition courses, and were not able to travel outside of a limited radius. The mean age for college students in the United States is 18-24 and has stayed in that range for decades (Hecking, 2013). There was also no regard to the financial standing of these students as Patton-Lopez highlighted money to be a significant factor in providing students with the ability to afford and obtain healthy foods. This limited data may not be applicable to the greater population depending on the ages of participants and that of the general U.S. college population.

Many of the studies included the term “healthy eating” however there was no consistent definition of this. Most of the studies including this term defined healthy eating using specific guidelines which recommended a daily serving of 5 fruits and vegetables. This was exhibited in Kicklighter’s, Melton’s, and Strawson’s research. Lua’s research noted improvements in students’ diets but was unable to definitively report how students’ diets improved. Patton-Lopez also used this term in her research, and although it did not focus on students’ perceptions of health, there was no clear definition of “healthy eating.”

Another assumption prevalent across the studies was the idea that unhealthy eating correlated with obesity. Although most studies did not measure students who were

overweight and obese, most assumed that this was the risk of unhealthy eating. Students can be overweight or underweight and eat healthy, however they may also be at a healthy weight and not consuming the recommended amounts of healthy foods. Assuming overweight students are more likely to subject to unhealthy eating allows for students at risk for malnourishment to go unnoticed.

Recommendations

In further research, more information should be collected regarding college students' knowledge of nutrition, what they know, and where they learned this nutritional information. Across these studies, researchers never sought to answer the question of what the students sampled already knew about nutrition. Further research should also focus on seeking a uniform, updated nutritional and dietary guidelines as McCaughtry's study indicated health educators' may have a lack of updated knowledge regarding this topic. More steps need to be taken to prevent college students from imbalanced nutrition and becoming malnourished, overweight, or obese if these conditions are already prevalent. This subject regarding college students' nutritional education may need to be explored further.

Conclusion

It seems that based on this research, nutrition education, a factor which may positively or negatively impact nutrition, lacks in the populations sampled; although, this is not the sole factor in determining one's risk for imbalanced nutrition. College students are exposed to stress and do not appear to give enough time or attention to their health based on Lua's, Kicklighter's, Patton-Lopez's, Cousineau's, and Melton's research. A

theme of negligence toward healthy dieting was consistent throughout the research included. Healthy eating did not appear to be a priority for this population which places them at risk for imbalanced nutrition.

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