Assessment of Nutrition Knowledge of Parents of Elementary School-aged Children to Enhance Obesity Knowledge and Prevention

Laurie Kinchen[a*], April McIntyre[b], Troy Hidalgo[c]

[a,b]Southeastern Louisiana University, SLU Box 10448, Hammond 70402, United States

[c]McNeese State University, MSU Box 90415, Lake Charles 70609, United States

[a]Email: laurie.kinchen@selu.edu

[b]Email: April.McIntyre@selu.edu

[c]Email: shidalgo@mcneese.edu

Abstract

Dietary intake has been linked to numerous diseases and comorbid conditions. Assessing nutritional knowledge is important to determine educational focus areas so that interventions and the need for additional research can be determined. The purpose of this descriptive study was to assess the nutritional knowledge of parents of elementary-aged school children by using the General Nutrition Knowledge Questionnaire (GNKQ). A descriptive design using a purposive sample of elementary-aged children's parents at an elementary school in Southeastern Louisiana was used for this study. The questionnaire was sent home with each student at the school (N = 574). Parents were instructed that participation was voluntary and that they should return the questionnaire, in the envelope provided, whether they chose to complete it or not. Only fully completed surveys were used for data analysis. A total of 146 questionnaires were returned with 36 being discarded due to incompletion. 110 completed questionnaires were used for this analysis, yielding a 19% return rate.

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* Corresponding author.

The average age range of participants was from 25-34 (50.9%; n=56), with the majority being female (90.9%; n=100), married (70.0%; n=77), employed full time (50.9%; n=56) with a high school education (41.8%; n=46). No strong correlation existed between variables. However, some mild correlations were present (See Table 4). Overall, a knowledge deficit was present in parental nutrition knowledge. As the epidemic of childhood obesity continues to rise, something must be done to combat the problem. Using future research in the area of parental knowledge of nutrition, interventions can be tailored directly to parents.

Keywords: nutrition; knowledge; school-aged children; obesity; healthy diet; Body mass index.

1. Introduction

The Nutrition and Weight Status objectives for Healthy People 2020 emphasize strong science supporting the health benefits of eating a healthful diet and maintaining a healthy body weight/Body Mass Index (BMI). The objectives also stress that efforts to change diet and weight should address individual behaviors, as well as the policies and environments that support these behaviors in settings such as schools, worksites, health care organizations, and communities [1]. Weight status and food intake have been linked to health determinants and fruit and vegetable consumption has been linked to a reduction in stroke, heart disease and cancer risks while consumption of saturated, polyunsaturated fat, carbohydrates and sugars has been linked to obesity, heart disease, stroke and other vascular diseases [2]. Growing rates of overweight and obesity worldwide are associated with a rise in chronic diseases such as cancer, cardiovascular disease and diabetes. These conditions are affecting the poor and most vulnerable in escalating numbers. Intake amounts of micronutrients such as iron, vitamin A, zinc and iodine have been linked to deficiency syndromes [2]. More than one-third of United States adults and almost 17% of youth were obese in 2009–2010 [3]. In the United States, the number of overweight children and adolescents has doubled in the last two to three decades, and similar doubling rates are being observed worldwide, including in developing countries and regions where an increase in Westernization of behavioral and dietary lifestyles is evident. Obesity is defined as a BMI at or above the 95th percentile for children of the same age and sex [3]. Obese children are more likely to experience hypertension, high cholesterol, type 2 diabetes, asthma, sleep apnea and orthopedic problems than their normal-weight peers. It has also been associated with adult cardiovascular disease, heart attack, stroke and some cancers. These children are also at an increased risk for psychological problems including depression and anxiety [4]. The assessment of nutritional knowledge in a population is important to: 1) determine areas of knowledge deficit, 2) monitor outcomes of education, 3) create future interventions and 4) guide future research [5]. Overall knowledge of healthy nutrition is lacking and parents specifically lack adequate knowledge of healthy foods, the food pyramid and preparation of low-fat meals [5]. Nutritional knowledge level and socioeconomic status influence dietary choices with adequate fruit and vegetable intake and overall diet quality are more strongly associated with higher incomes [6]. The literature supports that there is an association between knowledge of nutrition and weight/health status and dietary lifestyles. The increasing incidence of childhood obesity and obesity-related diseases makes children a focus for health promotion. Parents are an influential mediator in behavioral strategies aimed at improving the lifestyle behaviors of young children. However, to adequately perform as mediators for change, proper knowledge and motivation to understand dietary guidelines is necessary [7]. Considering the association between nutritional knowledge and health status and the impact of parental influences on children's

behaviors, further research in the area of parental knowledge of nutrition is necessary to create interventions. The purpose of this study was to determine the nutritional knowledge level of parents of   elementary school-aged children in a selected elementary school in Southeastern Louisiana using the GNKQ developed by Parmenter and Wardle (1999).

2. Methods

Design

A descriptive design using a purposive sample of elementary aged children's parents at an elementary school in Southeastern Louisiana was used for this study.

The questionnaire was sent home with each student at the school (N =574). Parents were instructed that participation was voluntary and that they should return the questionnaire, in the envelope provided, whether they chose to complete it or not. Only fully completed surveys were used for data analysis.

Sample and Setting

The rates of childhood obesity in Louisiana were also a factor in the decision; thirty-five percent of children in Louisiana are considered overweight or obese. An elementary school in Southeastern Louisiana was chosen for the site of the study. According to the 2011 U.S. Census Bureau, this parish consists of white persons (92.0%), black persons (5.9%), Asian persons (0.5%) and persons of Hispanic or Latino origin (3.1%).

The median household income for the years 2006-2010 was $54,708 with 11.4% of inhabitants living below poverty level [3]. The school consists of grades Pre-K through 4th grade. Permission was obtained from the Parish School Board and school principal. Southeastern Louisiana University Institutional Review Board also granted approval for the study.

Instrument

The GNKQ was chosen as a validated and reliable instrument (reliability subscale range: 0.7 to 0.98) to assess comprehensive nutritional knowledge of adults for this study.

The GNKQ is comprised of four sections and a section regarding demographic information, with a total number of 54 items (See table 1). Section I tests the participants' knowledge of current dietary recommendations: four items (maximum score=11); section II assesses the participants knowledge of food groups: 21 items (maximum score=69); section III assesses participant knowledge in healthy food choices: 10 items (maximum score=10); section IV assesses participants knowledge of diet-disease relationships: 10 items (maximum score=20). The questionnaire questions are scored as either correct or incorrect answers, with 0 points for incorrect and 1 point for correct answers. Permission to use the GNKQ was obtained from the UCL Department of Epidemiology and Public Health.

Table 1: Questionnaire Subsections with example question

Section	Example
Section I Expert Advice	Do you think health experts recommend that people should be eating more, the same amount, or less of these foods? More Same Less Not Sure Vegetables ☐ ☐ ☐ ☐ Sugary Foods ☐ ☐ ☐ ☐ Meat ☐ ☐ ☐ ☐ Starchy foods ☐ ☐ ☐ ☐ Fatty foods ☐ ☐ ☐ ☐ High fiber foods ☐ ☐ ☐ ☐ Fruit ☐ ☐ ☐ ☐ Salty foods ☐ ☐ ☐ ☐
Section II Food Groups	Do you think these are high or low in salt? (choose one box per food) High Low Not sure Sausages ☐ ☐ ☐ Pasta ☐ ☐ ☐ Salmon ☐ ☐ ☐ Red meat ☐ ☐ ☐ Frozen vegetables ☐ ☐ ☐ Cheese ☐ ☐ ☐
Section III Healthy Food Choice	If a person wanted to reduce the amount of fat in their diet, which would be the best choice? (choose one) (a) steak, grilled ☐ (b) sausages, grilled ☐ (c) turkey, grilled ☐ (d) pork chop, grilled ☐
Section IV Diet-Disease Relationship	Are you aware of any major health problems or diseases that are related to how much salt or sodium people eat? (a) yes ☐ (b) no ☐ (c) not sure ☐ If yes, what diseases or health problems do you think are related to salt?

3. Data collection and analysis

Purposive sampling was used for this study. The GNKQ was sent home with every student from the school (N=574). Parents over the age of 18 were asked to participate in the study. A cover letter explained the study and instructed the parent to complete the questionnaire and return it in the envelope provided whether they chose to complete it or not. All sealed envelopes containing the questionnaire were collected from the school and opened after the deadline return date had passed. Incomplete or partially completed surveys were discarded. Only fully completed surveys were scored and used for data analysis. Data were entered into SPSS (version15)

for analysis. Pearson's correlation was used to correlate nutrition knowledge level for age, gender, marital status, education level, employment status and number and age of children. Frequency distributions were calculated for each question. Mean scores were calculated for each subsection of the questionnaire.

4. Results

A total of 146 questionnaires were returned with 36 being discarded due to incompletion. 110 completed questionnaires were used for this analysis, yielding a 19% return rate, despite the ease of return for the participants and reminders sent.

Table 2: Demographic Information of Participants

	N=110	
	n	%
Gender		
Male	10	9.1
Female	100	90.9
Age		
18-24	4	3.6
25-34	56	50.9
35-44	31	28.2
45-54	9	8.2
55-64	8	7.3
65-74	2	1.8
Marital Status		
Single	13	11.8
Married	77	70.0
Living as Married	5	4.5
Separated	4	3.6
Divorced	10	9.1
Widowed	1	0.9
# of Children		
1	17	15.5
2	48	43.6
3	32	29.1
4	8	7.3
>4	5	4.5
Education		
High School or GRE	47	42.7
Techincal or Trade	11	10.0
Some College	24	21.8
Associate's Degree	7	6.4
Bachelor's Degree	12	10.9
Master's Degree	6	5.5
Doctorate Degree	3	2.7
Employment		
Full Time	56	50.9
Part Time	6	5.5
Unemployed	9	8.2
Homemaker	32	29.1
Retired	4	3.6
Student	1	0.6
Disabled or Too Ill for Job	2	1.8

Causes of nonresponse could have been due to length of survey, lack of desire to participate and participants disregarding the survey over time. As depicted in Table 2, the average age range of participants was from 25-34 (50.9%; n=56), with the majority being female (90.9%; n=100), married (70.0%; n=77), employed full time (50.9%; n=56) with a high school education (41.8%; n=46). The mean score for each subscale was computed and presented in Table 3. Parents were most knowledgeable in the area of advice that experts give (range=3-10; μ =7.0)(See table 3), and least knowledgeable in the area of healthy food choices (range=1-8; μ=4.28) (See table 3).

Table 3: Subsection Mean Scores

N=110				
Subscale	Mean	Standard Deviation	Minimum	Maximum
Advice Experts Give	7.00	1.459	3	10
Food Groups	38.94	7.841	23	61
Healthy Food Choices	4.28	1.569	1	8
Diet-Disease Relationship	6.56	3.890	0	15

Pearson's correlation coefficient was calculated between demographic data and each subsection of the survey (see Table 4). As depicted in table 3 a mild positive correlation exists between education level knowledge of food groups (r=.342, p=0.000). A moderate relationship existed between knowledge of food groups and knowledge of diet-disease relationship (r=0.504, p=0.000). It was of interest to find that a negative correlation existed for parents with health-nutrition qualifications and their knowledge level in all subsections (see table 4).

Table 4: Pearson correlation coefficients between subscales and variables (upper part), and significance values (lower part).

	Value Reported	Advice Experts Give	Food Groups	Healthy Food Choices	Diet-Disease Relationships
Age	r	0.113	0.099	0.063	0.261
	p	0.238	0.308	0.515	0.006
Marital Status	r	0.040	0.035	-0.228	0.062
	p	0.675	0.722	0.016	0.517
Children	r	-0.152	-0.183	-0.023	-0.102
	p	0.112	0.057	0.808	0.288
Education	r	0.234	0.342	0.111	0.161
	p	0.014	0.000	0.248	0.092
Nutrition Qualifications	r	-0.128	-0.252	-0.168	-0.203
	p	0.182	0.008	0.080	0.034
Employment	r	0.102	-0.067	-0.015	0.040
	p	0.287	0.488	0.876	0.682
Special Diet	r	0.077	-0.084	-0.024	-0.212
	p	0.424	0.389	0.799	0.026
Total Score	r	0.596	0.935	0.518	0.737
	p	0.000	0.000	0.000	0.000

5. Discussion

Overall, a nutritional knowledge deficit existed in the participants, with the highest mean score being the area of food group knowledge with only 56% of participants reporting the correct answer. Only 32.8% of participants correctly answered the question on the disease and diet relationship subsection. This section required participants to include a narrative answer regarding certain foods and their relationship with certain disease processes. Many participants (30%; n=32) either did not answer the question or answered incorrectly. Lack of awareness of proper nutrition on the part of the parent can lead to malnutrition of the parent and child. The lack of return of surveys may show a disinterest on the part of the parents in regards to proper nutrition for the child and his family. This knowledge deficit is alarming considering that 43.6% of participants have at least two children living in their household and 29.1% of participants have at least three children.

6. Limitations

Small sample size was a possible limitation in this study. In addition, subjects were chosen from only one elementary school in Southeast Louisiana. This single setting restricts culture and income variations more than if the population had been more diverse; perhaps a mixture of low, middle and high income schools. Finally, these results are indicative of Southern Louisiana knowledge; it is hard to assume the same results in other areas of the state or other states.

7. Implications

The knowledge deficit of parents is alarming, especially in the area of healthy food choices, because parent-child interactions can affect the behaviors of children related to calorie intake and physical activity. Parents are role models for their children who are likely to develop habits similar to their parents [8]. Child and parent adherence to specific components of family-based behavioral weight control treatment are independent predictors of long-term child and parent percentage overweight change [8]. To aide in correcting the knowledge deficit of parents, nurse practitioners can serve as change mediators by conducting further research in this area and developing interventions that are tailored to the exact areas of knowledge deficit. With the multitude of information on nutrition available it is important that the information be streamlined and simplified so all parents, regardless of educational level, have ease of understanding. Some of the nutritional information available is conflicting and the USDA and other government agencies responsible for nutritional information need to resolve these inconsistencies.

8. Recommendations

Some recommendations should be mentioned regarding the GNKQ. The questionnaire was developed in the United Kingdom in 1999. Since the instrument was created and tested in 1999, some of the nutritional information is outdated. The questionnaires were scored using the original answers and did not adjust for the inconsistencies. The GNKQ is a reliable and well written tool, however, it is recommended that the tool be updated using current dietary guidelines, and retested for reliability and validity.

Future studies should include responses from a more diverse population. It is advised to question parents from various demographics across the United States. Perhaps an incentive of a free dress day for students who return the questionnaire would elicit more responses. In conclusion, as the epidemic of childhood obesity continues to rise, something must be done to combat the problem. Using future research in the area of parental knowledge of nutrition, interventions can be tailored directly to parents. Thus enhancing their knowledge and understanding of healthy eating and leading an active lifestyle.

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