

Abstract

Does Nutrition Education in the Family and Consumer Sciences Classroom Promote Healthy Eating and Exercise Habits?

by Jessica Gray Ficken

May, 2010

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DEPARTMENT OF CHILD DEVELOPMENT AND FAMILY RELATIONS

Many high school students do not practice healthy eating and exercise habits. According to the National Center for Disease Control, 18% of adolescents ages 12-18 are currently overweight (National Institutes of Health, 2006). Many are not aware of consequences associated with unhealthy lifestyles. To improve students' eating and exercise behaviors, students must acquire knowledge, skills, and attitudes associated with healthy practices. One venue for addressing this need is through nutrition education in the Family and Consumer Sciences classroom. The question of this study asks: Does nutrition education in the Family and Consumer Sciences classroom promote healthy eating and exercise behaviors? Findings of this study indicate that an increase in nutritional knowledge alone does not result in immediate changes in attitudes towards nutrition or food consumption behaviors.

KEY WORDS: Nutrition Education; Family and Consumer Sciences Education

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Does Nutrition Education in the Family and Consumer Sciences Classroom Promote Healthy
Eating and Exercise Habits?

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of the Requirements for the Degree

Master's of Education in Family and Consumer Sciences

by

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DOES NUTRITION EDUCATION IN THE FAMILY AND CONSUMER SCIENCES
CLASSROOM PROMOTE HEALTHY EATING AND EXERCISE HABITS?

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CHAPTER 1: INTRODUCTION

Adolescence is a critical developmental juncture of rapid growth and change. Not only is it a time for hanging out with friends and experiencing new things, but also a time for developing healthy eating and exercise habits that will last a life time. Recent studies indicate that healthy eating habits and physical activity lower the risk for overweight and obesity among adolescents (Dodor, 2008). According to the National Institute of Health [NIH], (2006) and Neumark-Sztainer (2006), many adolescents are not following healthy eating and exercise habits. Factors challenging healthy food choices include busy schedules for both adolescents and parents, resulting in consumption of more fast food and highly processed, convenience meals. In addition, fast food restaurants on every corner, vending machines at schools, and not enough safe places for physical activity make it difficult for adolescents to eat healthy meals and be active. Busy schedules also keep families from preparing and eating dinners together (NIH). Lack of nutritional knowledge also accounts for poor eating and exercise habits among adolescents.

The high incidence of poor eating habits and resulting nutritional deficiencies during adolescence is associated with numerous health problems in adulthood, including osteoporosis, obesity, hyperlipidemia, sexual maturation delays and final adult height (NIH, 2006). The most immediate result of poor eating habits is overweight. The NIH estimates that approximately 17.4% of U.S. teens between the ages of 12 and 19 were overweight in 2003 and 2004. Overweight children and teens are at a high risk for developing health problems that adversely impact quality of life. Type 2 diabetes and heart disease once considered as adult diseases, are now being reported in children and teens (NIH). Some researchers predict that if today's

generation does not change their eating and exercise habits, they are more likely to have a shorter life expectancy than their parents (Beck, 2005).

Concerns over poor eating and exercise habits among adolescents and resulting consequences have increased among educators, especially family and consumer sciences professionals who seek to understand the associated factors. Previous studies have examined the relationship between economic costs and overweight (Allison, Zannolli, & Narayan, 1999), as well as the association between parental physical health and parental eating styles with obesity (Whitaker, Deeks, Baughcum, & Specker, 2000).

The purpose of this study is to explore whether students who participate in family and consumer sciences nutrition education in high school show gains in nutrition knowledge, attitudes towards nutrition, and food consumption behaviors. It is estimated that students participating in family and consumer sciences nutrition education will increase eating and exercise practices that support healthy lifestyles.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

There is an enormous amount of research and literature focusing on adolescent knowledge of nutrition as well as eating and exercise habits. Nutrition is a prominent issue in today's overweight, fast food-obsessed and fast-paced society. This chapter focused on previous research in the areas of eating and exercise habits of adolescents and the factors related to such behaviors.

Unhealthy Food Options in America and it's Schools

Many Americans, both young and old, do not abide by nutritional recommendations. About one-quarter of the U.S. population eat fast food everyday (NIH, 2006). What many likely do not realize is that "just one value-sized fast food meal of a sandwich, fries, and sweetened soda can have more calories, fat, and added sugar than anyone should eat in an entire day" (NIH). American children now get about 25% of their total vegetable servings in the form of potato chips and French fries. "Soda and other sugary drinks have replaced milk and water as the drinks of choice for teens and adults alike. Yet these drinks are actually more like desserts because they are high in added sugar and calories. In fact, soda and sugar-laden drinks may contribute to weight problems in kids and teens (NIH).

The policy and practice of many schools in the US does not encourage or support adolescents in making healthy food choices. The School Health Policies and Programs Study [SHPPS] reports that in 2006, 89.4% of high schools had either a vending machine, school store, canteen or snack bar where students could purchase foods or beverages (Center for Disease Control and Prevention [CDC], 2006b). Among the high school surveyed, 48% allowed students to purchase foods and beverages high in fat, sodium, or added sugars, with very few schools offering fruits or vegetables choices. A related study indicates that only 2 of the 50 states

required schools to make fruits or vegetables available to students whenever food is offered or sold (CDC). What is such policy and practice in American schools really teaching adolescents about nutrition?

Influence of Family on Food Choices and Sedentary Lifestyles

Trends in the US indicate that our society is moving towards more sedentary lifestyles. Many factors have contributed to this shift in lifestyles including family work habits, changes in safety, and the availability of technology in the home. Many American children are not getting enough physical activity and have unhealthy eating habits. The National Center for Disease Control reported that 62% of children do not participate in any organized physical activity outside of school hours and 23% do not engage in any type of physical activity during free time. Instead, many young Americans spend their free time sitting in front of televisions and computers. In fact, children in the United States spend an average of 6.5 hours passively consuming media each day. The sedentary habits of many American children are a cause for concern (Balamurugan, 2005).

Recent studies address the many factors contributing to overweight children in America. Eberstat (2003) found that one root cause of the problem stems from absent parents, generally because most mothers in today's society work outside of the home. This conclusion is also supported by the results of the "Maternal Employment and Overweight Children" study, which found a causal relationship between the two factors (Anderson, 2001). Eberstadt blames absent parents for children's excessive television viewing. She suggests this is a problem because people generally eat more while sitting in front of the television than they do sitting at the table. It is also important to note that metabolism slows to almost sleep-like levels after enough time in front of the tube, thereby leading to greater weight gain (Eberstadt).

Eberstadt (2003) also faults absent parents with the lack of exercise and activity level in children as well. She emphasizes that most children are either being housed at an after-school center with many other kids or they are home alone with instructions to stay inside. Most parents do not want their children to play outside while they are not home because many American neighborhoods are not safe anymore. Eberstadt asks, “Who is more likely to gain weight – the child who comes home to a mother telling him to wait for dinner, or the one in an after-school program or empty house with access for hours on end to snack trays and fast food and bulging cupboards and refrigerators?” (Eberstadt, p. 18).

Further research indicates a relationship between family meal patterns and the quality of dietary intake in adolescents. Families who ate more meals together had higher intakes of fruits, vegetables, and essential nutrients and lower intakes of less nutritious foods (Neumark-Sztainer, 2006). This study also found that when families prioritize eating meals together, they are less likely to engage in unhealthful eating and dieting behaviors. Additional research found parental involvement to be related to the likelihood of adolescents eating a healthy breakfast and lunch (Young & Fors, 2001).

Childhood Obesity

American children of all ages are becoming increasingly overweight. The National Health and Nutrition Examination Survey [NHANES] is a longitudinal study, gathering data on the trends in childhood obesity. NHANES data ranging from 1971-2006 shows an increase in the prevalence of overweight school aged adolescents. The prevalence of obesity was higher among Mexican-American adolescent males (22%) than any other demographic. Non-Hispanic black females had the highest prevalence of obesity (28%) compared to that of non-Hispanic white (15%) and Mexican American (20%) females (CDC, 2006a).

Nutritional Knowledge

Research suggests that nutritional knowledge is a necessary factor for changes in consumers behaviors, but not sufficient alone (Moxley & Wimberley, 1982; Worsley, 2002). While knowledge of nutrition alone is no guarantee of behavioral change, it is an important factor contributing to the adoption of a healthy lifestyle. Worsley (2002) found that nutrition education of school children can bring about change in their dietary behavior. With these findings in mind, Worsley poses the idea that if school children learn about nutrition soon enough, diseases and other health conditions associated with poor nutrition can be prevented. This report identifies the need for nutrition education with focus on adolescents in high schools. Societal recognition of the impact that nutrition education can have on the health of adolescents may lead to a healthier future, not a disease stricken future.

It is also important to understand where and how adolescents gain knowledge about nutrition. Thomsen (1988) investigated the frequency in which adolescents receive general nutrition information from a variety of sources and from which of those sources they are most likely to seek information about a specific nutrition topic (Thomsen, 1988). Results indicated that nearly all students reported gaining knowledge of nutrition in a school course during the present or previous years. Home economics, now family and consumer sciences, was most frequently reported, followed by health, sciences and physical education (Thomsen).

Family and Consumer Sciences Education

The *National Standards for Family and Consumer Sciences Education* (NASAFACS, 2009) identify knowledge, skills, and dispositions associated with the discipline, guiding curriculum development for secondary level programs. Included in this document is the following Comprehensive and Content Standards related to Nutrition and Wellness:

14.0 Analyze factors that influence nutrition and wellness practices across the life span,

14.1 Evaluate the nutritional needs of individuals and families in relation to health and wellness across the life span.

14.2 Demonstrate ability to acquire, handle, and use foods to meet nutrition and wellness needs of individuals and families across the life span.

North Carolina's Department of Public Instruction, Division of Career and Technical Education, has extensively developed coursework in Family and Consumer Sciences education. One such course, Teen Living offers an entire unit on fitness, nutrition and food selection and preparation. Within this unit, the factors that affect fitness are addressed including benefits and components of fitness, weight management, and eating disorders. Personal eating habits are also analyzed with respect to influences on food choices, nutrient functions and sources, the food guide pyramid, dietary guidelines for Americans, healthy food choices and vegetarian diets. A section covers special dietary needs such as medical diets, sports nutrition and dietary needs during the various stages of life. The second half of this unit focuses on food selection, preparation, and service. Food selection practices addressed include nutrition and appeal. Safety and sanitation involving food storage, food handling and food-borne illnesses are covered, as well as safety precautions and first aid. Finally, food preparation skills are taught with an emphasis on using equipment, reading recipes, measuring techniques and food etiquette.

There has been a wealth of research conducted concerning the effects of nutrition education on human behaviors. One such study found that high school students completing a nutrition course not only increased nutritional knowledge, but also showed gains in positive attitudes toward nutrition and food consumption behaviors (Watson, 2006). A similar study found that an increase in nutritional knowledge lead to positive changes in dietary practices

among participants (Green, 1991). Findings of such studies indicate the importance and potential health benefits of education programs focused on food, nutrition, and lifestyle management in secondary schools, thereby supporting improved health outcomes in adolescence and adulthood.

Conclusion

Various factors influencing adolescent eating habits have been examined with families and schools identified as being most influential. Findings suggest that many parents and adult caregivers lack awareness or consideration of nutritional value in providing meals for their family. Schools also are “enablers” by allowing unhealthy snacks and beverages to be sold on campus. Other factors affecting adolescent nutrition include the absence of parents during non-school hours, contributing to increased television viewing and decreased exercise and activity. Research also indicates that families no longer eating meals together contributes to unhealthy eating habits. Such practices in adolescence clearly affect those of one’s adult life. It is evident that poor eating habits are problematic in the lives of American adolescents, with parents and schools largely enabling the problem to continue. Research suggests that nutrition education may hold promise in addressing this problem to affect positive outcomes for American adolescents, families and society.

CHAPTER 3: METHODOLOGY

Purpose and Research Questions

The purpose of this study was to investigate whether nutrition knowledge gained in family and consumer sciences courses encouraged individuals to develop healthy eating and exercise behaviors. Specific objectives were (a) to assess the nutritional knowledge, attitudes, and food consumption behaviors of high school students in the treatment and control groups before and after the intervention and (b) to evaluate the effectiveness of nutrition education on improving the overall nutrition knowledge, attitudes, and food consumption behaviors of the student by comparing data collected before and after the intervention and between treatment and control groups.

Variables

The independent variable or treatment of this study is nutrition education. The dependent variables are eating habits and exercise behaviors.

Methods

The sample group for this study consists of forty-six (46) students, enrolled in grades 9 – 12 in an eastern North Carolina high school. Thirty-one (31) of the students are enrolled in the course Teen Living and served as the treatment group. Participants attended Teen Living 5 days a week for 90 minutes each day. During the course, they received nutrition education as the intervention of this study for approximately four weeks during their regular class period, taught by their instructor. Fifteen (15) students enrolled in a Housing and Interiors I course served as the control group.

Instrument

A standardized instrument was used to collect data for this study. The questionnaire was designed to collect background information, nutrition knowledge, students' attitudes towards nutrition, and food consumption behaviors. Background information included age, gender, race/ethnicity, and completion of a previous nutrition course. In addition, questions regarding reasons for enrollment in the course, personal weight perception, and physical activity data were included in the questionnaire (Watson 2006). Fifteen questionnaire items solicited information regarding participant's nutrition knowledge. A cumulative score was determined based on responses to nutrition knowledge items. Participant's food consumption habits were determined based on their responses to eight questionnaire items. Each food consumption response was compared from the pretest and posttest. Participant's attitudes towards nutrition was identified based on their responses to ten items, the responses to each of these items were compared from the pretest and posttest.

Data Collection

Using school assigned student identification numbers participants completed the pretest survey. This survey was completed before the unit regarding fitness, nutrition and foods as part of the Teen Living course. After completion of this unit, the posttest were administered.

Data Analyses

Descriptive statistics summarized participant characteristics with respect to gender, race/ethnicity, perceived weight, and exercise habits. Independent and paired T-tests were applied to analyze pretest and posttest data. Independent *t*-tests were used to compare the mean scores of the knowledge-based, attitude, and food consumption questions between the treatment and control groups. Paired *t*-tests were applied to determine if there were any changes between

treatment and control groups in nutritional knowledge, attitudes towards nutrition, or food consumption behaviors that occurred following the intervention.

Each knowledge-based question was assigned a binomial value of either 0 or 1; 0 for an incorrect answer and 1 for a correct response. A continual variable was then created to assess the sum of knowledge with a maximum value of 15. A series of T-tests were conducted to determine the mean scores and standard deviations. Mean scores were compared between pre- and posttest results of treatment and control groups.

Students used a Likert-type scale to answer attitude-based questions. The scale ranged from 5 to 1 with a score of 5 representing *strongly agree* and 1 representing *strongly disagree*. Standard deviations and mean scores were calculated through a series of T-tests and then compared between pre- and posttest results of both treatment and control groups.

Questions assessing food consumption behavior patterns were recorded in the following manner: “I did not eat any servings of the foods listed above” (1); “I ate one of these foods 1 time yesterday” (2); “I ate one of these foods 2 times yesterday” (3); and “I ate one of these foods 3 or more times yesterday” (4). A series of independent and paired T-tests were conducted to compare groups 1 and 2 pre- and posttest scores, as well as determining if a change occurred between the two measurements.

CHAPTER 4: RESULTS

Background and Student Characteristics

A total of 46 adolescent high school students (31 in the intervention group and 15 in the control group) participated in the study, ranging in age from 14 and 18 years old. Gender representation was predominantly female, with only 32% male participants in the treatment group and no male participants in the control group.

As listed in Table 1, students in the treatment group were predominantly non-Hispanic black or African American (71%), with the control group distributed more equally among non-Hispanic Black or African American (53%) and non-Hispanic white or Caucasian (47%).

A strong majority (71%) of treatment group participants perceived their own weight as being normal, with 13% reported as being overweight. Similar measures were reported in the control group, with 73% reported as being normal weight and 13% as overweight.

Nearly half (48%) in the treatment group reported exercising 30 minutes or less per week, with 23% reporting that they exercise more than 120 minutes per week. Again, somewhat similar measures were reported in the control group, with one-third (33%) reporting that they exercise 30 minutes or less per week and 27% reporting that they exercise more than 120 minutes per week.

Six of the 31 students in the treatment group had previously completed courses in Foods and Nutrition I, with nearly half (48%) completing Physical Education I that includes a unit on nutrition and wellness. A higher percentage of students (72%) in the control group reported prior course work in nutrition education. Ten of the 15 students in the control group had previously completed Foods and Nutrition I, with five also having taken Foods and Nutrition II. A strong majority of students in the control group (73%) also reported completing Physical Education I,

which again, includes instruction on nutrition and wellness. Ten students in the treatment group and four in the control group reported they had never taken a course about nutrition.

Table 1.

Participant Characteristics

Characteristics	<u>Treatment Group</u> (n = 31)	<u>Control Group</u> (n = 15)
<u>Gender</u>		
Male	32%	0%
Female	68%	100%
<u>Race/ethnicity</u>		
Mexican American	3%	0%
Native American	0%	0%
Non-Hispanic Black	71%	53%
Non-Hispanic White	20%	47%
Other Hispanic	3%	0%
Other	3%	0%
<u>Perceived weight</u>		
Below normal weight	3%	13%
Normal weight	71%	73%
Overweight	13%	13%
I don't know	13%	7%
<u>Exercise length (per week)</u>		
None	13%	13%
At least 30 minutes	35%	20%
At least 60 minutes	13%	13%
At least 90 minutes	10%	7%
At least 120 minutes	6%	20%
More than 120 minutes	23%	27%

Nutrition Knowledge

A comparison of pretest mean scores for nutrition knowledge showed no significant difference between treatment and control groups ($p > .05$). Following the intervention, independent t tests revealed a significant difference ($t = 2.7, p > .01$) in nutritional knowledge

between the treatment and control groups. Paired sample *t* tests further revealed that the participants in the treatment group showed a significant increase in posttest knowledge ($M = 9.32$, $SD = 2.2$, $t = 2.7$, $p > .01$), however, the control group did not ($M = 7.3$, $SD = 2.49$).

Attitudes

Independent *t* tests compared the means and standard deviations of participant's pretest attitudes towards nutrition with no significant difference found between treatment and control groups ($p > .05$). Following the intervention, a paired sample *t* test revealed that students' overall attitudes towards nutrition did not change ($p > .05$).

Food Consumption

Independent *t* tests compared the food consumption behaviors of the participants. Pretest results indicated no significant difference between the treatment and control groups ($p > .05$). Although several differences were found when comparing the treatment and control group's food consumption behaviors, there were no significant changes found between the pre and posttests. ($p > .05$).

TABLE 2.

Nutrition Knowledge, Attitudes Towards Nutrition and Food Consumption

	<u>Treatment (n = 31)</u>				<u>Control (n =15)</u>			
	<u>Pretest</u>		<u>Posttest</u>		<u>Pretest</u>		<u>Posttest</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Nutrition Knowledge	6.2	2.5	**7.8	2.3	9.3	2.2	7.3	2.5
Attitudes	3.9	1.0	3.7	1.4	4.2	0.9	3.6	1.5
	2.8	1.3	2.6	1.6	3.0	1.2	2.6	1.5
	4.0	1.1	4.1	1.0	3.8	1.1	3.9	1.1
	4.4	0.8	4.7	0.6	4.2	1.1	4.3	1.0
	3.0	1.1	2.9	1.4	3.1	1.1	2.9	1.2
	2.1	1.3	2.1	1.5	2.7	1.4	1.9	1.3
	2.6	1.2	2.1	1.0	2.7	1.3	2.1	1.0
	4.3	0.9	4.3	0.9	4.3	1.0	4.3	0.8
	2.7	1.5	2.7	1.0	2.3	1.4	2.7	1.1
	1.7	1.1	1.4	0.6	1.9	1.4	1.8	1.3
Food Consumption	1.7	0.9	3.9	0.4	1.8	0.7	3.6	0.5
	1.6	0.6	1.5	0.5	1.6	0.9	1.5	0.7
	1.7	0.9	3.1	1.0	1.8	0.9	3.4	0.8
	1.8	0.9	3.4	0.7	1.9	0.8	3.5	0.6
	1.3	0.5	3.3	1.0	1.6	0.9	3.4	1.0
	1.2	0.4	1.1	0.3	1.2	0.4	0.3	0.6
	1.5	0.8	1.6	0.6	1.6	0.7	1.8	0.6

NOTE: M = mean score; SD = standard deviation; ** p >.01.

CHAPTER 5: DISCUSSION AND CONCLUSION

Discussion

This study was designed to evaluate whether a nutrition-related course would improve adolescents' nutritional knowledge and positively change their attitudes towards nutrition and their food consumption behaviors. The findings of this study indicate that an increase in nutritional knowledge may not necessarily lead to immediate changes in eating or exercise habits. Although these were not the anticipated results of the study, the importance of nutritional knowledge as a key factor in changing dietary behavior should be noted (Moxley & Wimberley, 1982; Worsley, 2002).

In most secondary public schools, students have the option of taking various Family and Consumer Sciences courses. Several of these courses either focus on or address personal nutritional needs. These courses include Teen Living, Parenting and Child Development, Foods and Nutrition I and Foods and Nutrition II. This study begins to examine the importance of Family and Consumer Sciences courses in schools today. Participating in such courses may be the only opportunity for some students to learn about nutrition to support taking better care of themselves and their families in the future.

Limitations

One limitation of this study was that it utilized a sample of convenience. The students were not randomly assigned to a group and the groups were not equally distributed based on age, race, gender or previous experiences. The inability to randomly assign the groups makes the results of this study difficult to generalize to other high school students. These results also cannot be generalized to other nutrition related courses because of a difference in curriculum, instructors, and teaching methods.

Another limitation of this study was the manner in which food consumption behavior was determined. Students completing the questionnaire were asked to provide only a one-day food

recall. This is a limitation due to likely variation of dietary behaviors from day-to-day. Instead, a longitudinal approach to this question of the study would provide more valid and reliable data.

The questionnaire items concerning participants' exercise behaviors are inconsistent. While one question asks for data in week, another asks for response in terms of days. The question should be revised to ask how much exercise a person gets each day in order to provide consistency and reduce confusion. Due to the discrepancy with this question, exercise data collected was inaccurate, therefore not reported.

The final limitation of this study was the length of time between the intervention and the posttest. A few weeks may not be an adequate length of time to show evidence of a behavior change. Instead, a longer period of time between the intervention and final data collection may result in more favorable outcomes.

Conclusion

The findings in this study indicate that an increase in nutritional knowledge may not necessarily lead to immediate changes in eating or exercise habits. Although an increase in nutritional knowledge alone may not immediately lead to a behavioral change, individuals must first know about nutritional needs before they can make informed decisions to lead a healthy life. Nutrition education is important, yet overlooked aspect of secondary education. The results of this study demonstrate the potential of nutrition education to help students learn about nutritional needs and how their food choices can affect their bodies, immediately and in the future.

Recommendations for Future Research

Future research is recommended with several suggested changes in order to provide more sufficient results. A larger sample is needed which should be selected randomly from several different locations, rather than just one school. The participants would need to receive the same intervention even though they are at different locations. This poses a challenge due to constraints

in public school settings for random selection of students. Many classes that offer nutrition education are elective courses, not mandatory with students divided into groups based on class registration.

The course Foods and Nutrition I would be a more appropriate intervention than Teen Living because it is a semester long course that has more in-depth nutritional objectives. Teen Living's nutrition unit is much shorter and less in-depth. Finally utilizing a different instrument would also provide more sufficient results. The instrument should more appropriately measure student's habits, rather than relying on a teenager's memory to answer questions, daily food and exercise logs would be a more appropriate method to gather this information. A replication of this study in a Foods and Nutrition course, focusing on students at several locations and an up-dated instrument would increase the potential for more sufficient results about the effects of nutrition education on adolescent eating and exercise behavior.

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APPENDIX A: [Institutional Review Board Approval Letter]



University and Medical Center Institutional Review Board
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TO: Jessica Ficken, 202 Jacob's Ridge Dr., Goldsboro, NC 27534

FROM: UMCIRB *kk*

DATE: October 21, 2009

RE: Expedited Category Research Study

TITLE: "Does nutrition education in the Family and Consumer Sciences classroom promote healthy eating and exercise habits?"

UMCIRB #09-0736

This research study has undergone review and approval using expedited review on 10.21.09. This research study is eligible for review under an expedited category because it is a research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.). The Chairperson (or designee) deemed this **unfunded** study **no more than minimal risk** requiring a continuing review in **12 months**. Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

The above referenced research study has been given approval for the period of 10.21.09 to 10.20.10. The approval includes the following items:

- o Internal Processing Form (dated 9.18.09)
- o Letter of Support (dated 9.25.09)
- o Parental Permission Form (received 10.19.09)
- o Minor Assent (received 10.20.09)
- o Survey: Pre & Post Intervention
- o Attitude Towards Nutrition

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

The UMCIRB applies 45 CFR 46, Subparts A-D, to all research reviewed by the UMCIRB regardless of the funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies under the Food and Drug Administration regulation. The UMCIRB follows applicable International Conference on Harmonisation Good Clinical Practice guidelines.

APPENDIX B: [Research Instrument]

Student's ID_____

**Evaluation of the Knowledge, Attitudes, and Behaviors of Students Before and After Completion of
a High School Nutrition Course**

Intervention

Fall 2009

Participation is voluntary. Inclination to participation or your responses do NOT affect your course grade. Also, you must have returned a parent's signed consent form in order to complete this questionnaire.

Section I. Background Information

Tell us about yourself.

1) How old are you? _____ Years

2) What is your gender?

_____ Male _____ Female

3) Which of the following choices best describes your race or ethnicity? Circle only one.

1) Asian or Pacific Islander

2) Mexican American

3) Native American

4) Non-Hispanic Black or African American

5) Non-Hispanic White or Caucasian

6) Other Hispanic

7) Other please specify _____

4) Have you previously taken another nutrition class?

_____ Yes _____ No

If yes, what course: _____ Foods and Nutrition I

_____ Foods and Nutrition II

_____ Physical Education 1 (9th grade P.E.)

5) Why did you enroll for Nutrition & Food Science or Sports Nutrition? Circle only one that describes your situation BEST.

- 1) I am interested in learning about nutrition.
- 2) I am interested in learning about health and wellness.
- 3) It sounds interesting.
- 4) I need an elective course.
- 5) I am required to take this course.
- 6) Other please specify_____

6) I think my weight is:

- 1) Below normal weight
- 2) Normal weight
- 3) Overweight
- 4) I don't know

7) In weekly total, how long do you exercise each week?

- 1) None.
- 2) For at least 30 minutes a week
- 3) For at least 60 minutes a week
- 4) For at least 90 minutes a week
- 5) For at least 120 minutes a week
- 6) More than 120 minutes a week

8) What type(s) of exercise do you do each week? Please circle all that apply.

- 1) Sports (e.g. football, basketball, tennis)
- 2) Cheerleading/Drill Team/Dancing
- 3) Aerobic exercise (e.g. running, walking, elliptical machine)
- 4) Anaerobic exercise (e.g. weight lifting)
- 5) Other please specify_____

Section II. Food Selection

This section is for your food selections and eating patterns. Please read each question and choose the answer that best applies to you.

1) Yesterday, did you eat hamburger meat, hot dogs, sausage (chorizo), steak, bacon, or ribs?

- 1) No, I didn't eat any of the foods listed above yesterday.
- 2) Yes, I ate one of these foods 1 time yesterday.
- 3) Yes, I ate one of these foods 2 times yesterday.
- 4) Yes, I ate one of these foods 3 or more times yesterday.

2) Yesterday, did you eat any fried meat with a crust, like fried chicken, chicken nuggets, chicken fried steak, fried pork chops, or fried fish?

- 1) No, I didn't eat any of the foods listed above yesterday.
- 2) Yes, I ate one of these foods 1 time yesterday.
- 3) Yes, I ate one of these foods 2 times yesterday.
- 4) Yes, I ate one of these foods 3 or more times yesterday.

3) Yesterday, did you drink any kind of milk?

Count chocolate milk, milk on cereal, or drinks made with milk.

- 1) No, I didn't drink any of the foods listed above yesterday.
- 2) Yes, I drank one of these foods 1 time yesterday.
- 3) Yes, I drank one of these foods 2 times yesterday.
- 4) Yes, I drank one of these foods 3 or more times yesterday.

4) Yesterday, did you eat any vegetables?

Vegetables are salad; boiled, baked and mashed potatoes; and all cooked and uncooked vegetables. Do not count french fries or chips.

- 1) No, I didn't eat any of the foods listed above yesterday.
- 2) Yes, I ate one of these foods 1 time yesterday.
- 3) Yes, I ate one of these foods 2 times yesterday.
- 4) Yes, I ate one of these foods 3 or more times yesterday.

5) Yesterday, did you eat fruit? Do not count fruit juice?

- 1) No, I didn't eat any of the foods listed above yesterday.
- 2) Yes, I ate one of these foods 1 time yesterday.
- 3) Yes, I ate one of these foods 2 times yesterday.
- 4) Yes, I ate one of these foods 3 or more times yesterday.

6) Yesterday, did you eat a frozen dessert?

A frozen dessert is a cold sweet food like ice cream, frozen yogurt, an ice cream treat, or a popsicle.

- 1) No, I didn't eat any of the foods listed above yesterday.
- 2) Yes, I ate one of these foods 1 time yesterday.
- 3) Yes, I ate one of these foods 2 times yesterday.
- 4) Yes, I ate one of these foods 3 or more times yesterday.

7) Yesterday, did you eat sweet rolls, doughnuts, cookies, brownies, pies, or cake?

- 1) No, I didn't eat any of the foods listed above yesterday.
- 2) Yes, I ate one of these foods 1 time yesterday.
- 3) Yes, I ate one of these foods 2 times yesterday.
- 4) Yes, I ate one of these foods 3 or more times yesterday.

8) Yesterday, did you eat breakfast?

Yes No

9) Yesterday, did you have a snack? A snack is a food or drink that you eat or drink before, after, or between meals.

- 1) No, I didn't have any snacks yesterday.
- 2) Yes, I had a snack 1 time yesterday.
- 3) Yes, I had a snack 2 times yesterday.
- 4) Yes, I had a snack 3 or more times yesterday.

If you eat snacks, please choose the five (5) most frequently eaten snacks from the following list AND RANK them from one (1) being the MOST frequently eaten to five (5) being the LEAST frequently eaten.

- ____ Potato or corn chips
- ____ Carrot or celery sticks
- ____ Fresh fruits
- ____ Dry or canned fruits
- ____ Ice cream or sherbet
- ____ Yogurt
- ____ Pretzels or popcorn
- ____ Sweets such as cookies, candies, and chocolates
- ____ Cereal bars
- ____ Nuts or trail mixes
- ____ Crackers and cheese or peanut butter
- ____ Energy drinks or smoothies
- ____ Sodas
- ____ Milk
- ____ Other please specify _____

10) How often do you eat away from home other than school meals?

- 1) Never
- 2) Once a week
- 3) Twice a week
- 4) Three times a week
- 5) Four or more times a week

11) Of those, how many times do you eat at a fast food restaurant (e.g. McDonalds, Wendy's, Taco Bell, etc.)?

- 1) Never
- 2) Once a week
- 3) Twice a week
- 4) Three times a week
- 5) Four or more times a week

Section III. Nutrition Knowledge

Please read each question and choose the ONE correct answer.

***Food Guide Pyramid:** The Food Guide Pyramid is separated by food groups and is designed to help individuals understand the Dietary Guidelines.

1) How many sections are in the Food Guide Pyramid?

- 1) 4
- 2) 5
- 3) 6
- 4) 7
- 5) Don't know

2) Circle all the categories that are found on the Food Guide Pyramid

- 1) Grains
- 2) Water
- 3) Fruits
- 4) Vegetables
- 5) Milk
- 6) Meat and beans
- 7) Oils
- 8) Sweets
- 9) Don't know

***Dietary Guidelines:** The Dietary Guidelines are designed for individuals who are age 2 or older. They provide dietary habit recommendations that can promote health and lower the risk of developing chronic diseases.

3) According to the Dietary Guidelines, how many servings of dairy (milk, cheese, yogurt, etc.)

should an individual on a 2,000 kcal diet consume each day?

- 1) 1
- 2) 2
- 3) 3
- 4) 4
- 5) 5
- 6) Don't know

- 4) According to the Dietary Guidelines, how many servings of fruits and vegetables should an individual on a 2,000 kcal diet consume each day?
- 1) 3
 - 2) 4
 - 3) 5
 - 4) 6
 - 5) 7
 - 6) Don't know
- 5) What is the minimum amount of water that an individual needs each day?
- 1) 6 glasses (1.5 qt.)
 - 2) 8 glasses (2 qt.)
 - 3) 10 glasses (2.5 qt.)
 - 4) 12 glasses (3 qt.)
 - 5) Don't know
- 6) Which of the following is not considered as a major nutrient category?
- 1) Protein
 - 2) Enzymes
 - 3) Vitamins
 - 4) Minerals
 - 5) Don't know
- 7) Which nutrient contains the most calories per gram?
- 1) Carbohydrate
 - 2) Fat
 - 3) Protein
 - 4) Mineral
 - 5) Don't know

- 8) The major function of _____ (name of nutrient) is to provide the body with energy.
- 1) Carbohydrate
 - 2) Fat
 - 3) Protein
 - 4) Vitamins
 - 5) Don't know
- 9) Which mineral is responsible for maintaining bone health?
- 1) Potassium
 - 2) Magnesium
 - 3) Calcium
 - 4) Phosphorous
 - 5) Don't know
- 10) If an individual has an increased amount of _____ and _____ in their diet, they will increase their chance developing heart disease.
- 1) Fat and protein
 - 2) Carbohydrates and fat
 - 3) Cholesterol and carbohydrates
 - 4) Fat and cholesterol
 - 5) Don't know
- 11) Which choice would provide the most healthful diet?
- 1) High in fruits, vegetables, and milk
 - 2) High in fats, fruits, vegetables, and milk
 - 3) High in fruits and vegetables, low in milk
 - 4) Low in fruits, vegetables, and milk
 - 5) Don't know

- 12) How can an individual achieve a healthy weight?
- 1) By balancing the amount of energy taken in and out of the body.
 - 2) By eating a healthy and balanced diet.
 - 3) By exercising thirty minutes a day 4-5 times a week.
 - 4) By only eating organic foods
 - 5) Don't know
- 13) According to Dietary Guidelines how many minutes a day should teenagers and adults participate in moderate physical activity?
- 1) 20 minutes
 - 2) 30 minutes
 - 3) 45 minutes
 - 4) 60 minutes
 - 5) Don't know
- 14) Which of the following is the most balanced snack choice for teenagers?
- 1) Cheese crackers and soda
 - 2) Milk and cookies
 - 3) Carrot sticks, salad, water
 - 4) Cheese crackers, carrot sticks, water
 - 5) Don't know
- 15) Which of the following is the most balanced meal choice for teenagers?
- 1) Milk, French fries, hamburger
 - 2) Chicken breast, broccoli, carrots, water
 - 3) Bean burrito, rice, water
 - 4) Caesar salad and water
 - 5) Don't know

Section IV. Attitude towards nutrition

Please circle the response that expresses how much you agree or disagree with the following statements. 1 = strongly disagree, 2 = somewhat disagree, 3 = neutral/undecided, 4 = somewhat agree, 5 = strongly agree

	Strongly Agree	Somewhat Agree	Neutral/ Undecided	Somewhat Disagree	Strongly Disagree
1) I'm very interested in nutrition and health.	5	4	3	2	1
2) My family has health problems that increased my interest in nutrition.	5	4	3	2	1
3) I want to improve my nutritional habits.	5	4	3	2	1
4) What I choose to eat now will have an impact on my health as a teenager and an adult.	5	4	3	2	1
5) I think I make good food choices.	5	4	3	2	1
6) I choose foods based on price.	5	4	3	2	1
7) I choose foods based on nutritional content.	5	4	3	2	1
8) I choose foods based on taste.	5	4	3	2	1
9) I choose foods based on what my parent(s) or guardian(s) eat.	5	4	3	2	1
10) What my friends think of me is more important than making good choices for my health.	5	4	3	2	1