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Knowledge Disparities in Diabetes Mellitus among Undergradute College Students: An Exploratory Study

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Knowledge Disparities in Diabetes Mellitus among Undergraduate College Students
An Exploratory Study

An Honors Thesis submitted in partial fulfillment of the requirements for Honors in the School of Nursing.

By
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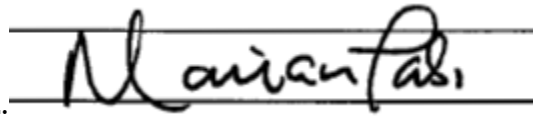
Under the mentorship of Dr. Marian Tabi

ABSTRACT

The primary goal of this research study is to examine the knowledge disparities in diabetes mellitus of health related and non- health related undergraduate majors at Georgia Southern University. The Newest Vital Sign tool is used to assess health literacy between majors. Health related majors will have a higher health literacy score. The research questions to be investigated are (a). do non-health related majors lack an understanding of diabetes mellitus and (b). do all college students have adequate health literacy. With the findings, health education and promotion programs can be established and directed towards the appropriate population.

Thesis Mentor: 

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Knowledge Disparities in Diabetes Mellitus among Undergraduate Students: An Exploratory Study

Diabetes mellitus is a rising chronic condition affecting millions of Americans annually. The aim of this research study is to explore the knowledge disparities of this condition of undergraduate college students at Georgia Southern University and the relationship with the students' majors.

Introduction and Background

Diabetes Mellitus

Diabetes mellitus (DM) is a multifactorial chronic disease causing complications with insulin secretion and production in the pancreas. In 2012, approximately 29.1 million Americans had been diagnosed with diabetes, with 1.4 million new cases each year (American Diabetes Association, 2017). Diabetes mellitus can be classified into Type I or Type II depending on the individual and stage of diabetes. DM often requires insulin therapy, but sometimes proper medication, diet, and exercise eliminate the need for daily insulin (American Diabetes Association, 2004).

Many factors contribute to developing DM, including diet, weight, and environment. Overweight individuals that don't adhere to a healthier lifestyle increase the risk for developing diabetes mellitus. A family history of type I or type II diabetes also puts an individual at a higher risk of developing diabetes (Mayo Clinic, 2014).

Obesity is not a commonly discussed topic on college campuses, but over the past twenty years, it has become more prevalent. With fast food options being less costly and more tasteful, along with the decline in outdoor activities resulting from increased

technology, weight gain is inevitable (Sparling, 2007). In 2014, 22% of college students were overweight and 12% obese (Amuta, Crosslin, Goodman, & Barry, 2016). These individuals are at a higher risk for developing this chronic disease. Lifestyle changes need to be made during the younger adult years in order to prevent the health complications that stem from ineffective health management. College students need education and access to services that will decrease their risk of developing diabetes after or even during college.

Preceding research has been conducted to investigate college students' perceptions of diabetes. One study revealed that 66% of the 400 participants did not know whether or not they were at risk for developing diabetes. The researcher suggested education programs that assessed how an individual perceives their risk for developing this chronic disease. The individual will be more likely to change their health behaviors if they consider themselves susceptible to getting this disease. It may be difficult to change health behaviors if an individual does not see themselves as susceptible to the disease (Reyes-Velázquez & Sealey-Potts, 2015).

In a study conducted at four Texas universities, it was found that obese or overweight female students had a higher chance of becoming a diabetic compared to male students, which could be due to the difference in how females perceive their body image. Also, individuals with a family member diagnosed with type II diabetes had a higher threat appraisal than those without a diagnosed family member. Even though these individuals reported being at risk, they still did not engage in preventative measures (Amuta, Crosslin, Goodman, & Barry, 2016).

Health Literacy

According to the Affordable Care Act of 2010, health literacy (HL) is defined "as the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and services to make appropriate health decisions" (CDC, 2016). Without proper education and understanding of health information, an individual is at an increased risk for making poor health decisions.

In modifying behaviors that put individuals at risk for DM, education and support are necessities. A cross-disciplinary study was conducted to investigate the relationship between health and non-health majors and health literacy. Results concluded that 88% of students had acceptable health literacy as defined by a score based off the Newest Vital Sign tool. A score of zero to one indicates limited literacy, while two to three suggests a likelihood of limited literacy. Answering four to six questions correctly implies adequate literacy. The mean score of nursing and health related majors was 3.3, while the score for non-health related majors was 2.9. The researchers suggested that the issue with HL needs be addressed across universities. HL has an impact on many aspects of life including overall well-being and financial status. It was noted that educational material and curriculum needs to be adjusted to fit the needs of students in order to achieve an acceptable health literacy (Joseph, Fernandes, Hyers, & O'Brien, 2016).

Purpose

Explorations into health literacy and knowledge regarding DM disparities are limited. The purpose of this research is to assess present knowledge disparities regarding diabetes mellitus and to also assess students' health literacy. The study was driven by the

comparison between health and non-health related majors. The main questions to be explored through this research are (a) do all non-health related majors lack an understanding of diabetes mellitus and (b) do all college students have an adequate health literacy as evidenced by the Newest Vital Sign tool.

Hypothesis

The aim is to investigate the knowledge deficits of diabetes mellitus among Georgia Southern University students. It is hypothesized that non-health related majors will lack an understanding of DM, as defined by answering less questions correctly about diabetes mellitus than the health-related majors. However, health literacy will not differ between health and non-health related majors.

Significance

The risk for diabetes mellitus can be reduced by recognizing and addressing the modifiable risk factors. College students, primarily traditional students, have the opportunity to achieve their optimal health during young adulthood. The late teenage years and early twenties can be a chance to develop a healthy lifestyle or go down a road that leads to future health complications.

However, it is difficult to achieve a healthy lifestyle while in college. Healthier foods are more expensive and not suitable for a minimum wage budget or a college student’s demanding schedule. Exercise takes a spot on the backburner when studies become more important. The social life surrounded with drinking often replaces recreational activities outdoors that promote health.

There is currently a lack of knowledge regarding health literacy, more specifically diabetes mellitus. Many patients with diabetes are hospitalized due to complications from

their disease. Students are unaware of the control they have on preventing these complications from occurring. For example, a non-compliant diabetic is at an increased risk for developing a severe infection that could lead to sepsis. However, this could be largely avoided if the person followed the recommended therapies. Therefore, students need education on diabetes mellitus, especially non-health related majors who have never been exposed to the disease and its risk factors.

Design and Methods

This study was a descriptive qualitative and quantitative design. Participants were asked to complete a written or online survey composed of questions that assessed the basic knowledge of DM as well as the Newest Vital Sign tool that assessed health literacy (See Appendix A).

This study was conducted at Georgia Southern University. It was approved by the institutional review board. Participants provided consent before completing the survey online and consent was implied when completing the paper survey. Qualifying participants were over the age of 18 and enrolled at Georgia Southern University as an undergraduate. A total of ninety-nine surveys were collected, and all data was utilized. Thirty-five responses were collected via paper survey, and the remaining were collected online through Qualtrics.

Instrument Description

A survey consisting of five sections will assess individuals' health and knowledge of diabetes mellitus, as well as health literacy. Questions will be designed to assess participants' perceptions of DM. The survey will assess if participants have contact with individuals with DM, personal experience with DM, and/or at-risk for DM. The

knowledge of diabetes mellitus will be determined by the number of correct answers to questions about DM.

The Newest Vital Sign tool is incorporated to grade overall health literacy to determine the relationship between HL and type of major (health related or non-health related). The NVS tool is composed of an ice cream nutrition facts label. Questions assess the ability to interpret the facts and are graded based on number of correct answers. Data collected will be analyzed through SPSS Statistics, and the participants' responses will be coded numerically to reveal the analysis.

The literature supports that individuals with a health major will have a better understanding of health literacy due to content learned in class and exposure to healthcare setting Joseph, Fernandes, Hyers, & O'Brien, 2016). The Newest Vital Sign tool is used to score health literacy, and will determine the difference in HL between health and non-health related majors

Data Analysis and Results

The researcher analyzed the data using IBM SPSS statistics software. Descriptive statistics were used when analyzing demographic data. Cross tabulations were computed when identifying significant relationships in the data set. A comparison between health and non-health majors and health literacy score was conducted through cross tabulations and is presented in bar graph form.

A total of ninety-nine undergraduate students at Georgia Southern University participated. Table 1 shows that of the participants, twelve were male and eighty-seven were female. Fourty-eight of the respondents reported living in a rural community and 51 reported living in an urban setting. 90.9% of the participants were Caucasian with the

remaining 9.1% being African American, Pacific Islander, or Latino/Hispanic. The most important demographic data was major. According to Table 2, fifty-seven of the participants reported being a health major and forty-two reported being a non-health major.

Table 1

		Frequency	Percent
Valid	MALE	12	12.1
	FEMALE	87	87.9
	Total	99	100.0

Table 2

		Frequency	Percent
Valid	HEALTH MAJOR	57	57.6
	NON-HEALTH MAJOR	42	42.4
	Total	99	100.0

The second section of the survey was composed of eleven yes or no questions. As shown in Table 3, when asked "Have you ever heard of diabetes mellitus," 65.7% of health majors chose yes while only 34.3% of non-health majors chose yes. In Table 4, 58.6% of health majors stated that diabetes mellitus was a preventable disease and only 41.4% of non-health majors stated that it was a preventable disease. There are notable differences in health and non-health majors' answers to this section of questions.

Table 3

Have you ever heard of diabetes mellitus? * Are you a health major or non-health major?			
	Are you a health major or non-health major?		
	HEALTH MAJOR	NON-HEALTH MAJOR	Total

Have you ever heard of diabetes mellitus?	YES	Count	46	24	70
		% within	65.7%	34.3%	100.0 %
	NO	Count	11	18	29
		% within	37.9%	62.1%	100.0 %
Total		Count	57	42	99
		% within	57.6%	42.4%	100.0 %

Table 4

Type II diabetes is a disease that is preventable. * Are you a health major or non-health major?					
			Are you a health major or non-health major?		
			HEALTH MAJOR	NON-HEALTH MAJOR	Total
Type II diabetes is a disease that is preventable.	YES	Count	51	36	87
		% within	58.6%	41.4%	100.0%
	NO	Count	6	6	12
		% within	50.0%	50.0%	100.0%
Total		Count	57	42	99
		% within	57.6%	42.4%	100.0%

The third section of the survey tool was composed of four multiple choice questions. The questions assessed general knowledge about diabetes mellitus in regards to age of onset, sexes affected, characteristics of the disease, and course of disease. The population most affected by diabetes mellitus is the middle-aged and elderly. Responses to this question are displayed in Table 5. A small number of health majors, 30.3%, answered this question correctly. However, only 19.2% of non-health majors answered this question correctly. 25.3% of non-health majors stated that the disease was characterized by high blood sugar, as shown in Table 6. Only 8.1% health majors

answered the question about characteristics of the disease incorrectly. 17.2% of non-health majors answered the question incorrectly. When asked about the course of DM, the majority, 91.9%, of respondents chose “lifelong, controlled with treatment.” Table 7 shows all responses to this question.

Table 5

What age groups are most commonly affected by diabetes? * Are you a health major or non-health major?					
			Are you a health major or non-health major?		
			HEALTH MAJOR	NON-HEALTH MAJOR	Total
What age groups are most commonly affected by diabetes?	CHILDREN AND ADOLESCENTS	Count	7	10	17
		% of Total	7.1%	10.1%	17.2%
	YOUNG ADULT AND MIDDLE AGED	Count	19	13	32
		% of Total	19.2%	13.1%	32.3%
	MIDDLE AGED AND ELDERLY	Count	30	19	49
		% of Total	30.3%	19.2%	49.5%
	DON'T KNOW	Count	1	0	1
		% of Total	1.0%	0.0%	1.0%
Total		Count	57	42	99
		% of Total	57.6%	42.4%	100.0%

Table 6

Which of the following best characterizes this disease? * Are you a health major or non-health major?					
			Are you a health major or non-health major?		
			HEALTH MAJOR	NON-HEALTH MAJOR	Total
Which of the following best characterizes this disease?	HIGH BLOOD SUGAR	Count	49	25	74
		% of Total	49.5%	25.3%	74.7%
	LOW BLOOD SUGAR	Count	7	16	23
		% of Total	7.1%	16.2%	23.2%
	LOW URINE SUGAR	Count	1	1	2
		% of Total	1.0%	1.0%	2.0%

Total	Count	57	42	99
	% of Total	57.6%	42.4%	100.0 %

Table 7

What is the course of this disease? * Are you a health major or non-health major?					
			Are you a health major or non-health major?		
			HEALTH MAJOR	NON-HEALTH MAJOR	Total
What is the course of this disease?	CURES BY ITSELF	Count	1	1	2
		% of Total	1.0%	1.0%	2.0%
	SHORT, CURED WITH TREATMENT	Count	3	3	6
		% of Total	3.0%	3.0%	6.1%
	LIFELONG, CONTROLLED WITH TREATMENT	Count	53	38	91
		% of Total	53.5%	38.4%	91.9%
Total		Count	57	42	99
		% of Total	57.6%	42.4%	100.0%

Health literacy was assessed by asking a set of six questions based off the Newest Vital Sign tool. After respondents answered the six questions, a total score was calculated based off number of correct answers. A score of zero to one indicated limited literacy where two to three correctly answered questions suggested limited literacy. Answering four to six questions correctly is sufficient for adequate literacy.

Table 8 shows the relationship between health literacy and health vs. non-health majors. The lowest score was two with the highest being six. Health majors had 9.1% limited literacy and 38.5% adequate literacy. Non-health majors revealed 13.1% limited literacy and 29.3% adequate literacy. Graph A reveals the health literacy of all participants categorized by health and non-health majors. A comparison of means was

computed and is shown in Table 9. The mean health literacy score for health majors was 4.8596 with a standard deviation of 1.2502. Non-health majors had a health literacy mean of 4.4762 with a standard deviation of 1.25403. The average health literacy of all participants was 4.6970.

Table 8

Are you a health major or non-health major? * Newest Vital Sign Score								
			Newest Vital Sign Score					
			2	3	4	5	6	Total
Are you a health major or non-health major?	HEALTH MAJOR	Count	1	8	10	17	21	57
		% of Total	1.0%	8.1%	10.1%	17.2%	21.2%	57.6%
	NON-HEALTH MAJOR	Count	2	11	4	15	10	42
		% of Total	2.0%	11.1%	4.0%	15.2%	10.1%	42.4%
Total		Count	3	19	14	32	31	99
		% of Total	3.0%	19.2%	14.1%	32.3%	31.3%	100.0 %

Graph A

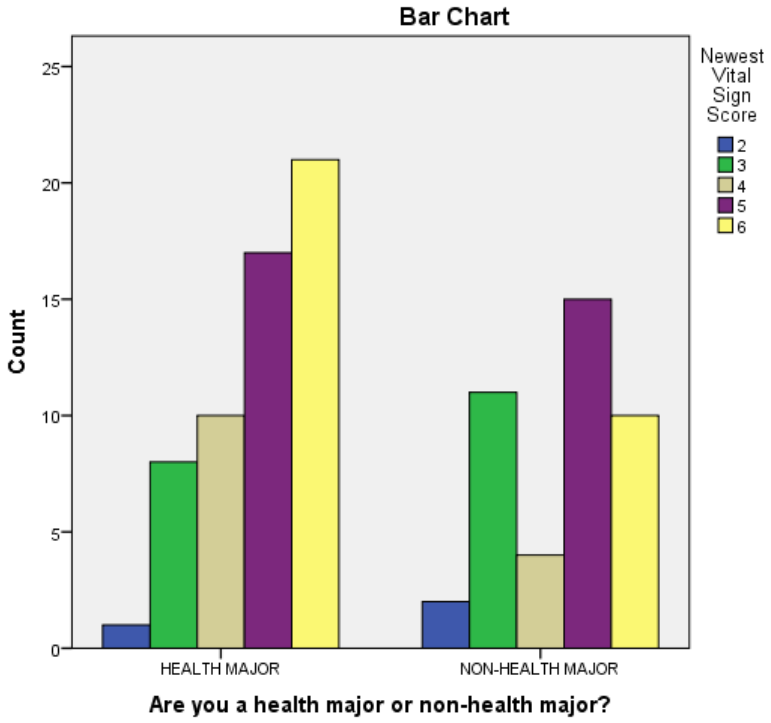

Table 9

Newest Vital Sign Score			
Are you a health major or non-health major?	Mean	N	Std. Deviation
HEALTH MAJOR	4.8596	57	1.12502
NON-HEALTH MAJOR	4.4762	42	1.25403
Total	4.6970	99	1.19056

Discussion

As shown by the data, non-health majors do lack an understanding of diabetes mellitus. A surprising amount of non-health majors reported never hearing about diabetes mellitus. These participants answered fewer questions correctly about diabetes mellitus than the health related majors. Non-health majors may not be exposed to this disease as much as health majors. Education and prevention strategies should be directed towards these students to help them better understand this growing epidemic.

Health literacy slightly differed between health and non-health majors. Health majors, as expected, had higher average health literacy than non-health majors. The average health literacy indicates adequate health literacy for college students.

With these findings, teaching strategies can be developed to educate college students about diabetes mellitus and other chronic diseases. As shown, students have sufficient health literacy. They are able to read and comprehend information, but they lack knowledge and contact with diabetes mellitus.

Strengths and Limitations

Limitations of this study include a small sample size which represents a larger population of undergraduate students at Georgia Southern University. The majority of the participants were female. Another limitation was administration of the survey. The survey was distributed to several participants in person and the rest took the survey online via Qualtrics. It was not advertised or encouraged as much as it should have been. Strengths of this research include variation of majors. Almost half of the respondents were non-health majors and the remaining were health majors. This research would benefit more with a larger population size and more variation among genders and ages.

Conclusion and Recommendations

This research discovered that non-health related majors lack an understanding of diabetes mellitus. It confirmed that college students do have adequate health literacy as evidenced by Newest Vital Sign scores. There was no significant difference noted in health and non-health majors' health literacy scores. This research would be most beneficial when creating educational programs and teaching materials regarding diabetes mellitus. It has identified several areas of lacking knowledge.

The researcher recommends more studies be conducted on this topic. Diabetes mellitus is a growing epidemic and the college population is at a greater risk than ever before. With adequate health literacy, college students are capable of being taught about this disease and how to reduce their risks.

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Appendix A

Knowledge Disparities in Diabetes Mellitus among Undergraduate College Students An Exploratory Study

The purpose of this study is to investigate the lack of knowledge of diabetes mellitus in undergraduate college students. By completing this survey, you are giving providing passive consent. Please return the survey to the researcher if you do not want to participate. Please to not put any personal identifiers on this survey as to protect confidentiality of information.

Section 1

Please answer the following by checking the box or filling in the space provided.

1. Gender
   - □ Male
   - □ Female

2. Weight: _____

3. Height: _____

4. Age
   - □ 18-19
   - □ 20-21
   - □ 22-23
   - □ 24-above

5. I live in a(n):
   - □ Rural area
   - □ Urban area

6. Are you a health major or non-health major?
   - □ Health major
   - □ Non-health major

7. Race (select one):
   - □ Caucasian
   - □ African American
   - □ American Indian
   - □ Pacific Islander
   - □ Latino/Hispanic
   - □ Other
   - □ Prefer not to answer.

8. Date of most recent doctor's visit: _____

9. Date of last physical exam: _____

Section 2

Please check the best answer.

1. Have you ever heard of diabetes mellitus?
   - □ Yes
   - □ No

2. Do you know an individual with diabetes mellitus?
   - □ Yes
   - □ No

3. Have you ever been diagnosed with diabetes mellitus?
   - □ Yes
   - □ No

4. Have you ever checked your blood sugar?
   - □ Yes
   - □ No

5. Have you ever had your blood sugar check by a health care provider?
   - □ Yes
   - □ No

6. Type II diabetes is a disease that is preventable.
   - □ Yes
   - □ No

7. There most common type of diabetes is Type II diabetes.
   - □ Yes
   - □ No

8. Diabetes mellitus can be managed through diet and exercise.
   - □ Yes
   - □ No

9. Type II diabetes is caused by the body's inability to process insulin correctly.
   - □ Yes
   - □ No

10. Only overweight individuals are at risk for diabetes mellitus.
    - □ Yes
    - □ No

11. If an individual with diabetes mellitus has a normal blood sugar reading, they are cured.
    - □ Yes
    - □ No

Section 4

Please place the correct answer in the blank.

____ 1. What age groups are most commonly affected by diabetes?

a. Children and adolescents
b. Young adult and middle aged
c. Middle aged and elderly
d. Don't know

____ 2. Which sexes are affected by diabetes?

a. Males only
b. Females only
c. Both
d. Don't know

____ 3. Which of the following best characterizes this disease?

a. High blood sugar
b. Low blood sugar
c. Low urine sugar
d. Don't know

____4. What is the course of this disease?

a. Cures by itself
b. Short, cured with treatment
c. Lifelong, controlled with treatment
d. Don't know

Section 5

Please circle the correct answer(s).

____ 1. What do you think are the most common signs or symptoms of diabetes mellitus? *Select all that apply.*

a. Frequent urination
b. Frequent hunger
c. Frequent thirst
d. Asymptomatic
e. Don't know

____ 2. What are common complications resulting from diabetes mellitus? *Select all that apply.*

a. Eye problems
b. Kidney problems
c. Cardiovascular (heart) disease
d. Recurring infection
e. Don't know

____ 3. What measure can prevent diabetes? *Select all that apply.*

a. Healthy diet
b. Regular exercise
c. Weight control
d. Quit smoking
e. Don't know

____4. What are the methods of treatment for diabetes mellitus? *Select all that apply.*

a. Drugs
b. Insulin
c. Healthy diet
d. Regular exercise
e. Weight control
f. Quit smoking
g. Don't know

Section 5

Please use the ice cream label to answer the following questions.

Nutrition Facts

Serving Size	½ cup
Servings per container	4
Amount per serving	
Calories 250	Fat Cal 120
	%DV
Total Fat 13g	20%
Sat Fat 9g	40%
Cholesterol 28mg	12%
Sodium 55mg	2%
Total Carbohydrate 30g	12%
Dietary Fiber 2g	
Sugars 23g	
Protein 4g	8%

*Percentage Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Ingredients: Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.

1. If you eat the entire container, how many calories will you eat?

_____

2. If you are allowed to eat 60 grams of carbohydrates as a snack, how much ice cream could you have?

_____

3. Your doctor advises you to reduce the amount of saturated fat in your diet. You usually have 42 grams of saturated fat each day, which includes one serving of ice cream. If you stop eating ice cream, how many grams of saturated fat would you be consuming each day?

_____

4. If you usually eat 2,500 calories in a day, what percentage of your daily value of calories will you be eating if you eat one serving?

_____

Pretend you are allergic to penicillin, peanuts, latex gloves, and bee stings.

5. Is it safe for you to eat this ice cream?

□ Yes

□ No. Why?

_____

___

_____

___