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Nutrition Education in Team Nutrition Middle Schools: Teachers' Perceptions of Important Topics to be Taught and Teaching Curriculum Used

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ABSTRACT

Purpose
The purpose of this study was to assess the nutrition topics teachers identified as important, the topics they actually taught and the curriculum materials used to teach nutrition in the classrooms of seventh grade students. Additionally, the teachers' attitudes and confidence levels regarding nutrition education were assessed.

Methods
A 19-item online and paper questionnaire, adapted from previously validated instruments, was used to obtain the data.

Results
The sample included 103 seventh-grade teachers in Louisiana. The majority of the respondents were Caucasian (80%) and female (98.1%). Healthy food choices were perceived as an important nutrition topic while Food Guide Pyramid was the most commonly taught topic. Majority of the teachers (92%) reported including nutrition in their classroom and being confident (93.2%) teaching nutrition. Slightly over half of the teachers (52%) stated that they were not provided with a curriculum in nutrition to guide their teaching efforts, and only 12% of the teachers said they had received staff development in nutrition in the last year. Despite the fact that all participants were from Team Nutrition schools, only 19% used Team Nutrition materials.

Application to Child Nutrition Professionals
This study shows a need to develop a standardized nutrition curriculum that is easily available to teachers expected to teach health related topics including nutrition. Teachers' perception of the important nutrition topic to be taught seems to determine the topics they actually teach, leaving out important topics that are not perceived as important by teachers. Faculty in institutions of higher education and members of nutrition professional organizations can play an important role in influencing teachers' perceptions by offering continuing education opportunities in topics of importance as evidenced by current research.

INTRODUCTION

The Child Nutrition and WIC Reauthorization Act of 2004 requires that all local school agencies that participate in the United States Department of Agriculture (USDA) School Meal Programs establish a local school wellness policy by School Year 2006. The policies aim to improve school children's health and prevent childhood overweight by creating a healthy school

environment. More specifically, the policies should include nutrition education as well as nutritional guidelines for all foods available on each school campus and physical activity. Good nutrition is an important step in enhancing a student's readiness to learn because well nourished, healthy students come to class mentally and physically prepared to learn (Mullen & Shield, 2004).

School-based nutrition programs, with access to the majority of the nation's children (95%), have the potential to influence children's development of healthy dietary practices. In addition, school children spend over 26 hours in school during a regular week (Sturm, 2005). Studies have shown that students are more likely to make healthful eating choices when they receive consistent, reinforced messages in an encouraging environment (Perez-Rodrigo & Aranceta, 2003; Sallis et al., 2003).

Traditionally, the primary promotion of nutrition among school-aged children has been through the government regulated child nutrition programs such as the National School Lunch Program (Hoelscher, Evans, Parcel, & Kelder, 2002). However, these programs do not mandate nutrition education in schools; their primary role is to provide financial support and nutrition standards for meals served. The Team Nutrition initiative was developed by USDA as a multifaceted approach to encompass the entire school environment. Schools throughout the United States are given an opportunity to be Team Nutrition schools. USDA maintains a database of these schools on its website (http://teamnutrition.usda.gov/database.html). Team Nutrition provides support and training at the state and local levels through infrastructures such as learning activities, lesson plans, and onsite training for foodservice workers (Levine et al., 2002). However, Team Nutrition involvement is voluntary; thus the extent and nature of participation cannot be enforced or assumed. Therefore evaluation of actual involvement in the Team Nutrition initiative is essential to assess its role in promoting better nutrition and physical activity habits.

Teachers have the potential to play a significant role in an effort to improve or positively influence students' dietary behaviors (Kubik, Lytle, Hannan, Story, & Perry, 2002). However, to effectively teach nutrition, adequate training for teachers in the content area and opportunities for continuing education are imperative (Renaud et al., 1997). Motivation and interest among teachers; support provided by program leaders and the administrators; and the availability of education materials can affect the level of nutrition education implementation within the curriculum (Lytle, Gerlach, and Wienstein, 2001). According to a study by Cantrell, Young, and Moore (2003), teachers' sense of self-efficacy is one of the few characteristics consistently related to students' achievement. In addition, teachers who reported high levels of self-efficacy display greater variety in teaching methods, seek out new resources, and develop more challenging lessons (Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). To enhance confidence in nutrition education there is a need for staff development programs that emphasize teaching methods and the provision of curricula specific to adolescent nutrition (Hoelscher et al., 2002).

A necessary component to comprehensive and sequential nutrition education is teachers' knowledge of cultural food practices that children and their families follow (Koplan, Liverman, & Kraak, 2005). Practical education that develops consumer skills such as choosing healthful snacks, reading labels, and understanding messages presented in food advertising may help students become wise consumers who are able to make good food choices (Keirle & Thomas,

2000). For example, the Team Nutrition curriculum *yourSelf* was developed for use with middle-school students. It includes information on food groups and recommended servings, based on USDA food guide pyramid, as well as guidelines regarding weight and health. It also includes practical guidance and activities related to choosing snacks, understanding advertising and media, and reading labels. *yourSelf* materials and teacher's guide can be downloaded from the USDA website: (http://teamnutrition.usda.gov/Educators/yourself.html).

The purpose of this study was to assess the nutrition topics teachers identified as important, the topics they actually taught, and the curriculum materials used to teach nutrition in the classrooms of seventh grade students. Additionally, the teachers' attitudes and confidence levels regarding nutrition education were assessed.

METHODOLOGY

Participants

There are a total of eight school regions and 66 school districts in Louisiana. To ensure a random selection that provides statewide representation, and a sufficient number of schools such that the study has a statistically large sample population (n>30), schools were randomly selected two districts from each region, for a total of 16 districts with an appropriate mixture of urban and rural districts. Within each of the selected 16 school districts, three schools with a 7th grade class were randomly selected for a total of 48 schools. At an anticipated participation rate of 66 percent, 32 of these schools, two from each district, were selected for participation. Participants in the study were seventh grade teachers who taught nutrition, family and consumer sciences (FCS), or health education (HE) classes. Parish superintendents and principals of the selected schools were contacted to request permission to participate in the study. Once permission was granted, the questionnaire was sent to the teachers who taught family and consumer sciences or health education courses. Both web based questionnaires and hard copies were utilized to accommodate teachers without internet accessibility on request. Participation was voluntary and informed consent was requested, confidentiality of the participants was assured. The study was approved by the Louisiana Tech University Human Subjects Committee.

Instrument

The questionnaire used for this study was a 19-item instrument, with three main sections. The first section assessed teachers' demographic data, including gender, age, years of teaching experience, and educational background. The second section assessed resources used and teacher attitudes about teaching nutrition. Given a list of nutrition topics participants were requested to indicate the topics they perceived as important and indicate whether they taught those topics. Although most questions included structured choices every question had a section or other giving the participant an opportunity to include items not listed. To assess the method teachers used to reward students for good behavior, participants were given a list of options that included food and non-food methods. This section was adapted from the SHAPE California 2001(California Department of Education, 2001), and the Team Nutrition Program Pilot Study (Levine et al., 2002). The final section measured teacher's confidence in teaching nutrition, using the Nutrition-Teaching Self-Efficacy Scale for Elementary School Teachers (NTSES), developed and tested for reliability by Brenowitz and Tuttle (2003).

Data Collection
The first step in our data collection involved a telephone call to the selected schools to identify the teachers who taught family and consumer science and health courses, and to assess their preferred format for the questionnaire. A total of 44 questionnaires were administered through the web, and 59 hard paper questionnaires were mailed to schools without internet connectivity or to individuals who preferred hard copies. The hard copy questionnaire was mailed along with a stamped, addressed envelope with a cover letter and a consent form, while the consent form and a cover letter were posted on the web for those who preferred the web format.

Data Analysis
All statistical analyses were completed using SAS (SAS Institute, Inc., version 9.1.3, Cary, NC, 2003). Cumulative frequencies and percentages were calculated for participant demographic information, nutrition topics perceived as important, and nutritiontopics taught in class. A Chi-square analysis for a two by two contingency table was performed in order to evaluate the relationship between topics teachers reported to be important and the topics they actually taught.

RESULTS AND DISCUSSION

A total of 103 teachers completed the survey (100% return rate). The high response rate is a function of identifying the specific teachers to send the questionnaire or e-mail to through the initial telephone call and the convenience of the web format and self addressed return envelope. The majority of the respondents were Caucasian (80%) and female (98.1%). The largest group of teachers (39%) was between 31 and 40 years of age and others were evenly distributed among 20-30, 41-50, 51-60, and 61+ years of age. Slightly more than one-third of the teachers (38%) reported teaching experience of 6 to 15 years and the remaining teachers were evenly distributed between 0-5, 16-25, and 26+ years of experience (Table 1). The majority of teachers (73%) had a FCS background, while slightly less than a third (27%) had other backgrounds such as Science, Physical Education, or Elementary Education.

Table 1. Gender, Race, Age, and Years of Teaching Experience of Seventh Grade Teachers (N = 103)

Variable	FCS (n=75)		Other (n=28)		All Teachers (n=103)	
	No.	%	No.	%	No.[a]	%[b]
Gender						
Males	1	1	1	1	2	2
Females	74	72	27	26	101	98
Race						
African American	14	14	6	6	20	20
Caucasian	56	57	22	22	78	80
Age						
20-30 years	7	7	8	8	15	15
31-40 years	32	33	7	7	39	39
41-50 years	13	13	6	6	19	18
51 + years	19	18	7	7	26	26
Teaching Experience						
0-5 years	12	12	10	10	22	22
6-15 years	30	30	8	8	38	38
16-25 years	14	14	4	4	18	18
26 + years	15	15	6	6	21	21

[a] all values may not equal 103 due to missing data
[b] may not equal 100% due to missing data

Nutrition Instruction

Almost all (92%) teachers reported including nutrition in their classrooms, and most (65%) reported teaching nutrition as a stand alone topic. Even though this group of teachers reported teaching nutrition in their classes, only 34% of teachers reported teaching nutrition on a weekly basis and only 15% of the teachers reported working with foodservice staff to reinforce classroom instruction (Table 2). The use of food to reinforce behavior by teachers was also assessed in this study. Most teachers (80%) denied rewarding students with candy, with almost half of the teachers rewarding students with non-candy snacks (45%), water (27%), or more recess (21%).

Table 2. Summary of Teachers' Nutrition Education Patterns and Resources (N = 103)

Variable	All Teachers (n=103) Yes %	No %[a]
Do you teach nutrition in your classroom?	92	8
Do you teach nutrition as a stand alone topic?	65	23
Do you teach nutrition daily?	34	66
In the past year have you worked with your school's foodservice staff?	15	80
Education materials used for instruction:		
American Heart Association	62	23
American Cancer Society	40	41
5-A-Day	30	49
Dairy Council	27	50
Team Nutrition	19	72
Does your district provide a scope and sequence in nutrition to guide your teaching efforts?	39	54

[a] percentages may not equal 100% due to missing data

Nutrition Topics Identified as Important and Topics Actually Taught

Most teachers (67%) identified "Healthy Food Choices" as an important nutrition topic for seventh grade students, followed by "Snacks and Fast Food" (64%) and "Nutrients in Foods" (63%). A few of the topics identified as important include "Nutrition for Sports Performance" (45%) and "Recognizing Advertising Techniques" (46%). Many topics teachers perceived to be important were also what they actually chose to teach. For example, among the topics that teacher's most often indicated as important were "Nutrients in Food" (63%) and "Food Guide Pyramid" (62%) whereas those topics most frequently identified as being taught included "Nutrients in Food" (52%) and "Food Guide Pyramid" (56%). However, although slightly more than half (56%) of the teachers identified "Weight Management" as important, it was only taught by 37% of the teachers. Similarly, "Recognizing Advertising Techniques" was identified as important by 46% of teachers but was only taught by 29% of the teachers. "Ethnic Food Patterns was perceived as important only by a minority of teachers (33%) and taught by few teachers (21%). Only 23% of the teachers reported adapting the nutrition curriculum for culturally diverse students (Table 3).

Table 3. Topics of Importance Rating and Topics Taught

Variable	Important (%)	Teaching (%)
From the list below, indicate the nutrition topics you feel are "important" for students at your grade level and indicate the ones you are currently teaching?		
Healthy food choices	67	40
Snacks and fast food	64	46
Nutrients in foods	63	52
Food choice systems (Food Guide Pyramid)	62	56
Sanitation/food handling	59	44
Consumer skills: Label reading	58	49
Preparation of healthy foods	57	38
Weight management	56	37
Eating disorders	53	33
Factors that influence food choices	51	33
Consumer skills: Recognize advertising techniques	46	29
Nutrition for sports performance	45	29
Consumer skills: Ethnic food patterns	33	21

Staff Development and Nutrition Education Resources

Of interest in this study was the degree of nutrition guidance and continuing staff development that nutrition teachers received and their source of nutrition education materials. The majority (52%) of teachers stated that they were not provided with curriculum assistance or a sequence in nutrition to guide their teaching effort by their district or state offices, and only 12% of the teachers reported that they had received staff development in nutrition in the previous year. Although all the schools selected for this study indicated that they were Team Nutrition schools, only 19% of the teachers reported using the Team Nutrition curriculum. Most of the teachers (84%) that used Team Nutrition reported utilizing the *yourSelf* kit designed for middle school use and from this kit, 8% of teachers using *yourSelf* used the "Snack Attack" topic. Additionally, of the teachers using Team Nutrition materials, 32% used them as classroom activities and only one teacher reported initiating cafeteria activities. The American Heart Association educational materials were the most frequently used to teach nutrition by a majority of these teachers (62%), followed by the American Cancer Society (40%), 5-A-Day (30%), and Dairy Council (27%) curriculum.

Teacher's Confidence Level in Teaching Nutrition

Overall, teachers reported high levels of confidence in teaching nutrition-related topics. Almost all teachers (93.2%) were either confident or very confident that they had adequate training to teach nutrition, and understood the concepts well enough to teach them. Most teachers (93.2%) reported they were confident or very confident teaching topics related to the Food Guide Pyramid and a balanced diet (96.5%). Additionally, teachers reported confidence in teaching students to increase fruits and vegetables (95.5%), teaching about fat, sugar, and salt in fast foods

and snack foods (96.5%), and teaching students Dietary Guidelines for Americans (86.4%). The majority (90.9%) of teachers were confident in ability to interest students in the subject of nutrition. Teachers were also confident that if they did a good job teaching nutrition, students' nutrition knowledge would increase (88.6%) and students' nutrition-related attitudes would change (84.1%). A summary of results can be found in Table 4.

Table 4. Teacher Confidence in Providing Nutrition Education (N = 103)

Variable	Not Confident (%)	Confident (%)	Very Confident (%)
How confident are you that :			
You have adequate training to teach nutrition?	3	56	40
You understand nutrition concepts well enough to teach them to your students?	3	54	42
You can do a good job teaching students what the Food Guide Pyramid (FGP) is?	4	38	57
You can do a good job teaching students what food groups make up the FGP?	3	42	54
You can do a good job teaching students about eating a balanced diet?	2	47	51
You can do a good job teaching students which foods belong to each food group in the FGP?	3	39	57
You can do a good job teaching students which nutrients come from each food group in the FGP?	2	41	58
You can do a good job teaching students about fat, sugar, and salt in fast foods and snack foods?	1	48	50
You can do a good job teaching students what the Dietary Guidelines are?	5	49	45
You can do a good job teaching students about reducing fat and salt in their diets?	4	47	49
You can do a good job teaching students about increasing fruits, vegetables, and grains in their diets?	2	50	48

The results of this study confirm previous findings that show almost all teachers are aware that nutrition education is important for middle school children (Perez-Escamilla, 2002). However, the aspects of nutrition that teachers think are most important deserve more consideration. Most teachers (67%) identified "Healthy Food Choices" as an important nutrition topic for seventh grade students, followed by "Snacks and Fast Food" (64%), "Nutrients in Foods" (63%), and "Food Guide Pyramid (67%)." The most commonly taught subject was "Food Guide Pyramid," which was taught by 56% of teachers. Despite the fact that rates of childhood obesity have increased at alarming rates (Koplan et al., 2005), "Weight Management" was reported as important by just over half (56%) of teachers, and only 37% of the teachers reported teaching on the topic. Similarly, although eating disorders are a concern among this age group and are closely related to weight issues, it was perceived as important by just over half (53%) of the teachers and only taught by a third of the teachers (33%). Other nutrition topics not perceived by teachers as important and as a result not frequently taught included "ethnic food patterns", and "recognizing advertising techniques". Without a standardized nutrition curriculum provided to all teachers, an individual teacher's perception of an important topic to teach becomes the determining factor of the topics taught. These results show that nutrition education in the randomly selected schools falls short of the level needed to effect dietary behavior, underscoring the need for a standardized, rigorous, up-to-date, comprehensive school-based nutrition education program, with increased duration and frequency of lessons in order to improve students' dietary behavior as outlined by Suzuki & Rowedder (2002). Faculty from institutions of higher education and members of nutrition professional organizations can play an important role in influencing teachers' perceptions by offering continuing education opportunities in topics of importance as evidenced by current research and public health priorities.

A study by Perez-Escamilla, Haldeman, and Gray (2002) has shown professional development for teachers to be one of the major factors in supporting the implementation of new nutrition curricula. In this study, slightly more than half (52%) of the teachers reported they were not provided with curriculum assistance in nutrition to guide their teaching and only 12% of the teachers reported receiving nutrition related staff development in the past year. In addition to sufficient training, teachers need current and relevant nutrition education resources (Renaud et al., 1997). Through Team Nutrition, USDA has developed resources such as the *yourSelf* Teaching Kit that are based on up-to-date information and can be downloaded at no cost from the USDA website; yet only 19% of teachers reported using these materials.

Several studies indicate that successful implementation of nutrition education programs depends on the importance given to nutrition by the school administration as well as foodservice staff (Kubik, Lytle, Hannan, Story, & Perry, 2002; Levine et al., 2002). A study by Levine et al. (2002) found coordinating classroom nutrition education with cafeteria activities critical to successful nutrition education program implementation, yet only 15% of teachers in the current study reported working with foodservice staff to reinforce classroom instruction. Investigation of strategies that are effective in increasing classroom-cafeteria coordination may be useful. USDA child nutrition programs provide useful information that is most commonly aimed at foodservice directors. Given the lack of communication between foodservice directors and teachers found in this study, it might be beneficial to direct more resources and curricula to classroom teachers.

Although all the schools selected for this study indicated that they were Team Nutrition schools, only 19% of the teachers reported using the Team Nutrition curriculum. The low level of Team Nutrition use found in this study supports findings from a previous Team Nutrition pilot study that indicated teachers used the lesson materials slightly less than two thirds of the recommended times and no more than half of the teachers rated activities as effective in supporting Team Nutrition goals (Levine et al., 2002). In this study, The American Heart Association educational materials were the most frequently used to teach nutrition by a majority of these teachers (62%), followed by the American Cancer Society (40%), 5-A-Day (30%), and Dairy Council (27%) curriculum. Although these resources provide important information related to their area of interest, they may not provide comprehensive nutrition curriculum. USDA's Team Nutrition initiative, in contrast, provides a comprehensive curriculum based on the USDA food guidance system. Since this system is the topic most commonly taught by teachers, it is surprising that USDA Team Nutrition materials are not used more widely. Team Nutrition also employs a comprehensive framework for nutrition education, including ideas for linking classroom and cafeteria. Further investigation of the reasons for this low level of use may be of assistance to USDA in improving the effectiveness of its nutrition education dissemination.

Although this study elucidates important implications for secondary teachers who teach nutrition and related subjects, two major limitations were identified. Generalizability of these results is limited by the fact that participants were derived from one state. The study is also limited by the use of self-reported data. Self–reported behaviors may be biased by social desirability. Although participants reported the frequency of teaching Nutrition in their classrooms, data related to the number of hours spent teaching nutrition was not usable.

CONCLUSIONS

- The USDA Team Nutrition educational initiative has a clear set of intended behavioral outcomes and promotes integration of classroom and cafeteria activities. These learning approaches have been recommended for increasing the effectiveness of nutrition education in promoting healthful dietary behavior. Yet Team Nutrition materials were not widely used in this sample of schools that were self-described as Team Nutrition schools. Reasons for this lack of use should be investigated further and used to improve the effectiveness of USDA school nutrition education activities.
- The lack of communication between food service directors and classroom teachers limits opportunities for Team Nutrition materials from reaching students; perhaps redirection of Team Nutrition materials and outreach from foodservice directors to teachers may promote greater use of Team Nutrition curriculum.
- Ongoing staff development in nutrition and health education appears to be lacking according to the results of this study. This lack of a mechanism for updating nutrition knowledge and nutrition education methods may limit the nutrition topics taught by educators and teaching strategies, making their perception of important topics to teach the only criteria for topics taught.
- Communication between foodservice directors and teachers has a potential of improving health behavior of school children

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