Comparisons of Accuracy of Nutrition Knowledge of College Students With and Without Risk Factors for Type II Diabetes

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Abstract

Type II diabetes is a major health problem in the United States. Untreated type II diabetes may lead to cardiovascular disease, nephropathy, neuropathy, degenerative eye health, blindness, or other catastrophic complications including death. Awareness, prevention, and intervention based programs for those at-risk for type II diabetes, those currently diagnosed, and the general public are essential to lowering the incidence of type II diabetes in the United States. This study was developed to measure accuracy of nutrition knowledge of college students without known risk factors compared to those with risk factors for type II diabetes. No significant differences were found in accuracy of nutrition knowledge between students with risk factors and those with no risk factors for type II diabetes. The findings of this study are of importance in providing awareness of nutrition knowledge deficit for college students at-risk for type II diabetes.

Diabetes is an increasing problem in the United States and affects an estimated 23.6 million Americans (1). Medical costs, health-care interventions, and incidences of morbidity related to diabetes are costly in terms of both economics and lives damaged by this chronic disease. Nutrition knowledge of the general public, including the current generation of college students, must include accurate information in relation to type II diabetes prevention through nutrition, as well as other lifestyle changes. Evidenced-based information focused on prevention of this chronic disease is slowly being disseminated in society through education in businesses, schools, and healthcare facilities. News headlines have highlighted large corporations like insurance giant Geico, software magnate Microsoft, and smaller companies that have taken steps toward wellness initiatives and incentives. Programs such as implementing community nutrition groups and health workshops have been started through partnerships on local, state, and international levels.

It has become increasingly evident that the accuracy of nutrition knowledge as related to chronic diseases and obesity has been inadequate, as evidenced in nutrient deficient dietary habits and prevalence of chronic disease. In the United States obesity rates have increased drastically over the past 2 decades (2, 3); 64% of adults aged ≥ 20 years old were classified as overweight and 30% were classified as obese from 1999-2000. Meta-analysis for 68,556 US adults in the National Health Interview Survey by the Centers for Disease Control and Prevention showed that the highest obesity rates were linked with the lowest incomes and educational levels (4). Decreased morbidity and mortality may be attainable when positive nutrition and healthy lifestyle habits are used throughout the lifespan (5, 6). This study was designed to assess accuracy of nutrition knowledge in college students who, as young adults, are in charge of their dietary intake.

Type II diabetes may develop as result of genetic predispositions, and can also be attributed to excess weight, dietary habits, other behavioral and environmental factors; Type II diabetes can be present at any age (7, 8, 9). There is no cure for diabetes, however lifestyle management has been found to ameliorate this disease. Treatment and prevention of Type II diabetes requires self-management of diet and exercise and controlled glucose levels. According to a diabetes prevention trial, diet and lifestyle changes can both prevent and treat Type II diabetes more successfully than prescription medication or prophylactic drug therapy (such as metformin) (10).

Measures of nutrition knowledge level and areas to intervene in terms of prevention in college students have not been extensively studied. A review of the literature reveals that relationships among 1) knowledge of risk, 2) knowledge of preventative behaviors, and 3) implementation of appropriate dietary and exercise behavior modifications have yet to be studied in college students in the United States who are at risk for type II diabetes. Prevention and intervention programs among Canadian adults and school-age children have been found to prevent and treat the onset of type II diabetes (11, 12, 13, and 14). In the United States we have not measured the accuracy of nutrition knowledge among college students. It is the intention that this study can serve as an indication of possible

deficits of nutrition knowledge and reveal areas of opportunity for prevention and control onset of type II diabetes in college students and other young adults.

The purpose of this study was to establish if there was a difference in accuracy of nutrition knowledge between college students with risk factors for type II diabetes compared to those who did not report risk factors. The study was developed subsequent to a pilot study which analyzed food choices and exercise patterns of those with risk factors compared to those without risk factors. The two populations did not differ in diet, exercise, or lifestyle (15). Consistent with those findings, it is hypothesized that accuracy of nutrition knowledge will not differ across groups. The following null hypotheses will be tested.

Hypotheses

1) Accuracy of nutrition related knowledge will not differ between participants at-risk for type II diabetes compared to those not at-risk.
2) Nutrition knowledge related to diabetes will not differ between participants at-risk and to those not at-risk.
3) Accuracy of nutrition knowledge will not differ when self-rating diet as "healthy" or unhealthy" between groups.
4) Ratings of healthy nutritional intake of those at-risk versus those not at-risk will not differ.

METHOD

Participants

Participants for this study included 58 college students from a southern state university. Students were recruited from upper division psychology summer classes. Consent was obtained from all participants prior to inclusion in the study. Students were given the paper survey in the classroom in one session, answered with pen or pencil.

Instrument

The survey instrument was composed of 29 multiple choice or true/false questions. The survey tool was compiled into four sections. Nutrition questions included in the survey were selected from among basic nutrition facts consumers should know. See Appendix C for the complete survey instrument. The survey was divided into four sections, descriptions of which follow.

Section 1 consisted of three questions asking participants to rate their knowledge of general nutrition information. A Likert scale from 1-5 was used with 1-strongly agree, 2-somewhat agree 3-unsure 4-somewhat disagree 5-strongly agree.

Section 2 contained thirteen items that required identification of specific foods, serving sizes, and interpretation of a nutrition facts label.

Section 3 contained seven multiple choice questions related to serving size, portions, function of insulin, and consequences of diabetes.

Section 4 consisted of six questions asking participants to identify their risk factors for type II diabetes and healthiness of their diet.

Questions were selected based on expectations of nutrition knowledge appropriate to this age group and were not intended to be a formal scale. The questions were tailored to be reflective of visual cues in our daily environment. Proper portion sizes were cited from common sources as well as the familiar website, WebMD. See Appendix D.

RESULTS

Fifty-eight participants completed the survey instrument and were evaluated on accuracy of nutrition knowledge related to risk factors for type II diabetes. Analyses were performed using Predictive Analytics Software (PASW). Independent samples t-tests were completed for hypotheses. Correlations for selected variables were completed to determine Pearson product-moment correlations. See Table 2 for correlation matrix.

Hypothesis 1 stated that accuracy of nutrition knowledge would not differ between participants at-risk for type II diabetes compared to those not at-risk. An independent samples t-test determined no difference between groups. Hypothesis 1 was supported.

Hypothesis 2 stated that nutrition knowledge related to diabetes would not differ between participants at-risk and those not at-risk. An independent samples t-test determined no difference between groups. Hypothesis 2 was supported.

Hypothesis 3 stated that accuracy of nutrition knowledge when self-rating diet as "healthy" or unhealthy" would not differ between groups. An independent samples t-test determined no difference between groups. Hypothesis 3 was supported.

Hypothesis 4 stated there would be no difference in self-ratings of nutritional intake between students at-risk and students not at-risk. An independent samples t-test determined no difference between groups. Hypothesis 4 was supported.

Twenty questions related to nutrition, health, or diabetes were asked. Thirty-six participants were categorized as at-risk with an average mean score of ~77% correct (Std. Deviation .36), and twenty-two participants not at-risk had an average mean score of ~78% correct (Std. Deviation .21). Those participants at-risk for type II diabetes scored a total average of 1% less for correct scores compared to those not at-risk. The research also indicated that the participants who self-rated themselves as highly knowledgeable in nutrition did not show a significant difference in having more correct answers than those who self-rated as less knowledgeable. See Table 2. (Refer to Appendix F for data)

Table 1. Percentage of correct answers

Correct Answers	At Risk	Not At-risk
40%	0	1
60%	1	1
65%	6	0
70%	5	1
75%	7	7
80%	8	5
85%	4	5
90%	4	0
95%	1	2

Correlations for selected variables were run to determine Pearson product-moment correlations, providing insight into relationships among these variables.

Table 2. Intercorrelations among general nutrition knowledge and self-identified risk-factors

Variables		1	2	3	4	5	6	7	8	9
1.	X1	-	.36**	.64**	.29*	.06	.10	-.22	-.17	-.18
2.	X2	-	-	.35**	.02	-.06	-.10	.06	.04	.17
3.	X3	-	-	-	.22	-.02	-.06	-.01	.05	.07
4.	X4	-	-	-	-	.40**	.48**	-.78**	.50**	-.51**
5.	X5	-	-	-	-	-	.45**	-.68**	.64**	-.58**
6.	X6	-	-	-	-	-	-	-.71**	.47**	-.83**
7.	X7	-	-	-	-	-	-	-	-.80**	.69**
8.	X8	-	-	-	-	-	-	-	-	.58**
9.	X9	-	-	-	-	-	-	-	-	-

Key: **significant at the 0.01 level
 *significant at the 0.05 level

Variables #1-3 represent questions 1-3 in Section 1,
  1 = Self-rating on education level for risk factors for type II diabetes
  2 = Self-rating on ability to differentiate between type I and type II diabetes
  3 = Self-rating on knowing methods to deter development of type II diabetes
Variables # 4- 9 represent Section 4
  4 = Self-identified risk factor(s) for type II diabetes
  5 = Self-rated overweight/obese risk factor
  6 = Self-identified diet as risk factor
  7 = Total number of risk factors
  8 = Self-identified if there was more than one risk factor
  9 = Self-identified if diet was healthy/unhealthy

The correlation matrix presents a picture of lack of interrelationships among variables determining *being at risk for Type II diabetes* and presentation of self as having been educated on diabetes-related information. Those who self-identified as at risk for Type II diabetes did not endorse items that indicated they had been educated on information basic to an understanding of diabetes. Perhaps most importantly, they did not endorse the item, knowledge of prevention methods to deter development of Type II diabetes. According to the results of this study, crucial knowledge about diabetes and nutrition is lacking in participants who would benefit most from that information.

DISCUSSION

The findings of this study indicate that basic nutrition knowledge, serving sizes, and general information related to type II diabetes are not clearly understood by college students whether at-risk or not at-risk for type II diabetes. Several explanations could be proposed to account for this lack of knowledge including media bombardment, socioeconomic environment, education level of parents or guardians, and lack of exposure to a nutritional health curriculum. The causes of the low levels of nutrition knowledge are of less significance than the corrections and implementation of knowledge that can lead to healthy behavior and lifestyle changes. Diet has an important role in preventing diseases, influencing healthy behavior, and enhancing the quality of one's life. The previous pilot study and this study function as opportunities to influence change in areas that may have negative impacts on health, and create an area of continued research. See Appendix E for "cause and effect" model.

Limitations of the study and future research

Limitations include the small number of students included in the study sample. Participants in this study were upper division psychology students. Subsequent studies could include students in health science, nutrition, and nursing, disciplines that include the study of nutrition.

The scope of focus in this study was limited to a small number of nutrition issues (i.e., serving sizes, etc). Subsequent research could expand the numbers of nutrition issues that are surveyed. A greater number of items pertaining to prevention of and living with Type II diabetes could be included in subsequent studies.

The study could be strengthened by use of a Dietary Log to provide information to supplement survey data. Participants may have been asked to do a 24-hour dietary recall or 3-day diet log in order to supplement the survey results and confirm the answers chosen on the survey. These changes may have provided more detailed results.

Items the survey instrument did not address may be included in subsequent studies that focus on risk factors not being addressed in the popular media or public school education with respect to Type II diabetes. It is recommended that further research be conducted with larger samples across regional college campuses to understand how changes can be made to health education curriculum, prevention, or intervention classes relevant to type II diabetes on campus or in the community at large.

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