The Effect of Knowledge, Behaviors, and Attitudes Toward Dietary Fatty Acids on Blood Lipid Levels

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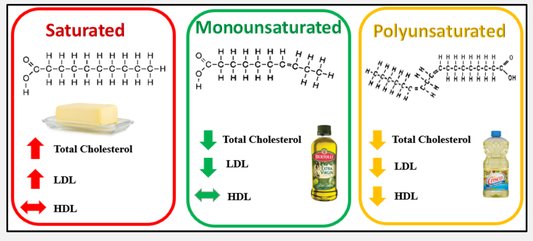
ABSTRACT

Background: Research has shown a strong relationship between dietary fatty acids (FAs) and their impact on blood cholesterol. Few studies have examined knowledge, behaviors and attitudes (KBA) towards dietary FAs impact blood lipid levels.
Objective: To determine: 1) KBA of FAs using the modified General Nutrition Knowledge Questionnaire (GNKQ); and 2) correlations between anthropometric data, GNKQ responses, and blood lipid levels.
Design: This study utilized a cross-sectional research design.
Methods: Upon IRB approval, 104 women ages 18-40yr consented and completed the modified GNKQ via Qualtrics®. The GNKQ consisted of 70 questions and took approximately 15min to complete. Additionally, a subset of nine women also were instructed to fast for 12-15hrs prior to testing at the Obesity Prevention Laboratory at TCU. Height (cm), weight (kg), BMI (kg/m2), waist-to-hip ratio were recorded. Next, a fasting blood sample (5mL) was obtained. The blood samples were sent to AnyLabTestNow® (Fort Worth, Texas) for a lipid panel. Results were then analyzed via IBM SPSS® (Statistics Version 25.0. Armonk, NY). Significance was set at $p<0.05$.
Results: More than 80% of participants were aware of saturated, monounsaturated, and polyunsaturated FAs, but only 33.3% were able to identify their proper food sources. Of the 34 knowledge-based questions, approximately 1.9% demonstrated poor knowledge (answered 0-11 questions correctly), 54.3% moderate knowledge (12-23 questions correctly), and 43.8% strong knowledge (24-34 questions correctly). For the subset, there was a significant negative correlation between LDL and participants who self-reported consuming less or maintaining current consumption of animal fat ($r= -0.725$, $p=0.027$). There were no other significant correlations between KBA and lipid panel results.
Conclusion: Despite self-reported awareness, participants lack knowledge of dietary FAs. The subset results showed strong correlation between LDL and consumption of animal fat representing the relationship between diet and lipid levels. Overall, more research should ensue with a larger sample.

INTRODUCTION

- The leading cause of death in the US is heart disease. A balanced diet, physical activity, cessation of smoking, and an optimal lipid profile is recommended as preventative measures.
- Blood lipid profiles are directly related to dietary fatty acid consumption; however not all fatty acids are created equally and have varying impacts on cholesterol levels as shown below.



Purpose

- To determine: 1) knowledge, attitudes, and behaviors of dietary fats using the modified General Nutrition Knowledge Questionnaire (GNKQ); and 2) correlations between anthropometric data, GNKQ responses, and blood lipid levels.

HYPOTHESIS

We hypothesized that the more knowledge an individual has of dietary fatty acids, the less adverse their blood lipid levels will be.

METHODS

Study Design: This research project was a correlational cross sectional design and was IRB approved. A modified GNKQ was used consisting of 70 questions classified into three categories: knowledge, awareness, or behavior-based.

Participant Characteristics:

- 107 women, ages 18-40yr completed the GNKQ – 3 were excluded.
- A subset of 10 women completed the lipid panel – 1 was excluded.

Study Protocol:

- Participants were given two options depending on their availability.

Option #1
- Complete the GNKQ

Option #2
- Complete the GNKQ
- Measurements
- Overnight fasting lipid panel

- The GNKQ was completed via Qualtrics® and took approximately 15min to complete. For option #2, appointments were scheduled in 15min increments.
- **Measurements:** weight, height, waist-hip ratio, lipid panel. All measurements and blood draws took place at the Obesity Prevention Lab at Texas Christian University.

SURVEY

RESULTS

Table 1: GNKQ Participant Characteristics

Mean Age (yr)	25 ± 7.3
Mean Weight (kg)	61.1 ± 31.6
Minimum Weight (kg)	45.5
Maximum Weight (kg)	104.5

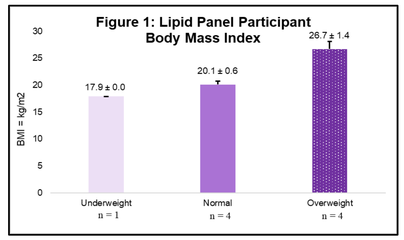


Table 2: Lipid Panel Participant Characteristics

Age (yr)	19.6 ± 1.5
Height (cm)	164.6 ± 6.1
Weight (kg)	61.1 kg ± 10.8
BMI	22.5 ± 3.7
Waist/Hip Ratio	0.74 ± 0.01

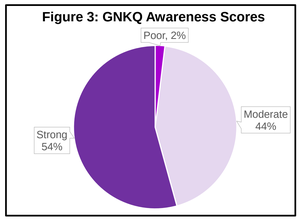


*Figure represents the awareness scores given to the participants once completing the GNKQ. Poor awareness was characterized by answering 0 to 11 questions correctly, moderate awareness by answering 12 to 23 questions correctly, and strong awareness by answering 24 or more questions correctly. The mean score was 69.7%.

Table 3: Awareness Score

Classification	Questions Answered Correctly
Poor	0 to 11
Moderate	12 to 23
Strong	24 to 34

*Table represents the awareness scoring criteria based on the number of knowledge based questions an individual answered correctly. Of the 104 women who took the GNKQ the mean score was a 69.7% with only one individual answering all of the 34 knowledge based questions correctly, a senior Nutrition major at Texas Christian University.

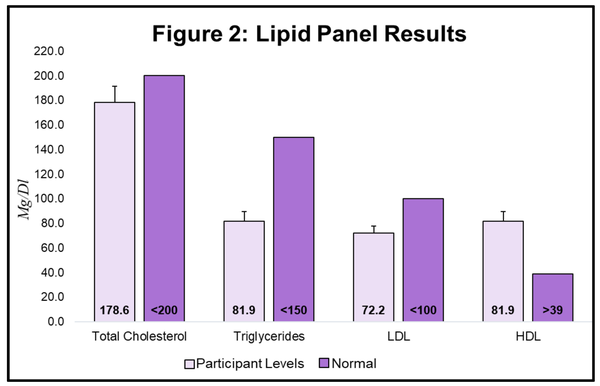


*Figure represents the mean measurements for the subset participants compared to the normal levels. Total Cholesterol, Triglycerides level, Low Density Lipoprotein (LDL), and High Density Lipoprotein (HDL) are represented. Normal Levels established by Mayo Clinic are portrayed in green and the participants' mean measurements are portrayed in orange. All values are milligrams per deciliter (mg/dl).

Table 4: Awareness vs. Knowledge

	Reported Awareness	Correctly Identified
Saturated Fat	99.1%	44.9%
Trans Fat	99.1%	74.8%
Monounsaturated Fat	73.6%	25.2%
Polyunsaturated Fat	73.8%	30.8%

Table 5: Experts Recommend…

Question	Answer	Correctly Identified
Eating more fruits and vegetables to prevent heart disease.	TRUE	90.7%
Eating less saturated fat to prevent heart disease.	TRUE	92.5%
To maintain a healthy diet people should cut fat out completely.	FALSE	97.2%

Table 6: Present Knowledge Gaps

Question	Answer	Correctly Identified
Which of the following raises your blood cholesterol levels?	Saturated Fat	46.7%
How many times a week should you consume oily fish like salmon or swordfish?	1 to 2 times	49.5%
Are there any health problems related to the amount of fat in the diet?	*YES*	63.6%

CONCLUSIONS

- Individuals are aware of the different types of fatty acids; however, are unable to correctly identify them in the diet.
- Individuals are aware of the "expert" recommended diet to prevent heart disease; however, when asked higher level questions regarding health concerns and cholesterol in relationship to fat consumption, individuals did not answer correctly
- Future nutrition education and public health awareness should be focused on providing materials geared to these gaps. More research should be done on a larger scale with both males and females.

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