

## Adolescent's Nutrition Knowledge

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### Abstract

The growing concern for poor dietary habits among adolescents has prompted many researcher to study the adolescents' knowledge and beliefs on a number of nutrition-related issues. Following that precedent, this study was conducted to evaluate the nutrition knowledge of a sample of adolescents in a middle school in Ohio. The participants were 532 students in the sixth, seventh, and eighth grades between the ages of 11 and 13 from Shawnee Middle School in Lima, Ohio. The students were asked to answer a questionnaire CANKAP (Comprehensive Assessment of Nutrition Knowledge, Attitudes, and Practices), which measured their nutrition knowledge. The CANKAP questionnaire consisted of 20 questions for sixth grade students and 25 questions for seventh and eighth grade students. Also, the participants were asked to identify their gender. According to the result, nutrition knowledge of middle school children was weak. The findings indicated that females had higher mean nutrition knowledge scores than boys in the seventh and eighth grades. There was no significant difference in the mean value of nutrition knowledge between sixth grade boys and girls.

**Key words:** nutrition, adolescents, knowledge

### INTRODUCTION

During adolescence, the energy and nutrient intakes needed to sustain the physical changes vary widely, but, in general, the adolescents themselves are not interested in nutrition, and surely not in the long range benefits of good nutritional habits. Because of poor eating habits among many adolescents, some researchers have conducted studies to explore different factors influencing adolescents eating behavior. Researchers acknowledge that a wide variety of factors influence adolescents' eating behavior. In addition to nutrition knowledge, factors that could influence an adolescent's food choices are: physiological needs, body image, food preferences, parental practices, peers, media, social norms, fast foods, and personal experiences (1-6). Nutrition knowledge has been shown to have a positive impact in the selection of healthy foods (7). Therefore, nutrition knowledge was chosen for investigation in this research project. Because of possible reluctance among students to reveal their age or parent's education, the variables such as age or social class, are not considered in this research project. The findings from this research will add to the limited research data currently defining the nutrition knowledge of middle school students. This study had the following objective: to measure the nutrition knowledge of middle school children based on gender.

### MATERIALS AND METHODS

#### Participants

Participants in this study consisted of 532 middle school students from Shawnee Middle School in Lima, Ohio. The Shawnee Middle School had been randomly selected. There are 13 private and public schools in Lima, Ohio. Each school name was written on a piece of paper, and they were put in a box. The box was shaken to mix up the names of schools, and then one school name was drawn at random. The Shawnee Middle School is a public school. The total enrollment of 6th, 7th, and 8th graders was 594. The age group for 6th grade students is 10~11, 7th graders 11~12, and 8th graders 12~13. A total of 532 students volunteered to complete the questionnaire. The Shawnee Middle school services all of the middle school students who reside in Shawnee Township. Shawnee township is considered to be a high income level community (median family income is \$43,596 compared to the city of Lima \$25,775) (8). Also, Shawnee residents have a higher educational background (87.5% are high school graduates or higher than the residents of the city of Lima (69.3%) (8). Permission to conduct this research had been granted by the principal of the school and approved by the BGSU (Bowling Green State University) human subjects committee.

### Instrument

The instrument selected to measure the identified variable; nutrition knowledge was a written measure of nutritional knowledge, called the CANKAP (9). Content validity of the instrument was determined by several methods (10). First, the researchers plotted the distribution of items by goals and objectives in relation to the development level and / or subject matter. Second, professionals in the field of nutrition and food science, education, and human development reviewed the instrument. Third, a reading specialist evaluated the instrument for its level of readability. Reliability indices for all scales were computed, and an item analysis was conducted for all items testing nutrition knowledge (10). Each knowledge scale was determined to have a Cronbach's alpha reliability coefficient of 0.70 or greater, which is considered acceptable in this type of research.

The test CANKAP consisted of different forms for measuring nutrition knowledge for each different grade level in schools. This makes it especially suitable for the purpose of this research.

The CANKAP questionnaire was administered to the participants during language art classes. This test was written for and tested at the appropriate grade level; the 4~6 grade CANKAP test was used with the Shawnee sixth grade, and the 7~9 grade CANKAP test was administered to the seventh and eighth grade students. The CANKAP questionnaire consisted of 20 questions for the sixth graders, which measured nutrition knowledge. The questionnaire for seventh and eighth graders contained 25 questions, which measured nutrition knowledge. In addition, there was one question which identified the student's gender. Example of an item used to measure nutrition knowledge is: - Which of these foods contains the most protein? 1. baked sweet potato 2. fresh tomato 3.

roast turkey 4. steamed rice

The knowledge questions used a multiple-choice format with four choices. The knowledge questions were scored by giving one point for the "best response" to the question. No penalty was imposed for choosing an incorrect response. The total number of best responses was, therefore, the student's score.

### Data analysis

Answers from the questionnaires were coded and transferred to computer scan sheets. The collected data were statistically analyzed using SAS (Statistical Analysis System). Means and standard deviations for the knowledge were calculated by gender. One-way analysis of variance was used to test for significant differences between scores of specific groups of students based on gender. Also, nutrition knowledge was analyzed by multiple regression using the independent variable of gender.

## RESULTS

The overall mean score on the knowledge portion of the questionnaire completed by 178 sixth grade students was 13.7 out of a possible score of 20 points (Table 1). Out of a possible score of 25 points, the over-all mean score on knowledge questions was 11.80 for seventh graders and 11.5 for eighth graders (Table 1).

Using one-way analysis of variance, it was found that there was no significant difference in the mean value of nutrition knowledge between sixth grade boys (13.40) and girls (13.96) ( $F_{1,174}=1.03$ ,  $P=0.3127$ ). However, the results from one-way analysis of variance indicated that the mean nutrition knowledge scores of seventh and eighth grades girls (12.35) were significantly higher than boys (10.86) ( $F_{1,339}=17.88$ ,  $P=0.0001$ ) (Table 2). Seventh and eighth graders showed the largest difference between boys and

**Table 1.** Nutrition knowledge scores of sixth, seventh and eighth grade students using CANKAP test

	N	Mean	SD	Low possible 0	High
6th, Total	178	13.68	3.70	2	20/20
6th, Male	80	13.40	4.23	2	20/20
6th, Female	96	13.96	3.21	2	20/20
7 <sup>th</sup> , Total	150	11.80	3.24	4	19/25
8 <sup>th</sup> , Total	191	11.55	3.39	2	19/25
7 <sup>th</sup> &8 <sup>th</sup> , Male	158	10.86	3.45	2	19/25
7 <sup>th</sup> &8 <sup>th</sup> , Female	183	12.35	3.05	4	19/25

**Table 2.** The significance of gender differences

Grade	Number	F	P	Mean
Sixth graders Boys & Girls	178	$F_{1,174}=1.03$	0.3127	Boys=13.40 Girls=13.96
7 <sup>th</sup> & 8 <sup>th</sup> graders Boys & Girls	354	$F_{1,339}=17.88$	0.0001	Boys=10.86 Girls=12.35

girls.

The knowledge scores of the sixth grade students were analyzed by multiple regression using independent variable of gender (Table 3). It was found that gender was not a significant predictor of nutrition knowledge in the sixth grade volunteer subjects ( $F=0.44$ ,  $P=0.5078$ ). The scores of the seventh and eighth grade students on the knowledge section were evaluated by multiple regression, using the independent variable of gender (Table 3). The data showed that the variable of gender was a significant predictor of nutrition knowledge ( $F=11.74$ ,  $P=0.0007$ ).

## DISCUSSION

One factor that could have an impact on nutrition knowledge is nutrition education (10-15, &7). Educational background has been shown to have a positive impact in the selection of healthy foods. A comparison between two groups of university students in different educational disciplines indicated that students majoring in basic nutrition scored higher on a test for knowledge of nutrition than did the physical education majors (14). A total sample of 398 adolescents, ages 14 to 18, participated in health fairs sponsored in cooperation with their high school health classes (15). The students completed a questionnaire on their compliance with six of the US Dietary Guidelines. The findings suggested that the adolescents reported the highest compliance on "eat a variety of foods" and "eat foods with adequate starch and fiber". These data supported the conclusion that education is important for having more knowledge about nutrition.

There was no significant difference in the mean value of nutrition knowledge between sixth grade boys and girls. These findings disagreed with the results from Halverson's (1987) study. Halverson (10) measured nutrition knowledge of 275 sixth grade students from West Virginia using CANKAP questionnaires and indicated that girls had higher mean knowledge scores than boys. The difference between the results from current study and Halverson's study could be due to the differences in geographical locations. A possible explanation for the findings from seventh and eighth grade boys and girls is that since girls tend to be more preoccupied with their looks at an earlier age than boys, more concern for weight seems a logical outgrowth of that preoccupation (16). That con-

cern would, in turn, motivate girls to search for more knowledge about nutrition. The same CANKAP questionnaire was used in a study with a sample of students in Tennessee. The mean knowledge score of fourth through sixth grade was 10.8 or 54.0 percent of the possible score (17). Another study used Nutrition achievement Test (NAT) to measure nutrition knowledge of 515 sixth grade students from rural and urban Illinois (18). The mean score for nutrition knowledge was 52 percent correct responses. The group of students from Shawnee Middle School in the current study are similar to the West Virginia sample in their achieved scores.

### The most weakness points in adolescent's nutrition knowledge

*Sixth graders* : When nutrition knowledge questions of sixth graders were analyzed, findings showed that students were not informed about the functions and sources of nutrients or energy. One question which measured their knowledge about nutrients sources indicated that only 31 percent knew that turkey contained protein, but another 30 percent identified a fresh tomato as a source of protein, while 24 percent chose steamed rice. Also students were not aware of the functions of the nutrients. Forty-five percent of the students said that carbohydrates allowed protein to be used for body building, which was the correct response, while 30 percent thought that carbohydrates helped the body to conserve water, and 19 percent believed that carbohydrates build muscles.

*Seventh and Eighth graders* : Students in Seventh and Eighth grade were not aware of the sources of nutrients or energy. Slightly more than half of the students were aware that a pregnant women needs more protein than an active teenager or adult. Also, half of the students selected milk over hamburger, and more chose pineapple than hamburger, as a good source of iron. Students were asked to select the most nutritious fast-food meal of four. More than half (58 percent) chose chicken, mashed potatoes, and a roll over sausage cheese pizza, and salad (29 percent). The students were not aware of the nutrient value of pizza. Also, when asked to select nutritious food combinations for breakfast, only 16 percent selected correctly. Perhaps this was because one of the means offered non-traditional breakfast items such as a hamburger with banana milkshake compared to the traditional juice, egg, cereal, and

**Table 3.** Regression of nutrition knowledge scores on gender

Independent variable	6 <sup>th</sup> graders, n=178		7 <sup>th</sup> & 8 <sup>th</sup> graders, n=354	
	F values	P	F values	P
Gender	0.44	0.5078 <sup>a</sup>	11.74	0.0007 <sup>b</sup>

a=p>0.05, b=p>0.0001.

milk. Perhaps adolescents thought that eating a hamburger in the morning is inappropriate behavior and that particular foods are to be eaten at only certain times of the day.

### CONCLUSION

Students scored higher on the questions relating to the cultural and psychological aspects of nutrition and food than did on the identification of nutrient functions, and food sources. They had difficulty identifying food sources for nutrients such as iron, and food combinations which would supply adequate amounts of essential nutrients. Students had higher scores for consuming milk and milk products, and also for different kinds of vegetables. Although the students did not generally skip meals to cut down on calories, they were not particularly interested in the nutrient composition of the foods they ate, nor were they really interested in using a daily food guide to choose better foods.

Approximately 65 percent of the sixth grade students indicated that although they knew candy, potato chips, and soft drinks were not the most nutritious snacks, they chose to eat them because their friends did. The result from this question support Contento and her colleagues' suggestion that friends and peers exert a large influence on what adolescents choose to eat.

According to the results from the current study, it can be concluded that the nutrition knowledge of seventh and eighth grade students was low compared to Halverson's study. In the current study the mean nutrition knowledge of 7th and 8th graders was 11.8, and 11.5 respectively, out of a possible score of 25. In Halverson's study the mean nutrition knowledge was 12.5 for seventh graders, and 13 for eighth graders, out of a possible score of 25. In the current study, mean nutrition knowledge scores of seventh and eighth grade girls were higher than boys. This finding is similar to Dwyer's (1970) study that reported the mean score on the nutrition knowledge test of high school students was slightly above 55% with girls scoring higher than boys. Also, gender differences in knowledge could be related to similar findings in adults (19,20). In this study gender (Males and Females) was a significant predictor of knowledge for the seventh and eighth graders, only.

Because of low nutrition knowledge of sixth, seventh and eighth grade students, one corrective measure that might be considered is: Have nutrition educators cooperate with educational policy makers to integrate a nutrition course at all levels in school.

The results from this study can not be generalized as a result of data collection from Shawnee Middle School. This school has higher rates of middle to upper income

families (a factor that could affect nutrition knowledge). Therefore the results can be generalized to those particular schools which have similar characteristics to Shawnee Middle School (middle to upper income families). In fact in United States there are many school districts with this particular characteristic (higher income families).

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