An Examination of Adolescents' Knowledge and Attitudes Related to Heart Disease, Nutrition, Physical Activity, and Media Influences and the Adoption of a Healthy Lifestyle

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Abstract

The present pilot study aimed to determine the attitudes, beliefs, behaviors, and degree of knowledge among adolescents related to healthy eating, exercise, heart disease, the influence of television, and possible factors in modifying their attitudes toward adopting a healthy lifestyle. The sample was comprised of a total of 62 juniors and seniors from two private high schools in metro Atlanta. The study was based on the Social Cognitive Theory and the Health Belief Model. The research questions examined the impact of nutrition and heart disease knowledge on physical activity behavior, and the impact of television media exposure on eating habits. A 36-question cross-sectional survey compiled from various sources in the literature and health-related organizations was used to assess the outcomes of interest. Data analysis was conducted using frequencies, descriptive statistics, simple hypothesis tests, and chi-square analysis. After data analysis, those who reported physical activity participation and those who did not, were not found to differ significantly on their composite nutrition and heart disease knowledge score, F (6,55)=.763, p=. 602. The three groups, reporting different amounts of physical activity participation in hours/week, were not found to differ significantly on their composite nutrition and heart disease knowledge score F (6, 50)=1.628, p=. 159. However, for both Homogeneity of variance was significant at (p=.001) and (p=.017), respectively indicating that the physical activity participation and the levels of physical activity participation vary greatly among the different knowledge score groups. In terms of television viewing's effect on eating habits, two of the three questions used to measure eating habits were not found to be significantly influenced by television viewing. The groups based on adolescents' amounts of television viewing did not differ significantly on how frequently, they ate breakfast, F (3, 57)=2.269, p=. 090; or on how often they ate fast food, F (1, 59)=. 025, p=. 875. Yet, a chi-square test showed that the amount of television hours viewed on a typical weekday were significantly related to how often an adolescent thinks about their health when deciding what to eat (X=. 008). The 5 groups of amounts of television viewing hours, differed significantly on how often adolescents' thought about their health when deciding what to eat, specifically those who think about their health always and sometimes F (3, 57)=3.241, p=. 029). The Post Hoc test showed a significant difference of .998 in the amount of TV watched by those who always think about their health when deciding what to eat and those who sometimes think about it. Those who answered sometimes watched more hours of television (M=3.10) than those who answered that they always think about their health when deciding what to eat (M=2.11). Knowledge was not found to play a significant role in the adolescents' physical activity participation or their amount of physical activity participation. However, the significant variation in physical activity participation among the different groups of knowledge scores, suggests that at relationship between knowledge and physical activity behavior exists. Television viewing was not found to play a significant role in the frequency of breakfast food consumption or fast food consumption. Yet, television viewing was significantly related to how often adolescents think about their health when deciding what to eat.

jGPHA (2006), Volume 1, Number 1
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Of the 2.4 million deaths in the United States in 2000, 16.6% or 400,000 deaths were related to poor diet and physical inactivity (Mokdad, Marks, Stroup, & Gerberding, 2004). In comparison, 18.1% of total U.S. deaths or 435,000 deaths were from tobacco usage. The narrowing of the gap between these two leading preventable causes of death led Mokdad et al. (2004) to the conclusion that poor diet and physical inactivity could at some time in the future overtake tobacco use as the leading preventable cause of death.

According to the American Heart Association, many high school students are living unhealthy lifestyles, which can lead to the development of chronic disease (American Heart Association, 2003). A study of 15,349 public and private high school students in the United States, using data from the 1999 Youth Risk Behavior Survey (YRBS) indicated that adolescents do not understand that exercise and dietary choices work together to prevent disease. In that study, Lowry, Galuska, Fulton, Wechsler, and Kann (2002) found only 62% of females and 41% of males utilized a combination of exercise with a reduced fat diet to lose weight or maintain their current weight. However, in an assessment of adolescents' eating habits, Story, Neumark-Sztainer, and French (2002) cited knowledge as being the only factor which would make adolescents adopt healthful eating behaviors.

In addition to knowledge, the media can be an influential factor in adolescents' health behavior. An example of such an influence is the news program, Channel One, which is shown daily in many schools nationwide. According to Story and French (2004) students who viewed Channel One programming, where food commercials were regularly shown, were found during a typical month of viewing to have more positive attitudes about the advertised products. Although students did not report more frequent purchases of the advertised products, they were more likely to report intensions to purchase compared to students who did not watch Channel One (Story & French, 2004).

Despite the negative influences on adolescent health behavior, cardiovascular disease risk factors, including obesity, eating a high fat and high sugar diet, not participating in regular physical activity, and filling leisure-time with hours of television watching and Internet surfing are modifiable. The purpose of the present pilot study was to examine several of the factors that potentially influence adolescents' physical activity and eating habits and behaviors all in one study. Previous research has focused on each of the four areas of interest to the researchers (heart disease knowledge, nutrition knowledge and eating habits, physical activity, and television media) separately or with only one of the other areas. The researchers aimed to combine all of these areas into one survey and to examine angles that have not previously been examined.

The present pilot study investigated the attitudes, beliefs, behaviors, and degree of knowledge among adolescents related to healthy eating, exercise, heart disease, the influence of television, and possible factors in modifying their attitudes toward adopting a healthy lifestyle. It was designed to be both descriptive and exploratory in determining the relationship between knowledge (of both heart disease and nutrition) and physical activity behavior in adolescents, as well as in determining the relationship between adolescents' level of television exposure and their eating habits.

METHODOLOGY

The target population consisted of high school juniors and seniors, ages 16 and 17, in five counties within the Metro Atlanta area. To measure this population effectively, a stratified multi-stage cluster sample design was implemented for selecting the study sample. The researchers stratified the sample by county and type of school (public vs. private). Initially 33 high schools were randomly selected, consisting of 21 public and 12 private high schools. The current pilot study focused on surveying students in the private high schools. The decision to focus only on the private high schools was made due to time constraints. In order to survey in the public high schools, the project had to go through an institutional review board in each county's school board, a process that was estimated to take three months. This was not initially known by the researchers and was not feasible due to time constraints on completing the thesis study.

After random selection of the 12 private high schools and receiving approval from the authors' Institutional Review Board, packets were sent to the prospective high schools. Each packet contained an introductory letter that introduced the study and requested the school's participation, as well as copies of a student consent form, parental consent form, student assent form, and the survey to be completed by the participating students. Those schools that did not respond by the given deadline received follow-up phone calls and emails from the principal investigator. After follow-up contacts, a total of nine schools responded, three did not respond, and only two schools accepted the invitation to participate. A survey administration date was then scheduled with each high school contact person.

In order for students to be eligible for participation in the study, students had to be enrolled in either of the two private high schools, currently in 11th or 12th grade, 16 or 17 years of age, and had to present the appropriate signed consent form and in some cases assent form as well to the principal investigator before they could complete the survey. Students, who were 16, were required to sign a student assent form and bring in the parental consent form signed by their parent. Meanwhile, students, who were 17, were required to bring in a parental consent form signed by them and their parent. These consent measures were required by Emory's Institutional Review Board. Those students who did not have the properly signed forms at the time of survey administration were not allowed to participate. Prior to the study, all students who met the inclusion criteria, other than having a signed consent form, were given background information about the study, a letter asking for their participation, a student consent form, a parental consent form, and a student assent form for those students who were 16 years old or younger. The total sample consisted of 62 students from two private high schools in Fulton County, Georgia.

The sample design allowed the study's researchers to maximize data collection while providing maximum confidentiality for study participants. All surveys were identified using an ID code number, which accounted for the individual participant, county, type of school, and name of the school. The consent forms were collected separately from the survey instrument and collected separately from the data.

The survey used in this study contained 30 close-ended questions assessing attitudes, knowledge, and behavior in relation to nutrition, heart disease, physical activity, body image, and media influences. They were based on survey items developed by the American Heart Association, the National Heart, Lung, and Blood Institute, and the Eating Disorders Network in Atlanta, Georgia, where their validity and reliability have been tested. These close-ended questions included multiple choice, true/false, Likert scale, and rank order.

An additional five questions collected demographic information on the students, and one final self-reported question asked for approximate weight and height. The thesis committee members acted as a panel of experts and reviewed the survey for face validity. The survey was pilot-tested on five juniors and five seniors from one private and one public high school in metro Atlanta, and appropriate revisions were made. Data collection for the present pilot study's two main research questions was based on 12 of these survey questions (Table 1 and Table 2).

After collecting data from the students, the data were entered, managed, and stored by the principal investigator. The data were analyzed using SPSS 12.0. Analytical methods included descriptive statistics, cross-tabulations simple hypothesis tests (such as one-way ANOVA), and chi-square analyses. Descriptive analysis was utilized to examine the characteristics of the sample in order to determine a profile of the sample and as a safeguard, providing raw data to double check more complex analysis against. Furthermore, cross-tabulations were performed as a base from which to determine if a relationship existed between two variables of interest. ANOVA was used to answer the research questions because the researchers wanted to study if there were differences between two variables which each contained multiple categories or groups in this case. Finally, chi-square analysis was employed to determine the magnitude of any significant relationships, which were found using ANOVA.

LIMITATIONS

Some of the potential limitations of this study included having a small sample size, having the survey only administered in private high schools, race distribution, and the lack of an incentive offered to students to participate. First, a small sample size may have resulted in a decrease in the number of significant relationships found between variables during data analysis. Secondly, the study cannot be generalizable to all adolescents within each of the initially selected Georgia counties because the survey was only administered in private high schools. Also, the limitation of race distribution stemmed from this because the private schools were not as racially diverse as initially anticipated by the researchers. Finally, the study's inability to offer an incentive to participants is thought to have limited the amount of schools, which chose to participate.

FINDINGS

A total of 62 students completed the survey. In terms of gender, the majority of the students surveyed were female (61%, n=38), and 39% (n=24) were male. Also, the sample was overwhelmingly Caucasian (86%, n=53). African-Americans were the second highest represented race at 11% (n=7) with Asian, and Native Hawaiian or Pacific Islander both comprising 1.6% (n=1) of the sample respectively. Among the students surveyed, the majority were high school juniors (63%, n=39), and 37% (n=23) were high school seniors. Of the sample, 17-year-olds comprised 64% (n=40) and 16-year-olds comprised 36% (n=22).

The Impact of Knowledge on Behavior

The first research question, "What is the relationship between nutrition and heart disease knowledge and physical activity behavior in adolescents?" examined the impact that adolescents' nutrition and heart disease knowledge had on their decision to participate or not to participate in physical activity, and on the amount of their physical activity participation. In order to perform this analysis, variables were recoded to compute a composite knowledge score based on a total of six nutrition and heart disease knowledge questions (Table 1).

Table 1

Survey Questions used for Research Question #1: "What is the relationship between nutrition and heart disease knowledge and physical activity behavior in adolescents?"

Source	Survey Question	Measurement	Response Categories	Alteration of Item
(Turconi, G., Celsa, M., Rezzani, C., Biino, G., Sartirana, M.A., and Roggi, C, 2003)	Do you participate in physical activity?	Measures whether or not students participate in physical activity in general	Yes, No	Answer choices were changed from (always during the entire year, only in some seasons, sometimes, never) in order to better measure the outcome of interest in the study.
	If you answered yes: How many hours do you practice physical activity a week?	Measures amount of time spent participating in physical activity	-1-2 hours in a week -3-4 hours in a week -more than 4 hours in a week -0 hours a week	This item was not altered.
(Thakur, N. & D'Amico, F., 1999)	What percentage of one's daily total calories should come from fat? (Choose which range this percentage would fall into)	Measures Nutrition Knowledge	-0%-less than 20% -20%-less than 40% -40%-less than 60% -60%-less than 80% -80%-100%	The answer choices were expanded from three to five based on responses from the pilot test of the survey.
(Butler, Susan, 2003)	How many servings of calcium products should you eat on a daily basis?	Measures Nutrition Knowledge	-1 -2 -3 -4 -5	This item was not altered.
(Vale, Ann, 2000)	Which of the following is not a risk factor linked to the development of heart disease?	Measures Heart Disease Knowledge	-high blood pressure -high cholesterol -diabetes -arthritis -obesity	This item originally was an open-ended question with no answer choices. It was altered because the panel of experts felt it would be more conducive for data analysis in a close-ended form.
(American Heart Association, 1991)	To help decrease your blood cholesterol, which of the following foods should you limit in your daily diet?	Measures Heart Disease Knowledge	-Fish -Salty foods (pretzels, potato chips) -Sugar rich foods (cookies) -Red meat -Breads and cereals	Some of the answer choices were changed to include more specific examples of certain food groups. For example, one of the original answer choices was fats and oils.
Which of these nutrients, when eaten in excessive amounts, affects blood cholesterol the most?	Measures Heart Disease Knowledge	-total fat -saturated fat -cholesterol -sodium -protein	This item was not altered.	

Table 2

Survey Questions used For Research Question #2: "What is the relationship between adolescents' level of television exposure and their eating habits?"

Source	Survey Question	Measurement	Response Categories	Alteration of Item
(Turconi, G., Celsa, M., Rezzani, C., Biino, G., Sartirana, M.A., & Roggi, C, 2003)	How many days in a typical week do you eat a meal between the hours of 6 a.m. and 8:30 a.m.?	Measures eating habits	-always (7 days/week) -often (5-6 days/week) -sometimes (3-4 days/week) -never (0 days/week)	The question was only altered in that it included a specific time period to define breakfast.
(Butler, Susan, 2003)	How many times a week do you eat meals in a fast food restaurant, meaning restaurants that either have a drive-in-window, they deliver food, or you order your food at a counter inside the restaurant?	Measures eating habits	-Never -Less than once a week -1-2 times a week -3-4 times a week -5-6 times a week -Everyday	This item was not altered.
(Shannon, C., Story, M., Fulkerson, J.A., & French, S.A., 2002)	How often do you think about your health when deciding what to eat?	Measures eating habits	-Always -Sometimes -Rarely -Never	The answer choices of "rarely" and "never" were added. The original question had only to answer choices.
Stanton, W.R., Willis, M., & Balanda, K.P. (2000)	On weekdays, how many hours do you usually spend doing the following? Watching TV: ____	Measures amount of television viewing	-up to 1/2 hour -1/2-1 hour -1-1-2 hours -2-3 hours -more than 3 hours	This item was not altered.

Each student received one point if they answered a question correctly and zero points if they answered a question incorrectly. The lowest composite knowledge score obtainable was a zero, meaning not answering any of the questions correctly and the highest composite knowledge score obtainable was a six, meaning answering all of the questions correctly.

The results of the one-way ANOVA revealed that the two groups, those who reported physical activity participation and those who did not, did not differ significantly on their composite nutrition and heart disease knowledge score, $F(6,55)=.763$, $p=.602$, (Table 3). Thus, students' nutrition and heart disease knowledge scores did not show a significant relationship with their physical activity participation. However, the homogeneity of variance was significant at ($p=.001$), indicating that physical activity participation varies greatly among the different knowledge score groups (Table 4). For example, examining the cross-tabulation of physical activity participation and knowledge scores, out of the six students who did not participate in physical activity, three of them answered more than half (4) of the knowledge questions correctly. Meanwhile, 12 of the 56 students who participated in physical activity attained this same knowledge score, answering more than half (4) of the knowledge questions correctly (Table 5).

Also, in comparing the amount of physical activity participation and knowledge score, the results did not show a significant relationship between the two variables. Specifically, the results of the one-way ANOVA revealed that the three groups, reporting different amounts of physical activity participation in hours/week, did not differ significantly on their composite nutrition and heart

Table 3

Analysis of Variance comparing physical activity participation across knowledge scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.416	6	.069	.763	.602
Within Groups	5.003	55			
Total	5.419	61			

Table 4

Homogeneity of Variance for Physical Activity Participation Across Knowledge Scores

Levene Statistic	df1	df2	Sig.
5.245[a]	5	55	.001

a. Groups with only one case are ignored in computing the test of homogeneity of variance for 18a. Do you participate in physical activity?

Table 5

Cross-tabulation of physical activity participation and knowledge scores

		Participate in Physical activity	Do not participate in physical activity	Total
Total	0	1	0	1
Knowledge	1	4	0	4
Score	2	8	1	9
	3	14	0	14
	4	[12]	[3]	[15]
	5	[12]	[2]	[14]
	6	[5]	[0]	[5]
		[Subtotal 29]	[Subtotal 5]	[Total 34]
Sample Total		56	6	62

disease knowledge score F (6, 50)=1.628, p=. 159, (Table 6). However, the homogeneity of variance was significant at (p=.017), indicating that the levels of physical activity participation varied greatly among the different knowledge score groups (Table 7). The variation can be seen in the cross-tabulation of the total knowledge score with the amount of physical activity participation students reported doing in hours per week (Table 8). For example, there were ten (10) students who reported exercising more than four hours in a week, and who received a composite knowledge score of four. Yet, three students who reported exercising 1 to 2 hours in a week got an even higher composite knowledge score of five.

The Impact of Television Viewing on Adolescent Eating Habits

The second research question, "What is the relationship between adolescents' level of television exposure and their eating habits?" sought to understand the effect that the amount of television viewing during a typical weekday had on their eating habits. The surveys questions assessing eating habits included: 1) How many days in a typical week do you eat a meal between the hours of 6:00 and 8:30 a.m.? 2) How many times a week do you

Table 6

Analysis of Variance comparing the amount of physical activity participation in hours/week across knowledge scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.234	6	.872	1.628	.159
Within Groups	26.801	50	.536		
Total	32.035	56			

Table 7

Homogeneity of Variance for physical activity participation in hours/week across knowledge scores

Levene Statistic	df1	df2	Sig.
3.083[a]	5	50	.017

Groups with only one case are ignored in computing the test of homogeneity of variance for 18b. If you answered yes: How many hours do you practice physical activity a week?

Table 8

Cross-tabulation of physical activity participation in hours/week and knowledge score

		1-2 hours in a week	3-4 hours in a week	more than 4 hours in a week	Total
Total Knowledge Score	0	1	0	0	1
	1	1	2	1	4
	2	1	2	5	8
	3	3	4	7	14
	4	0	2	[10]	12
	5	[3]	2	8	13
	6	0	2	3	5
Total		9	14	34	57

eat meals from a fast food restaurant, meaning restaurants that have a drive-in window? and 3) How often do you think about your health when deciding what to eat? (Table 2). Question 2, was recoded dichotomously, into those who do not eat fast food often, which included the answer choices, never and less than once a week, and those who do eat fast food often, which included the answer choices, 1-2 times a week, 3-4 times a week, 5-6 times a week, and everyday.

All three analyses were completed using a one-way ANOVA and the final relationship assessed also included a cross-tabulation and a chi square test. The one case of missing data on the number of television viewing hours was excluded from analysis, leaving a total of N=61 for the analyses completed to answer this research question.

In examining whether or not a relationship between the amount of television watching and frequency of breakfast consumption existed, data analysis did not indicate a significant relationship. Specifically, the results of the one-way ANOVA revealed that the 5 groups based on amounts of television viewing hours, did not differ significantly

on how frequently they ate breakfast, F (3, 57)=2.269, p=.090, (Table 9).

In determining what effect the amount of television viewing hours had on eating habits, analysis did not show a significant relationship between the two variables. In fact, the results of the one-way ANOVA revealed that the amounts of television viewing hours, did not differ significantly on how frequently adolescents ate fast food, F (1, 59)=.025, p=. 875, (Table 10). Although not significant, descriptive statistics showed that, overall, slightly more adolescents (34) did fall into the category of often eating fast food, in comparison to 27 adolescents who were shown not to eat fast food often.

Table 9

Analysis of Variance for Eating Breakfast across groups of television watching by hours

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.182	3	3.061	2.269	.090
Within Groups	76.883	57	1.349		
Total	86.066	60			

Table 10

Analysis of Variance for amount of time eating fast food across groups of television watching by hours

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.036	1	.036	.025	.875
Within Groups	86.029	59	1.458		
Total	86.066	60			

A final one-way ANOVA was conducted to examine if a difference existed in how often adolescents' thought about their health when deciding what to eat, based on their differing amounts of television viewing. The results of the one-way ANOVA revealed that the 5 groups based on amounts of television viewing, differed significantly on how often adolescents' thought about their health when deciding what to eat, specifically those who think about their health "always" and "sometimes" F (3, 57)=3.241, p=. 029, (Table 11). Tukey's post-hoc test showed a significant difference of .998 in the amount of TV watched by those who always think about their health when deciding what to eat and those who sometimes think about it (Table 12). Those who answered sometimes thought about their health when deciding what to eat watched more hours of television (M=3.10) than those who answered that they always think about their health when deciding what to eat (M=2.11) (Table 13). The cross tabulation of the two variables displays the raw data, which are representative of such conclusions (Table 14). Overall, a chi-square test showed that the amount of

Table 11

Analysis of Variance for how often one thinks about health when making food choices across groups of television watching by hours

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.541	3	4.180	3.241	.029
Within Groups	73.525	57	1.290		
Total	86.066	60			

Table 12

Multiple Comparisons:
Tukey Post Hoc Tests for how often one thinks about health when making food choices across groups of television watching by hours

How often do you think about your health when deciding what to eat?		Mean Difference (I-J)	Std. Error	Sig.
1=Always	2=Sometimes	-.998*	.335	.022
	3=Rarely	-.258	.430	.931
	4=Never	-.395	.844	.966
2=Sometimes	1=Always	.998*	.335	.022
	3=Rarely	.740	.402	.266
	4=Never	.603	.830	.886
3=Rarely	1=Always	.258	.430	.931
	2=Sometimes	-.740	.402	.266
	4=Never	-.136	.873	.999
4=Never	1=Always	.395	.844	.966
	2=Sometimes	-.603	.830	.886
	3=Rarely	.136	.873	.999

Table 13

Mean hours of television watched per group of attitude toward health when making food choices

How often do you think about your health when deciding what to eat?	Mean	N	Std. Deviation
1=Always	2.11	19	1.449
2=Sometimes	3.10	29	.976
3=Rarely	2.36	11	.924
4=Never	2.50	2	.707
Total	2.64	61	1.198

television hours viewed on a typical weekday were significantly related to how often an adolescent thinks about their health when deciding what to eat, $X^2(4, N=61)=12, p=.008$, (Table 15).

In addition to the findings on relationships between variables of interest, there were interesting descriptive statistics based on responses to the questions assessing physical activity and breakfast eating habits. Interestingly, the majority of the 62 adolescents surveyed reported either eating breakfast often (5-6 days/week) or always eating breakfast (7 days/week), at 36% (n=22) and 23% (n=14) respectively. An overwhelming 72% (n=41) out of a sample of the 57 adolescents, who responded to this question, were not currently enrolled in any physical education class. However, adolescents

Table 14

Cross-tabulation of hours of television watched and how often adolescents think about their health when deciding what to eat

		How often do you think about your health when deciding what to eat?				
		1=Always	2=Sometimes	3=Rarely	4=Never	Total
Watching TV (In hours)	1=up to1/2hour	9	2	2	0	13
	2=1/2-1 hour	5	5	4	1	15
	3=1-2 hours	2	11	4	1	18
	4=2-3 hours	0	10	1	0	11
	5= >3 hours	3	1	0	0	4
Total		19	29	11	2	61

Table 15

Chi-Square Tests of hours of television watched and how often adolescents think about their health when deciding what to eat

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.016	12	.008
Likelihood Ratio	30.615	12	.002
Linear-by-Linear Association	.794	1	.373
N of Valid Cases	61		

reported participating in physical activity via sports teams. A total of 31% (n=18) of the 59 adolescents, who responded to that question, had been a member of one sports team in the past year and 48% (n=28) of the adolescents reported participating on two sports teams in the past year. Also, the majority of 62 adolescents surveyed (69%, n=43) found eating disorders to be only a minor problem at their school. Finally, adolescents were evenly split in response to the question about eating sweet snacks between meals. A total of 50% (n=31) reported eating sweet snacks between meals, while the other 50% (n=31) reported not doing so.

SUMMARY

In conclusion, this study showed a significant relationship between television viewing and thinking about health when deciding what to eat. This relationship was found to be significant by the Chi-Square Test and by the one-way ANOVA. In addition, the Tukey Post-Hoc Test showed those who watched more television on average were more likely to consider their health either sometimes, rarely, or never when deciding what to eat. While those who watched the least amount of television on average were likely to always consider their health when deciding what to eat.

This pilot study examined knowledge, attitudes, and behaviors among adolescents related to heart disease, physical activity, healthy eating, media influence, and the adoption of a healthy lifestyle. The cross-sectional survey employed was unique in that it combined questions on health behavior, television viewing, chronic disease knowledge, and health behavior practice. The study found that the amount of television viewing was significantly related to how often adolescents thought about their health when deciding what to eat. This finding is supported by the American Academy of

Pediatrics, who found that the effect television had on health behaviors related to nutrition, dieting, obesity, and self-image were primarily negative (American Academy of Pediatrics, 2001).

However, there were no significant relationships established between the total nutrition and heart disease knowledge scores and physical activity behavior. Yet, the finding of significant variability among knowledge scores in light of physical activity participation and non-participation suggests a relationship may exist between knowledge and physical activity behavior. Also, there were no significant relationships established between breakfast eating patterns and amount of television viewing, or between the frequency of fast food consumption and amount of television viewing. The lack of significant relationships may have been due to the smaller than anticipated sample size.

Also, it should be noted that despite a significant relationship not being found between knowledge and physical activity behavior, the majority of the adolescents surveyed had participated in physical activity through a least one sport's team in the past year. This result reflects findings from a study by Winters, Petosa, and Charlton (2003). In an examination of 9th and 10th grade students in Ohio these researchers found that a total of 52% of the females and 68% of the males in the sample had participated in an organized team sport in the past year (Winters, Petosa, & Charlton, 2003). The overwhelming majority of adolescents in the present study who were found to not be enrolled in a physical education class were also supported by results of a previous study. In a study of 9th and 10th grade students in Ohio, Pearman, Valois, Thatcher, and Drane (2001) found that 58% of the public high school students and 70% of the private high school students in their sample did not take a physical education class. These findings suggest that before and after school activities, if any, provide most of adolescents' physical activity participation.

PUBLIC HEALTH IMPLICATIONS

This study has two primary implications for public health practice. First, since most of the indicated physical activity participation by the sample came from participation on sports teams, this study recommends that all students, regardless of ability, have access to and be encouraged to participate in sports teams, whether school-sponsored or recreational. Crucial information on healthy nutrition and heart disease prevention should be communicated through these sports teams, in order to make this knowledge more meaningful and of interest to adolescents.

Secondly, although fast food consumption and breakfast eating patterns were not significantly influenced by the amount of television viewing, food choice decisions were affected. This finding suggests that parents themselves need to educate their children about nutrition. Conflicting health messages on television can confuse adolescents and prevent them from thinking about their health when deciding what to eat.

At this time, there is a lack of data on the relationship between the multitude of factors influencing adolescent health decisions, their attitudes, and their behaviors related to heart disease prevention. In light of surging rates of heart disease risk factors and obesity in the adolescent population, further research is imperative.

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