

**REGISTERED DIETITIANS' RECOMMENDATIONS FOR NUTRITION
EDUCATION AND INTERPROFESSIONAL EDUCATION
IN MEDICAL SCHOOL CURRICULUM**

By

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ABSTRACT

Background. The prevalence of nutrition-related diseases has created a need for increased nutrition education in medical school curricula. Incorporating nutrition education into medical school programs is likely to increase physicians' ability to provide nutrition advice and increase advocacy for healthy lifestyles.

Objective. The purpose of this study was two-fold: 1) to determine Registered Dietitians' (RDs) perceptions of nutrition knowledge; and 2) to determine the interprofessional practice of physicians.

Methods. A 27-question electronic survey was developed and distributed to a Survey Monkey link through email, social media and word-of-mouth communication following IRB approval. Inclusion criteria includes RD/RDNs currently credentialed with the Commission of Dietetic Registration over the age of 18 years. The investigators used Excel for Mac, Version 16.42 for all data analysis. Statistical significance was set at $p < 0.05$.

Results. The study surveys 64 RDs in Texas. Participants ($n=64$) were 38.3 ± 11.0 and 98.4% ($n=63$) female. 94% ($n=61$) of participants reported feeling comfortable interacting with or providing nutrition information to physicians in a healthcare team setting. Approximately 30% ($n=19$) of participants rated physicians as expected to well above expected on establishing collaborative relationships with RDs. 78% ($n=50$) of participants reported that they disagreed/strongly disagreed that physicians are well-prepared to educate their patients in nutrition. 40% ($n=28$) agreed/strongly agreed that physicians discuss nutrition with patients/clients when appropriate.

Conclusions. RDs did not report that physicians were well-prepared to educate patients about nutrition or discuss nutrition with patients when appropriate. RDs reported being comfortable interacting with physicians. The majority of participants reported that physicians meet or exceed expectations for establishing collaborative relationships. Thus, interprofessional teams are valuable in achieving positive patient outcomes.

Keywords: Clinical Competence, Interprofessional Education, Dietitian, Curriculum, Medical School, Nutritional Education, Physician, Registered Dietitian, RD, Doctor, MD, DO

CHAPTER I

INTRODUCTION

Today the prevalence of nutrition-based diseases, such as obesity and cardiovascular disease (CVD), have reached an all-time high.¹ Since the early 2000s, the World Health Organization (WHO) has listed many nutrition-based diseases in their top ten causes of death. Unfortunately, most doctors do not have a strong foundation in nutritional care.² As a result, doctors rely heavily on prescription drugs to treat the symptoms rather than combatting the root causes of patients' diseases. In recent years, the steadily declining rate of cardiovascular mortality has reached a shocking plateau. However, with the help of a stronger nutrition-based approach to treatment via an emphasis on nutrition education, doctors can foster a decline in nutrition-based diseases and promote healthier lifestyles amongst their patients.¹

Fifty-one percent of medical students report that they did not receive adequate nutrition education in medical school.³ Nutrition scholars attribute the lack of emphasis on nutrition in medical school curricula to a shortage of qualified faculty, an absence of collaboration and coordination with nutrition professionals, and an inadequate inclusion of mandatory nutrition-related topics in medical school curriculum.⁴ Incorporating nutrition education into medical school programs across the nation is likely to generate improved health care outcomes for patients, increased physician confidence in nutrition-related issues, and increased advocacy for healthy lifestyles with a myriad of healthcare benefits.^{3,4}

Primary-care physicians are responsible for the ongoing treatment of patients and providing for their general health needs. Due to the lack of nutrition education and training received by medical school students, most physicians report seeing benefits in the outcomes of patients only when a hospital includes a Registered Dietitian (RD) on a healthcare team.⁵ The

purpose of this study is to determine Registered Dietitians' (RDs) perceptions of nutrition knowledge and interprofessional practice of physicians. By understanding the interprofessional relationships as well as the need for knowledge of nutritional sciences, medical schools can develop curricula, which adequately prepare physicians for the nutritional demands of the field.

CHAPTER II

LITERATURE REVIEW

Importance of Primary Health Care

According to the WHO, Primary Health Care (PHC) addresses a person's health needs throughout his or her lifetime, including physical, mental, and social well-being needs. This people-centered approach to health care includes health promotion, disease prevention, treatment, rehabilitation, and palliative care. PCH empowers people to be in control of their own health and health care needs.⁶ Practitioners of PHC seek to reduce the incidence of preventable illness or disease and functions include identifying and controlling prevailing health problems, food supply, and proper nutrition. PHC is an essential part of the healthcare system as it improves the health care for a population at a reduced cost.⁷

Since 1975 the prevalence of obesity has tripled. As obesity is one of the main contributors to heart disease, insulin resistance, type II diabetes, and various other conditions, treating obesity is a key tool for disease prevention. Without lifestyle and nutritional prevention methods, obesity can lead to these comorbidities.⁸ A shift to prevention offers hope for dramatically improving health. As the first line of defense, physicians must be knowledgeable and prepared to implement preventative health care education and techniques to not only lower the rate of preventable diseases, but also to aid in combating healthcare costs.

High Cost of Healthcare

Malnutrition occurs often in hospitalized patients and researchers have associated it with longer hospital stays and worse outcomes.² Physicians have the ability to lower healthcare costs by implementing early nutrition assessments and preventive measures for high-risk patients, thus

helping to stop the progression to more expensive, chronic diseases. The cost of cardiovascular disease in the United States equates to roughly \$351.2 billion, with approximately \$213.8 billion accounting for direct medical costs.⁹ However, effective implementation of various nutritional therapies and lifestyle alterations can easily reduce these costs. For example, scientific studies of diets of the Mediterranean diet and Lyon Diet Heart have documented 30-70% decreases in major cardiovascular incidents, such as stroke, due to changes in a patient's diet.¹⁰ The implementation of nutrition education and practice has enormous potential for creating healthcare savings.¹ Educating and convincing patients of the importance of dietary and lifestyle changes may help them avoid more serious diseases. As a result, patients will need fewer medications, surgeries, and doctor visits, greatly reducing American healthcare costs.

Role of the Physician in Nutrition Care

Most patients see physicians as reliable and trusted sources of information regarding nutrition. Medical students and physicians display positive attitudes towards incorporating nutrition care into practice but lack the confidence in their level of education and knowledge regarding topics related to nutrition care. Research has provided evidence of a lack of nutrition education, training, and physician participation in nutrition care around the world. In a survey of general practitioners and resident doctors in New Zealand, all groups were unsure of their ability to perform specific tasks related to nutrition care, including nutrition assessment and counseling, due to patient motivation.¹¹ Participants reported being confident in their ability to perform basic nutrition-related skills, such as calculating Body Mass Index and explaining the influence of alcohol consumption on overall health, but they were less confident in their knowledge of wellness and disease, macronutrients, micronutrients, nutrition needs for women, infants and

children, and disease management. Physicians need more nutrition education to improve their self-efficacy in nutrition care.¹¹

Twenty-three medical students participated in interviews regarding the role of physicians in nutrition care and nutrition education during medical school. A majority of these students felt that physicians should provide general nutrition care to patients. The students identified several examples of roles that physicians could play in nutrition care, including providing nutrition advice and education, supporting patients to follow healthy diets, collaborating with dietitians, monitoring the progress of nutrition care, and referring patients to dietitians or nutrition professionals.⁴

Lack of Nutrition Education in Medical Schools

Poor nutrition is a primary contributor to the development of chronic diseases. Americans are currently facing an obesity epidemic, and medical schools must adjust in order to prepare physicians to combat this growing problem.¹² Of 121 medical schools responding to a nutrition education survey conducted by Adams, Butsch, and Kohlmeier, only 24.6% reportedly fulfill the National Research Council's recommended 25-hour minimum of nutrition education.² Further, the Association of American Medical Colleges has recently declined to incorporate nutrition into its new blueprint for medical competencies.² The number of medical schools with required nutrition courses has also steadily declined since 2000, as only 18% of responding schools now require nutrition courses. In 2000, 35% of responding schools required such education.² This phenomenon is not new in American medical training. A 1985 National Academy of Sciences study found that nutrition education in American medical schools was grossly inadequate to meet both current (in 1985) and future healthcare demands. Researchers attribute the increasing

neglect of nutrition education to movement by medical schools away from traditional lecture-based learning and toward more clinical, integrated coursework.¹³ Only five percent of responding medical schools actively engage their students in clinical work involving an emphasis in nutrition. Most of the schools that still require nutrition clinical work allocate only 6.4 hours, an insufficient amount of time, to observation of proper nutrition practice.²

A qualitative study of 48 medical students, 14 residents, and 10 physicians demonstrated a lack of nutrition education or training in medical schools. Medical students report that they only “mildly incorporate” nutrition into their curriculum, and physicians also report a lack of training regarding nutrition. Indeed, many patients report that physicians rarely mention nutrition during routine exams.³ The medical students and physicians reported their lack of education regarding nutrition diminished their ability to counsel patients about the importance of nutrition in overall health. Respondents demonstrated a lack of knowledge and experience when asked about certain sub-themes regarding the incorporation of nutrition into medical curriculum.³

Interprofessional Collaboration in Practice

A primary care physician is responsible for a patient’s health care needs. The physician can maximize care for his or her patient by using and taking a leading role in an interprofessional team across many disciplines of healthcare.⁵ Interprofessional collaboration occurs when two or more professions work together to achieve common goals.²⁰ Due to the lack of nutrition education or training for physicians, RDs bring value to this interprofessional team. RDs can provide care for patients with a variety of health conditions and research has shown RDs’ inclusion on an interprofessional team improves patient outcomes.⁵ Research has shown that, for patients admitted to the hospital, nutrition screening, early assessment, and treatment by an RD

can shorten the length of the hospital stay. Additionally, outpatient medical nutrition therapy for patients improves clinical outcomes.¹⁴ RDs can work to improve the health of patients, thereby aligning with the PHC approach. By reducing the need for health care visits or shortening the length of hospital stays for patients, RDs function to reduce the overall cost associated with healthcare.⁵

CHAPTER III

METHODS

Study Design

This inquiry utilizes a cross-sectional, mixed methods study design, through a survey, to solicit recommendations from RDs for nutrition education in medical school curriculum.

Additionally, this study sought to examine and emphasize the role of interprofessional education in medical schooling. The TCU Institutional Review Board conducted a review of this study's protocol and all participants provided electronically informed consent before participating in the study.

The research team distributed the survey, created using SurveyMonkey, through various channels to RDs throughout the state of Texas. Research team members contacted former TCU students. Research team members also contacted Dietetic Internship Directors, regional presidents and dietetic alliance leaders to distribute the survey to their colleges via email. Next, the researchers distributed the survey link via social media platforms. The research team configured the survey settings to not collect the IP addresses of respondents. Researchers did not collect any information that could link a survey back to the participant through the use of anonymous surveys. Participants' names will remain anonymous should any of the findings from this study result in publication. Participants did not have to participate in this survey without penalty or loss of benefits to which they are otherwise entitled. If participants chose to withdraw from the study, they could close out the internet browser to leave the survey. Study results did not include any participant data collected prior to a subject voluntarily withdrawing from the study. The research team will store consent forms and data for three years electronically and destroy them thereafter.

The survey link took participants directly to the online consent form, which required participants to answer “Yes” before beginning. The survey was a qualitatively-designed study in which participants answered 27 survey questions. The questions consisted of multiple choice, Likert scales, and free response questions related to the participants' individual perceptions of physicians': knowledge of dietary nutrient interactions and medications, appropriate referrals to RDs, ability to identify appropriate diets for patients, ability to educate patients in nutrition, and interprofessional care. The survey requested information about five main categories: four questions regarding the RD's background information, five questions regarding professional practice, seven questions regarding perceptions of physician's performance, seven questions regarding physician interprofessional adequacy, and three free response questions. Upon completion of this research project, the investigators analyzed the resulting data with Microsoft Excel and used standard statistical significance to aggregate the data.

Participants

This study included RDs, both men and women 18 years of age or older, in the state of Texas. Inclusion criteria included RDs currently credentialed with the Commission of Dietetic Registration. Through the use of the convenience method of sampling, approximately 64 RDs participated in this cross-sectional study. All involvement was volunteer-based.

Protocol

Research team members sent recruitment emails via professional, educational, and alumni networks. The research team also distributed the survey link through the use of social media

platforms. Each participant was asked to complete a consent form before beginning the survey. The survey consisted of 27 questions and took approximately 10 minutes.

Risks associated with participation in this study were minimal. Participants may have felt uncomfortable providing information regarding their personal experiences interacting with physicians. The participant had the ability to withdraw participation from this study, without penalty, at any point in time.

Statistical Analyses

Participants completed the survey through SurveyMonkey, which recorded the results. Microsoft Excel (Microsoft, Version 16.37 (20051002), Redmond, WA) was used for all data analyses. All values are presented as mean \pm standard error of the mean (SEM) unless otherwise noted. Frequency and percentages were used to describe the characteristics of the sample. Demographic data was cross-tabulated with the collected descriptive statistics to determine whether relationships existed between demographic variables and the survey categories. Statistical significance was set at $p < 0.05$.

CHAPTER IV

RESULTS

Participant Characteristics

Table 1. Participant Characteristics

Characteristic (n= 64)	Number (%)
Mean Age (yr)	38.3±11.0
Gender	
Female	63 (98.4%)
Male	1 (1.6%)
Race/Ethnicity	
Caucasian	55 (85.9%)
African American	3 (4.7%)
Asian	0 (0%)
Other	0 (0%)
Ethnicity	
Hispanic	6 (9.4%)
Mean Time as a RD (yr)	13.1±10.2
Mean Time in Dietetics Field with Direct Patient Care (yr)	10.3±8.6
Current Area of Practice	
Clinical Nutrition - Acute	27 (28.7%)
Food and Nutrition Management	15 (16%)
Clinical Nutrition- Ambulatory Care	12 (12.8%)
Education and Research	10 (10.6%)
Clinical Nutrition- Long-Term Care	8 (8.5%)
Community	8 (8.5%)
Consultation and Business	5 (5.3%)
Outpatient Renal/Dialysis	3 (3.2%)
Private Practice	2 (2.1%)
Pediatric Nutrition	2 (2.1%)
School Nutrition	1 (1.1%)
Outpatient - Eating Disorders/Mental Health	1 (1.1%)

A total of 64 RDs completed the survey regarding their perceptions of physicians' nutrition knowledge and interprofessional practice (see Table 1). Sixty-three of the respondents were female, while the mean age was 38.3±11 years. Fifty-six of the survey respondents were White, six were Hispanic or Latino, and three were African American. Participants have worked

as a RD for an average of 13.1±10.2 years in a variety of practice areas, including various fields of clinical nutrition, food and nutrition management, education and research, and others.

Physician Nutrition Related Knowledge

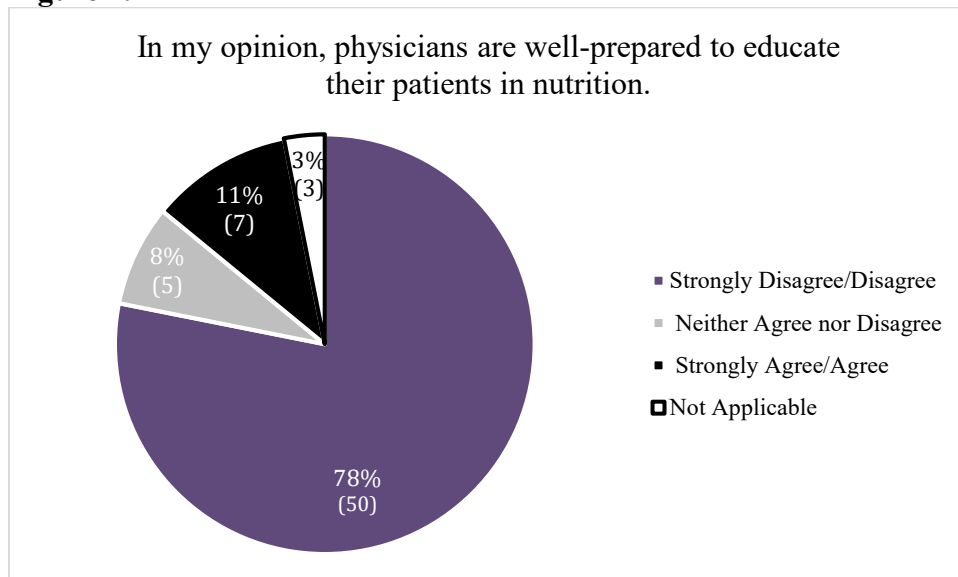
The survey results also provided information regarding the responding RDs perceptions of physicians’ nutrition related knowledge, as shown in Table 2.

Table 2. Physician Nutrition Related Nutrition Related Knowledge

Question	Strongly Agree		Agree		Neither Agree Nor Disagree		Disagree		Strongly Disagree		N/A		Total
1. In my opinion, physicians are well-prepared to educate their patients in nutrition.	0%	0	11%	7	8%	5	45%	29	33%	21	3%	2	64
2. I believe the physicians I am working with are capable of identifying appropriate diets for patients.	2%	1	36%	23	13%	8	31	20	14%	9	5%	3	64
3. In my experience, physicians are knowledgeable on the interactions between dietary nutrients and prescribed medications.	0%	0	25%	16	28%	18	33%	21	8%	5	6%	4	64
4. In my experience, physicians are properly recommending and monitoring dietary supplements.	0	0	9%	6	13%	8	50%	32	20%	13	8%	5	64
5. In my experience, physicians refer patients/clients to RDs when appropriate.	16%	10	49%	31	14%	9	11%	7	6%	4	3%	2	63
6. In my experience, physicians discuss nutrition with patients/clients when appropriate.	2%	1	39%	25	11%	7	38%	24	8%	5	3%	2	64
7. I am comfortable interacting with or providing nutrition information to physicians in a healthcare team setting.	44%	28	48%	31	5%	3	0%	0	0%	0	3%	2	64

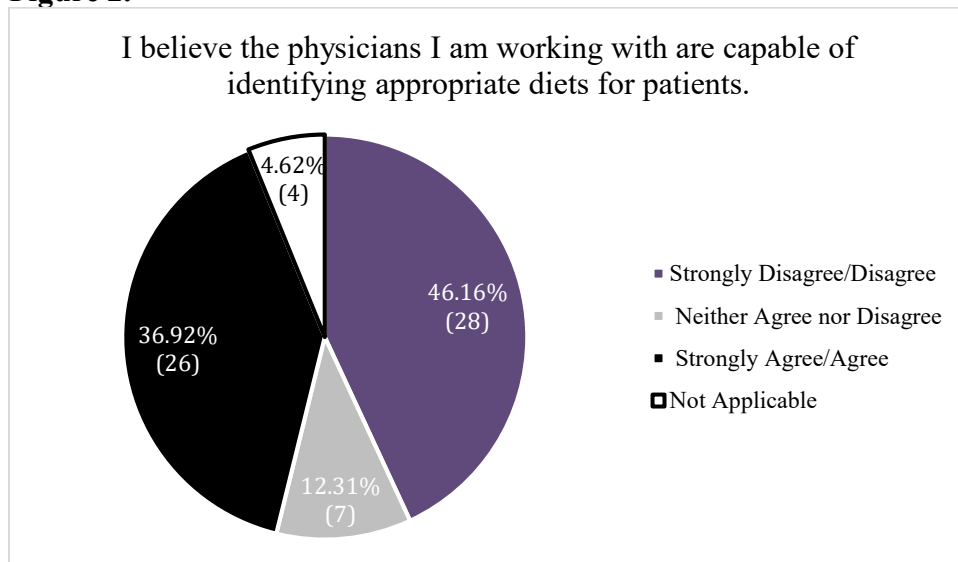
Figure 1 illustrates RD opinion that physicians are not well-prepared to educate their patients in nutrition. Fifty of the responding RDs reported disagreement with the assertion that physicians are currently well-prepared to educate their patients in nutrition, five reported that they neither agree nor disagree, seven agree or strongly agree, two reported that the statement was not applicable to them.

Figure 1.



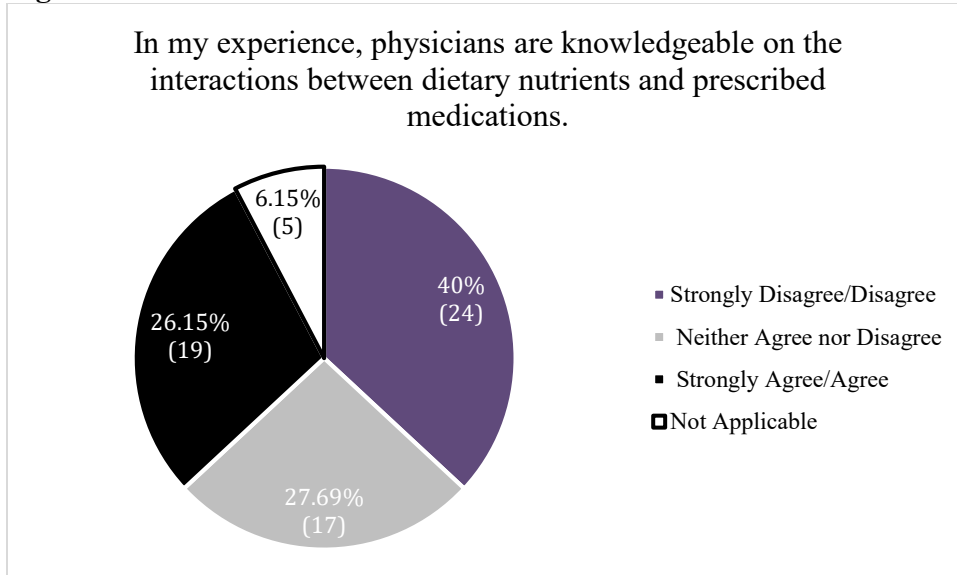
As shown in Figure 2, a majority of RDs believe the physicians they work with are not capable of identifying appropriate diets for their patients. Twenty-eight participants said they disagree or strongly disagree that physicians are capable of identifying appropriate diets for patients; seven report neither agreeing or disagreeing; 26 felt that they agree or strongly agree with the statement; and four reported that this was not applicable to them or their practice.

Figure 2.



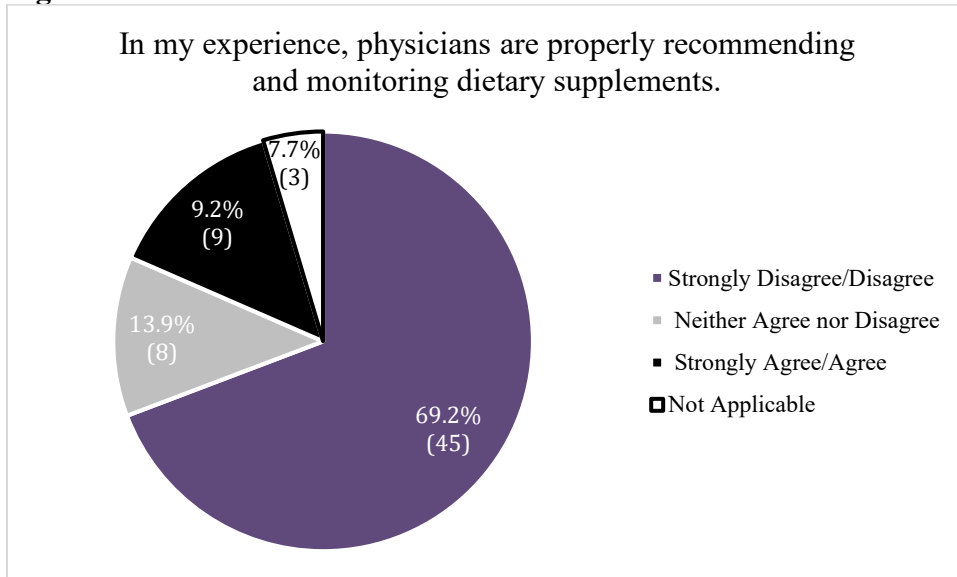
When asked if physicians are knowledgeable on the interactions between dietary nutrients and prescribed medications 24 RDs responded that they disagree or strongly disagree with the statement, 17 neither agree nor disagree, 19 responded that they agree or strongly agree, and four felt that the statement was not applicable to them, as shown in Figure 3.

Figure 3.



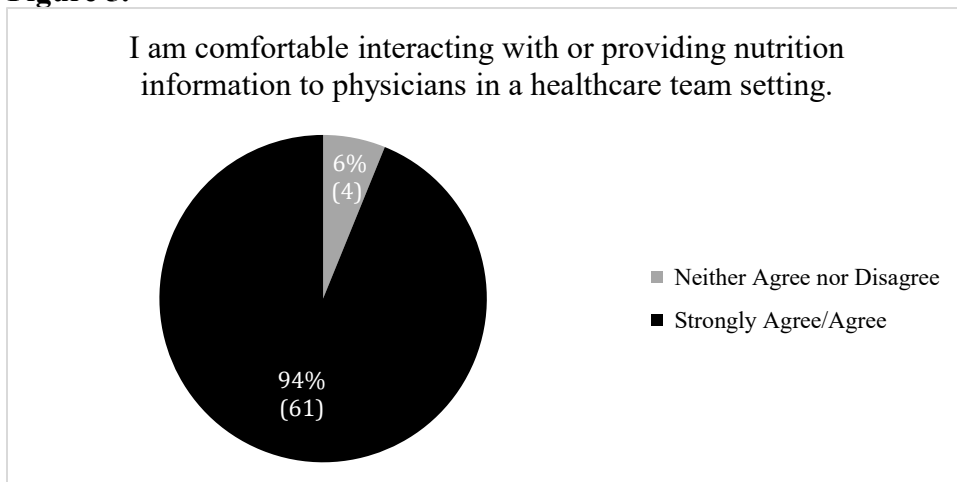
As displayed in Figure 4, RDs do not feel as though physicians are properly recommending and monitoring dietary supplements. Forty-five respondents felt they strongly disagree or disagree that physicians properly recommend and monitor dietary supplements, eight neither agree nor disagree, nine reported that they agree or strongly agree, and three felt that the statement was not applicable to them.

Figure 4.



RDs largely reported feeling comfortable interacting with or providing nutrition information to physicians in a healthcare team setting, 61 of the RDs reported that they agree or strongly agree with this statement, and four reported that they neither agree nor disagree with the statement, as shown in Figure 5.

Figure 5.



When asked in a free-response question, what topics the RDs felt physicians are well-prepared regarding nutrition, 23 declined to answer or reported that they felt physicians were not well-prepared regarding any nutrition-related topics, 14 reported that they feel physicians are well-prepared in general nutrition knowledge, 22 stated diet-specific knowledge, and six reported that physicians are aware of the importance of nutrition support when treating patients or clients.

Interprofessional Practice

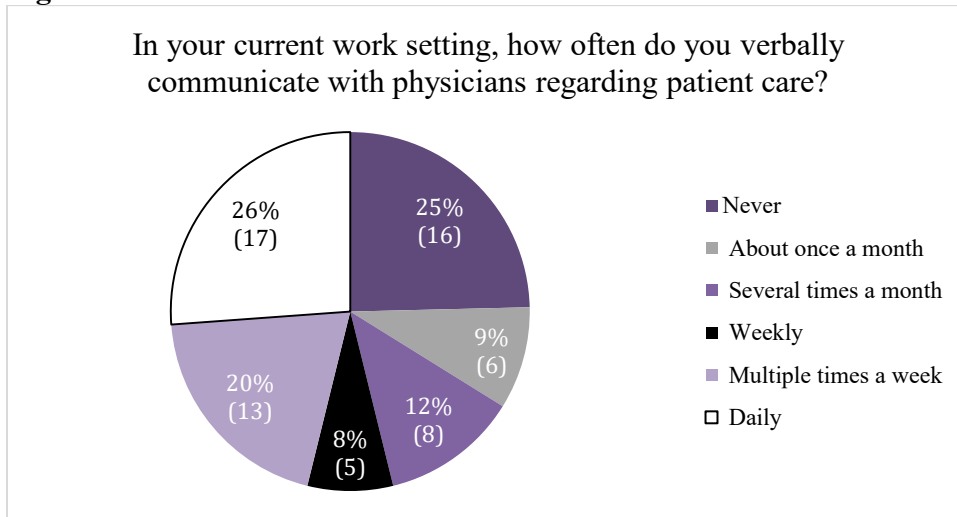
As shown in Table 3, the survey results provided information and results regarding several topics related to interprofessional practice between physicians and RDs. Overall, the responding RDs believe that physicians establish relationships and work well with RDs to maximize patient care.

Table 3. Interprofessional Practice

Question	Well Below Expected		Below Expected		Expected		Above Expected		Well Above Expected		N/A		Total
8. Establishes collaborative relationships with RDs/RDN	3%	2	23%	15	38%	24	19%	12	11%	7	6%	4	64
9. Integrates information and perspectives from others in planning and providing patient/client care.	2%	1	16%	10	45%	29	23%	15	6%	4	8%	5	64
10. Shares evidence-based or best practice discipline-specific knowledge with others.	3%	2	23%	15	39%	25	20%	13	5%	3	9%	6	64
11. Seeks input from patient/client and family.	2%	1	9%	6	48%	31	23%	15	3%	2	14%	9	64
12. Demonstrates recognition of the relationship between team functioning and quality of care.	0%	0	11%	7	42%	27	30%	19	8%	5	9%	6	64
13. Contributes to interprofessional team discussions.	0%	0	11%	7	44%	28	27%	17	9%	6	9%	6	64
14. Seeks the perspectives and opinions of RDs/RDNs.	2%	1	28%	18	36%	23	25%	16	5%	3	5%	3	64

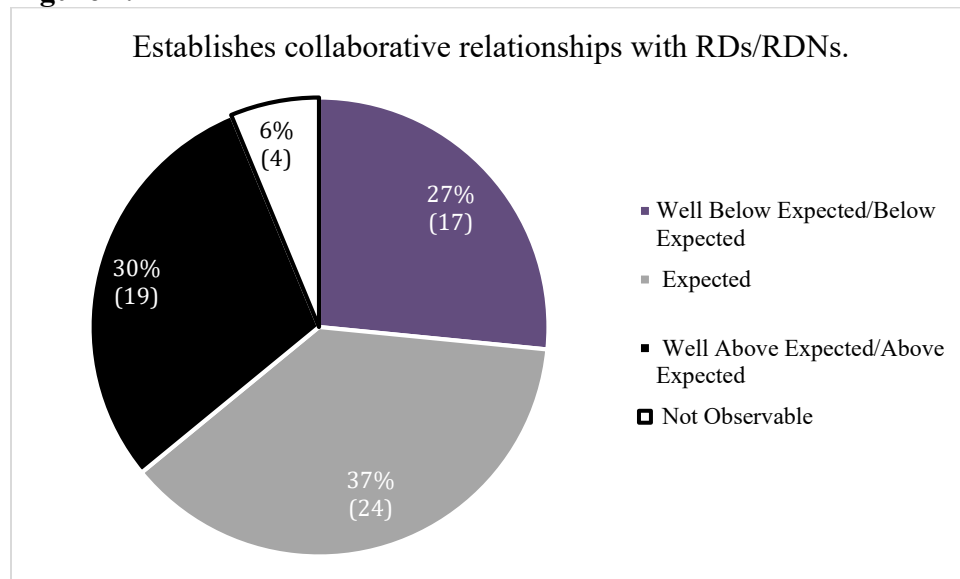
RDs were asked about the frequency with which they verbally communicated with physicians regarding patient care. Sixteen responded never, six responded once a month, eight responded several times a month, five responded weekly, 13 responded once a month, and 17 responded daily, as shown in Figure 6.

Figure 6.



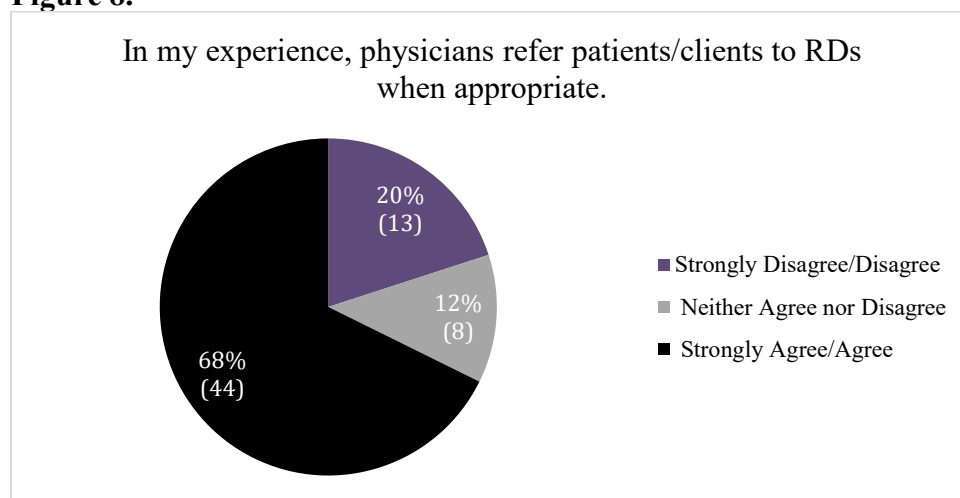
A majority of RDs report that physicians adequately establish collaborative relationships with RDs. Seventeen RDs reported that physicians demonstrate these relationships well below or below the expected level, 24 felt physicians do so at the expected level, 19 reported that physicians demonstrate collaborative relationships above or well above the expected level, and four RDs felt this was not applicable or was not observable to them.

Figure 7.



More than half of the RD participants agreed with the statement that physicians refer patients to RDs when appropriate. Forty-four of the responding RDs reported that they agreed or strongly agree with the statement, eight neither agree nor disagree with the statement, and 13 felt that they disagree or strongly disagree with the statement.

Figure 8.



In a free-response question, participants were asked what they want physicians to know about RDs. Table 4 shows the themes of recorded responses.

Table 4. Free-response: What do you want physicians to know about RDs?

Topic	Number (% of respondents)
RDs are experts in nutrition and health care	26 (40.62%)
RDs are a vital part of a patient’s care team	22 (34.38%)
The role and job descriptions of RDs	6 (9.38%)
Specific nutrition facts	1 (1.56%)
Not stated	9 (14.06%)

The top category of response to this question was the fact that RDs are experts in nutrition and nutrition-related health care. Respondents want physicians to know that RDs receive extensive education and training in the fields of nutrition and health care, with 26 RDs providing an answer related to this topic. Survey participants also want physicians to further utilize RDs as a vital part of a patient’s care team, with 22 RDs answering with a comment related to this topic. According to six responding RDs, another important topic for physicians to know is the role and job description of the RD and how they can be used as a part of a patient’s care team. Finally, one RD responded that they would like physicians to know a specific nutrition fact, and nine survey respondents declined to answer the question.

CHAPTER V

DISCUSSION

Physician Nutrition Related Knowledge

Through the process of surveying sixty-four nutrition professionals, several large trends became apparent relating to medical competencies regarding physicians with nutrition related knowledge. One trend is that RDs do not believe physicians are adequately prepared to educate their patients regarding nutrition. As discussed previously, physicians have the unique ability to considerably lower the overall cost of healthcare expenses in America by implementing primary intervention methods, such as nutrition education. If physicians are not able to relay general nutrition knowledge to their patients, the likelihood of negative health outcomes increases significantly. Physicians, particularly those within family practice, often serve as the first line of defense in the medical field. They are responsible for referring patients to specialists and acting as a guide for patients throughout the process of treatment. Patients tend to be very trusting of their physicians' advice.¹⁶ There is an increased likelihood that a physician will unintentionally offer incorrect nutrition education to their patients due to their lack of adequate nutrition training. In instances when dietitians are unavailable, physicians need to be able to offer general nutrition advice. However, the results reveal that most RDs do not have confidence in doctors' abilities to identify appropriate diets for their patients. Further, RDs largely disagree that physicians discuss nutrition with patients when appropriate. This shows a need for incorporating nutrition training into medical school and clinical curricula so that doctors are prepared for such circumstances as patients rely upon the advice of doctors in addressing medical problems, especially those that are diet-related or can be alleviated through dietary intervention.

Another startling trend is the perception that RDs believe physicians are not aware of the interactive nature between prescribed medicines and dietary nutrients. There are a variety of nutrients that can alter any given drug's overall efficacy, both for better and for worse. For example, tyramine, a nutrient naturally found in protein-rich foods, should not be taken with a monoamine oxidase inhibitor (MAOI), a type of medication typically used to treat depression and anxiety.¹⁵ If a patient consumes foods high in tyramine, such as aged meats or cheeses, while on a MAOI, their tyramine levels spike, thus causing a patient's blood pressure to reach unsafe levels. And this is just one example. If RD opinion is correct, physicians' lack of awareness regarding the interactions between various substances could unintentionally produce dangerous health complications and create barriers to treatment. Alternatively, physician's lack of nutrition knowledge can also prevent doctors from recommending dietary elements which may positively impact a drug's efficacy and overall health outcomes, thereby unknowingly increasing the cost and duration of medical treatment. Not only do the RDs believe physicians are unaware of the interactive nature between medications and nutrients, RDs also believe that physicians are improperly recommending and monitoring dietary supplements. Physicians need to be aware of dietary supplements as they also have the possibility to have negative interactions with medications. With such varying and impactful interactions among substances, it is vitally important that doctors thoroughly understand the health implications of prescriptions and dietary elements. Therefore, it is paramount to begin emphasizing the importance of nutrition education in medical school curricula and adjusting the requirements to graduate from medical programs to include mandatory nutrition education.

These trends display an overall lack of confidence in physician's abilities within a major area of healthcare and overall human well-being. Healthcare professionals need to implement

primary intervention methods, which include nutrition education, to a much greater degree. By not utilizing nutritional preventative measures, physicians are forced to focus on fighting developed diseases rather than preventing disease onset. Through proper education, the trend of physician inadequacies related to diet can be corrected such that doctors are able to properly care for patients. In doing so, the impact of such education may be widespread. In addition to the immediate results reflected in improved health outcomes, secondary effects may reflect a decrease in healthcare costs as the average person is more knowledgeable about and conscious of his or her dietary needs.

Interprofessional Collaboration and Practice

As shown in the results of this study, physicians do not have the nutrition knowledge required to properly advise or council patients regarding the subject. While physicians lack the proper education and training regarding nutrition, RDs receive extensive education and training. To become an RD, one must complete and pass standards for both dietetics education and supervised practice in dietetics.¹⁷ Additionally, after completion of eligibility requirements, RDs must pass the registration examination for dietitians that is administered by the Commission on Dietetic Registration.¹⁷ The free-response questions in the survey show that RDs would like physicians to understand that they are the experts in nutrition and are a vital part of the health care team.

In surveying the RDs, it became apparent that many feel physicians understand, at an expected level, the importance of interprofessional practice and collaborative relationships between physicians and RDs. As previously noted, physicians are not adequately prepared to discuss nutrition with patients, so RDs become a vital part of the primary care team. The

inclusion of RDs into a PHC team increases the overall effectiveness of nutrition care and improves patient outcomes.¹⁸ PHC addresses a person's health needs, which should include nutrition needs, throughout his or her lifetime. Dietetic consultations in PHC can improve various dietary, anthropometric, or clinical outcomes for patients, including glycemic control and weight loss.¹⁸ As a member of the multidisciplinary care team, it is imperative that RDs be physically located within the practice or health care facility and have access to patients' health records, so they can deliver the necessary nutrition care to patients.¹⁹ While the RDs responded to the survey that physicians utilize interprofessional care and establish collaborative relationships with RDs, many also report difficulty in developing relationships with physicians.¹⁹ RDs must be treated as a crucial part of the healthcare team and receive all necessary materials to maximize the benefit of care and improved outcomes that they can provide to patients.

Limitations

A key limitation for this study is the small population size as only sixty-four RDs responded to the survey. Though Texas is rather diverse, participants were also recruited from a restricted geographical area, the state of Texas and may not be representative of the entire nutrition and health care field throughout the country. Further, due to the voluntary status of the survey, it may contain a self-selection bias. While this reality certainly presents a limitation, the opinions are offered by professionals within the industry, providing a candid view of the current state of nutrition in medicine. Another strength of this study is the heavy use of Likert scales in collecting data. This allows for better analysis of RD opinions through the provision of varying degrees of opinion.

Future surveys regarding this topic could include RDs from across the US to confirm the responses received. By including a larger sample size, the data collected would be more representative of the RD's perception regarding physician nutrition knowledge and IPE.

CHAPTER VI

CONCLUSION

This study focuses on the nutrition knowledge possessed by physicians and the interprofessional communication currently taking place within the medical field. Through collecting voluntary survey responses from RDs within Texas, researchers, educators, and medical professionals can gain valuable insight into the current state of medicine and specifically nutrition. Unfortunately, most RDs do not believe medical doctors are adequately trained in nutrition on a variety of fronts. However, most RDs claim to have strong, working communications with physicians in team environments to promote successful patient outcomes. The lack of nutrition preparedness leads to a direct recommendation for increasing and requiring nutrition education within medical school curricula. Through including such material in the requirements for graduation, doctors may be better equipped to tackle nutrition-related problems and boost confidence in their abilities to practice.

CHAPTER VII

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CHAPTER VIII

APPENDIX A: IRB Document

INSTITUTIONAL REVIEW BOARD

STUDENT PROTOCOL REVIEW REQUEST

The TCU Institutional Review Board (IRB) is responsible for protecting the welfare and rights of the individuals who are participants of any research conducted by faculty, staff, or students at TCU. Approval by the IRB must be obtained prior to initiation of a project, whether conducted on-campus or off-campus. While student research is encouraged at both the undergraduate and graduate level, only TCU faculty or staff may serve as Principal Investigator and submit a protocol for review.

Please submit this protocol to the appropriate Departmental Review Board for recommendation and submission to the IRB. DRBs will submit to the IRB electronically at IRB.StudentSubmit (pdf preferred). Include the Protocol Approval Form as a word document with highlighted sections filled in. Also submit a consent document, HIPAA form if applicable, Protecting Human Research Participants Training certificates, recruitment materials, and any questionnaires or other documents to be utilized in data collection. A template for the consent document and HIPAA form, instructions on how to complete the consent, and a web link for the Protecting Human Research Participants Training are available on the TCU IRB webpage at www.research.tcu.edu. Submission deadline for protocols is the 15th of the month prior to the IRB Committee meeting.

1. Date: 11/11/2019

2. Study Title: Registered Dietitians' Recommendations for Nutrition Education and Interprofessional Education in Medical School Curriculum

3. Principal Investigator (must be a TCU faculty or staff): Jada L Willis (Stevenson), PhD, RDN, LD; Co-Pi: Rebecca Dority, MS, RD, LD, CDE and Gina Hill, PhD, RD, LD

4. Department: Nutritional Sciences

5. Other Investigators: List all faculty, staff, and students conducting the study including those not affiliated with TCU.

Eric Estrada - undergraduate student

Elena Hurd - undergraduate student

Olivia Spears - undergraduate student

6. Project Period: 1/15/2020-1/15/2021

7. If you have external funding for this project –

Funding Agency: N/A **Project #:** N/A **Date for Funding:** N/A

8. If you intend to seek/are seeking external funding for this project –
Funding Agency: N/A **Amount Requested From Funding Agency:** N/A
Due Date for Funding Proposal: N/A

9. Purpose: Describe the objectives and hypotheses of the study and what you expect to learn or demonstrate:

The purpose of this study is to determine Registered Dietitians' (RDs) perceptions of nutrition knowledge and interprofessional practice of physicians.

10. Background: Describe the theory or data supporting the objectives of the study and include a bibliography of key references as applicable.

Today the prevalence of diseases such as obesity and cardiovascular disease has reached an all-time high.¹ Since the early 2000s, the World Health Organization has listed many nutrition-based diseases in their top ten causes of death. Unfortunately, most doctors do not have a strong foundation in nutritional care.² As a result, doctors often rely heavily on prescription drugs to treat the symptoms rather than combatting the root causes of patients' diseases. In recent years, the steadily declining rate of cardiovascular mortality has reached a plateau. However, with the help of a stronger nutrition-based approach to treatment via an emphasis on nutrition education, doctors can foster a decline in nutrition-based diseases and promote healthier lifestyles amongst their patients.¹

Fifty-one percent of medical students report that they were not given adequate nutrition education in medical school.³ The lack of emphasis on nutrition in medical school curricula can be attributed to a shortage of qualified faculty, an absence of collaboration and coordination with nutrition professionals, and an inadequate inclusion of mandatory nutrition-related topics in medical school curriculum.⁴ Incorporating nutrition education into medical school programs across the nation may lead to improved healthcare outcomes for patients, increased physician confidence in nutrition-related issues, as well as increased advocacy for healthy lifestyles with a myriad of healthcare benefits.^{3,4}

Primary-care physicians are responsible for the ongoing treatment of patients and providing for their general health needs. Registered Dietitians bring value to an interprofessional team providing primary care to help improve patient outcomes for an array of medical conditions. Incorporating RDs into health care delivery systems increases the ability to meet the needs of the individual patient⁵

References

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5. Registered Dietitian Nutritionists Bring Value to Emerging Health Care Delivery Models. *J Acad Nutr Diet.* 2014;114(12). <https://doi.org/10.1016/j.jand.2014.08.025>. Accessed April 10, 2019.

11. Subject Population: Describe the characteristics of the participant population including the inclusion and exclusion criteria and the number of participants you plan to recruit:

This study will include RDs in the state of Texas. Inclusion criteria includes RDs currently credentialed with the Commission of Dietetic Registration over the age of 18 years. Approximately two hundred RDs will be recruited for this study.

12. Recruitment Procedure: Describe your recruitment strategies including how the potential participants will be approached and precautions that will be taken to minimize the possibility of undue influence or coercion. Include copies of the recruitment letters, leaflets, etc. in your submission.

The survey will be distributed through various channels to RDs in Texas. Research team members will contact former TCU students as well as Dietetic Internship Directors to distribute the survey to their preceptors, faculty, and former students. Regional presidents and dietetic alliance leaders will be contacted directly to distribute the survey via email. Social media platforms will also be utilized to distribute the survey link. SurveyMonkey settings were configured for this study to not collect IP addresses of respondents. Participant recruitment and enrollment will not include any of study investigators' current students and no flyers will be distributed to any of their classes in order to avoid undue pressure on the students to participate.

13. Consenting Procedure: Describe the consenting procedure, whether participation is completely voluntary, whether the participants can withdraw at any time without penalty, the procedures for withdrawing, and whether an incentive (describe it) will be offered for participation. If students are used as participants, indicate an alternative in lieu of participation if course credit is provided for participation. If a vulnerable population is recruited, describe the measures that will be taken to obtain surrogate consent (e.g., cognitively impaired participants) or assent from minors and permission from parents of minors.

Potential participants will be provided with a link to an online consent form that must be confirmed prior to completion of the survey. This consent prompt and survey are included as Appendix A on page 8.

Participants do not have to participate in this survey without penalty or loss of benefits to which they are otherwise entitled. If participants choose to withdraw from the study, they can close out the internet browser to leave the survey. Any participant data collected prior to a subject voluntarily withdrawing from the study will not be included in the study results. Dr. Jada Willis, Phone 817-257-7309, will answer any questions the participant has about the study. For questions about rights as a participant or about injuries caused by this research, contact the Texas Christian University Institutional Review Board for the Protection of Human Participants, Graduate Studies & University Programs, Texas Christian University, Fort Worth, Texas 76129. You can also call Dr.

Dru Riddle, Chair, TCU Institutional Review Board, (817) 257-6811, d.riddle@tcu.edu; or Dr. Floyd Wormley, Associate Provost of Research, research.tcu.edu

14. Study Procedures: Provide a chronological description of the procedures, tests, and interventions that will be implemented during the course of the study. Indicate the number of visits, length of each visit, and the time it would take to undergo the various tests, procedures, and interventions. If blood or tissue is to be collected, indicate exactly how much in simple terms. Flow diagrams may be used to clarify complex projects.

RDs in Texas will be asked to participate in this study and complete an online survey (see pages 9-14). Research team members will send potential participants a Surve Monkey link via email where they will sign the consent document electronically. Participants will then complete the survey which consists of 27 questions and lasts ~10min (see pages 8-10).

15. Data Analyses: Describe how you will analyze your data to answer the study question.

The IBM SPSS version 24 statistical package will be used for all data analysis (SPSS Inc., Armonk, NY). Descriptive statistics including mean, range, and standard deviation will be calculated for all variables. All values will be expressed as mean±standard error of the mean (SEM) unless otherwise indicated. Frequency and percentages will be computed to describe the characteristics of the sample. The survey will be completed and results recorded through SurveyMonkey. This data will also be cross-tabulated with demographic data collected in the first part of the survey to determine if relationships exist between demographic variables and the survey categories. Statistical significance is set at $p < 0.05$.

16. Potential Risks and Precautions to Reduce Risk: Indicate any physical, psychological, social, or privacy risk which the subject may incur. Risk(s) must be specified. Also describe what measures have been or will be taken to prevent and minimize each of the risks identified. If any deception is to be used, describe it in detail and the plans for debriefing.

Risks associated with participation in this study are minimal. Participants may be uncomfortable providing information from their experiences about nutrition education in medical school curriculum. The participant has the ability to withdraw participation from this study, without penalty, at any point in time.

17. Procedures to Maintain Confidentiality: Describe how the data will be collected, de-identified, stored, used, and disposed to protect confidentiality. If protected health information is to be re-identified at a later date, describe the procedure for doing so. All signed consents and hard data must be stored for a minimum of 3 years in a locked filing cabinet (and locked room) in the principal investigator's office, lab, or storage closet at TCU. Your professional society may recommend keeping the materials for a longer period of time.

Anonymous surveys will be used, so researchers will not collect any information that can link a survey back to the participant. If any of the findings from this study are published, your name will not be used. All consent forms and data will be stored for three (3) years in a locked filing cabinet and destroyed thereafter.

18. Potential Benefits: Describe the potential benefits of the research to the participants, to others with similar problems, and to society.

There are no particular benefits to the participants. However, this study extends a line of research on medical school learning of theoretical significance and also has strong applied implications, as it directly suggests how medical school curricula can be improved by incorporating nutrition education. The resulting knowledge may be used by faculty at medical schools to further educate their students about nutritional sciences.

19. Training for Protecting Human Research Participants: Submit training certificates for all the study investigators. The training link is available on the TCU IRB webpage at www.research.tcu.edu.

Training for Protecting Human Research Participants



Completion Date 11-Apr-2019
Expiration Date 10-Apr-2023
Record ID 31267245

This is to certify that:

Olivia Spears

Has completed the following CITI Program course:

Human Subjects Research (Curriculum Group)
Human Subjects Researcher (social-behavioral-educational) (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Texas Christian University



Verify at www.citiprogram.org/verify/?wc9db8797-da8b-47e0-86c0-6a8afa3f631d-31267245



Completion Date 11-Apr-2019
Expiration Date 10-Apr-2023
Record ID 31267246

This is to certify that:

Olivia Spears

Has completed the following CITI Program course:

Public Health Research (Curriculum Group)
Public Health Researcher (Course Learner Group)
1 - Basic (Stage)

Under requirements set by:

Texas Christian University



Verify at www.citiprogram.org/verify/?wacb8fda1-f094-447e-8576-ecf9f4bf581a-31267246



Completion Date 10-Apr-2019
 Expiration Date 09-Apr-2023
 Record ID 31249690

This is to certify that:

Elena Hurd

Has completed the following CITI Program course:

Human Subjects Research (Curriculum Group)
Human Subjects Researcher (social-behavioral-educational) (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Texas Christian University



Verify at www.citiprogram.org/verify/?w5f761849-6f94-4c78-adbb-1f2e3121e390-31249690



Completion Date 10-Apr-2019
 Expiration Date N/A
 Record ID 31249689

This is to certify that:

Elena Hurd

Has completed the following CITI Program course:

Information Privacy Security (IPS) (Curriculum Group)
Students and Instructors (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Texas Christian University



Verify at www.citiprogram.org/verify/?w485a6fdf-b9b7-4d12-83a6-b2a7ae269112-31249689



Completion Date 09-Apr-2019
 Expiration Date 08-Apr-2023
 Record ID 31257064

This is to certify that:

Eric Estrada

Has completed the following CITI Program course:

Human Subjects Research (Curriculum Group)
Human Subjects Researcher (social-behavioral-educational) (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Texas Christian University



Verify at www.citiprogram.org/verify/?w7f76dc2d-32fb-499e-998a-0aa5a83ba730-31257064



Completion Date: 06-Mar-2019
Expiration Date: 05-Mar-2023
Record ID: 30430666

This is to certify that:

Jada Stevenson

Has completed the following CITI Program course:


Human Subjects Research (Curriculum Group)
Human Subjects Researcher (social-behavioral-educational) (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Texas Christian University



Verify at www.citiprogram.org/verify/?wea450286-c2f9-4aa6-b9c8-3e83db62a1d4-30430666



Completion Date: 17-Oct-2018
Expiration Date: 16-Oct-2022
Record ID: 29102604

This is to certify that:


Gina Hill

Has completed the following CITI Program course:


Human Subjects Research (Curriculum Group)
Human Subjects Researcher (social-behavioral-educational) (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Texas Christian University



Verify at www.citiprogram.org/verify/?w9911650a-b77c-4477-90e6-4fc3993dbef2-29102604



Completion Date: 14-Aug-2019
Expiration Date: 13-Aug-2023
Record ID: 31477036

This is to certify that:


Rebecca Dority

Has completed the following CITI Program course:

Human Subjects Research (Curriculum Group)
Human Subjects Researcher (social-behavioral-educational) (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Texas Christian University



Verify at www.citiprogram.org/verify/?w891b979f-6af9-4efc-a90d-9b99e2c478cb-31477036

20. Check List for the Items That Need to be Submitted: Please combine all the files into one pdf document before submitting the materials electronically to the IRB. To prevent any delay in the approval of your protocol, use the most recent template for the protocol, consent document, and HIPAA form by downloading them from www.research.tcu.edu each time you prepare your materials.

- a. Protocol
- b. Consent document
- c. HIPAA form if applicable

- d. Protecting Human Research Participants Training certificate for each investigator
- e. Recruitment fliers, letters, ads, etc.
- f. Surveys or other documents utilized in screening and data collection

Principal Investigator Assurance

1. By signing below, I certify to the following:

- The project described herein will be conducted in accordance with applicable TCU policies and procedures, as determined by the IRB of record. All Human Subject Research projects occurring at TCU must be conducted in compliance with the Office of Human Protection (“OHRP”) regulations at 45 CFR 46 and all other applicable federal and state laws and regulations (collectively “Applicable Law”)
- I have a working knowledge of Applicable Law
- All personnel who work with human participants under this protocol have received, or will receive, appropriate training in protocol procedures and protection of human subjects prior to working with humans.
- All experiments involving human participants will be performed only by the qualified individuals listed in this protocol and individuals not listed in this protocol will not participate in the protocol experiments.
- Procedures on experimental subjects described in this IRB protocol accurately reflect those described in the funding applications and awards, if externally supported.
- I and all personnel have read and will comply with any pertinent safety information, IRB requirements, and security procedures.
- I will maintain records of all human participants and the procedures carried out throughout the entire term of my project.
- As Principal Investigator, I am aware that I have the ultimate responsibility, on a day-to-day basis, for the proper care, treatment, and protection of the human participants.

Signature of Principal Investigator

Date

Recruitment Email Example and Social Media Post

Texas RDs Needed!

The TCU Department of Nutritional Sciences is recruiting Registered Dietitians to participate in a quick, 10 minute survey. The purpose of this study is to determine Registered Dietitians' (RDs) perceptions of nutrition knowledge and interprofessional practice of physicians. Please distribute this survey (insert survey link) to Registered Dietitians. Thank you for your participation.

APPENDIX B: Survey

Registered Dietitians' Perceptions of Nutrition Knowledge and Interprofessional Practice of Physicians

Thank you for your interest in this study. The purpose of this study is to determine Registered Dietitians' (RDs) recommendations for nutrition education in medical school curriculum. Additionally, this study seeks to examine and emphasize the role of interprofessional education in medical education. Please answer the following questions as truthfully as possible. The questions relate to your individual perceptions. The survey should take no longer than 10 minutes to complete. Survey Monkey settings were configured for this study to not collect IP addresses of respondents.

Anonymous surveys will be used, so researchers will not collect any information that can link a survey back to the participant. If any of the findings from this study are published, your name will not be used. All consent forms and data will be stored for three (3) years in a locked filing cabinet and destroyed thereafter.

There are no reasonably foreseeable risks or discomforts involved in taking part in this study. Upon completion of this research project, analysis of the resulting data will be in aggregate form. Individual answers will not be published.

If you have questions, concerns, or complaints, or think the research has hurt you, contact Mrs. Rebecca Dority, Dr. Gina Hill, or Dr. Jada Willis, Nutritional Sciences, via phone: 817-257-7309 or by email at r.dority@tcu.edu, g.jaman@tcu.edu or jada.willis@tcu.edu, respectively.

Additionally, if you have any concerns regarding your treatment as a participant in this study, please contact the TCU Institutional Review Board via phone at (817) 257-6436. Dr. Dru Riddle, Chair, TCU Institutional Review Board, (817) 257-6811, d.riddle@tcu.edu; or Dr. Floyd Wormley, Associate Provost of Research, floyd.wormley@tcu.edu. By clicking the advance button below, I agree to participate in the research study and that I am a RD/RDN 18 years of age or older. I understand the purpose and nature of this study and I am participating voluntarily. I understand that I can withdraw from the study at any time, without any penalty or consequences. I understand that my responses will be confidential. I grant permission for the data generated from this survey to be used in the researchers' publications on this topic.

* 1. By choosing "I agree" to the study consent below, I affirm that I am a RD/RDN 18 years of age or older. I understand the purpose and nature of this study and I am participating voluntarily. I understand that I can withdraw from the study at any time, without any penalty or consequences. I understand that my responses will be confidential. I grant permission for the data generated from this survey to be used in the researchers' publications on this topic.

I agree.

2. What is your gender?

Male

Female

Non-binary/Third gender

Prefer not to say

Prefer to describe (please specify)

3. What is your race/ethnicity?

- White or Caucasian
- Black or African American
- Hispanic or Latino
- Other (please specify)
- Asian or Asian American
- American Indian or Alaska Native
- Native Hawaiian or other Pacific Islander

4. How old are you?

5. How long have you been a Registered Dietitian (RD)/Registered Dietitian Nutritionist (RDN)?

6. How many years have you practiced or did you practice in the dietetics field with direct patient care?

7. What advanced practice certifications do you currently hold or have held in the past? Check all that apply.

- Board Certified Specialist in Gerontological Nutrition (CSG)
- Board Certified Specialist in Obesity and Weight Management (CSOWM)
- Board Certified Specialist in Oncology Nutrition (CSO)
- Board Certified Specialist in Pediatric Clinical Care Nutrition (CSPCC)
- Board Certified Specialist in Pediatric Nutrition (CSP)
- Board Certified Specialist in Renal Nutrition (CSR)
- Board Certified Specialist in Sports Dietetics (CSSD)
- Other (please specify)
- Certified Culinary Medicine Specialist (CCMS)
- Certified Diabetes Educator (CDE)/Certified Diabetes Care and Education Specialist (CDCES)
- Certified in Family and Consumer Sciences (CFCS)
- International Board Certified Lactation Consultants (IBCLC)
- Certified Nutrition Support Clinician (CNSC)
- Certified Eating Disorders Registered Dietitian (CEDRD)

8. In what area(s) do you currently practice? (Check all that apply.)

- | | |
|--|--|
| <input type="checkbox"/> Clinical nutrition - Acute care/inpatient | <input type="checkbox"/> Food and nutrition management |
| <input type="checkbox"/> Clinical nutrition- Ambulatory care | <input type="checkbox"/> Consultation and business |
| <input type="checkbox"/> Clinical nutrition- Long-term care | <input type="checkbox"/> Education and research |
| <input type="checkbox"/> Community | |
| <input type="checkbox"/> Other (please specify) | |

9. In what area(s) have you previously practiced? (Check all that apply.)

- | | |
|---|--|
| <input type="checkbox"/> Clinical nutrition- acute care/inpatient | <input type="checkbox"/> Food and nutrition management |
| <input type="checkbox"/> Clinical nutrition- ambulatory care | <input type="checkbox"/> Consultation and business |
| <input type="checkbox"/> Clinical nutrition- long-term care | <input type="checkbox"/> Education and research |
| <input type="checkbox"/> Community | |
| <input type="checkbox"/> Other (please specify) | |

10. In your current work setting, how often do you verbally communicate with physicians regarding patient care?

- | | |
|---|---|
| <input type="radio"/> Never | <input type="radio"/> Weekly |
| <input type="radio"/> About once a month | <input type="radio"/> Multiple times a week |
| <input type="radio"/> Several times a month | <input type="radio"/> Daily |

For each of the statements below, select the answer which corresponds to the performance of the physician(s) you generally work with:

11. In my opinion, physicians are well-prepared to educate their patients in nutrition.

- | | |
|--|---|
| <input type="radio"/> Strongly agree | <input type="radio"/> Disagree |
| <input type="radio"/> Agree | <input type="radio"/> Strongly disagree |
| <input type="radio"/> Neither agree nor disagree | <input type="radio"/> Not applicable |

12. I believe the physicians I am working with are capable of identifying appropriate diets for patients.

- | | |
|--|---|
| <input type="radio"/> Strongly agree | <input type="radio"/> Disagree |
| <input type="radio"/> Agree | <input type="radio"/> Strongly disagree |
| <input type="radio"/> Neither agree nor disagree | <input type="radio"/> Not applicable |

13. In my experience, physicians are knowledgeable on the interactions between dietary nutrients and prescribed medications.

- | | |
|--|---|
| <input type="radio"/> Strongly agree | <input type="radio"/> Disagree |
| <input type="radio"/> Agree | <input type="radio"/> Strongly disagree |
| <input type="radio"/> Neither agree nor disagree | <input type="radio"/> Not applicable |

14. In my experience, physicians are properly recommending and monitoring dietary supplements.

- | | |
|--|---|
| <input type="radio"/> Strongly agree | <input type="radio"/> Disagree |
| <input type="radio"/> Agree | <input type="radio"/> Strongly disagree |
| <input type="radio"/> Neither agree nor disagree | <input type="radio"/> Not applicable |

15. In my experience, physicians refer patients/clients to RDs when appropriate.

- | | |
|--|---|
| <input type="radio"/> Strongly agree | <input type="radio"/> Disagree |
| <input type="radio"/> Agree | <input type="radio"/> Strongly disagree |
| <input type="radio"/> Neither agree nor disagree | <input type="radio"/> Not applicable |

16. In my experience, physicians discuss nutrition with patients/clients when appropriate.

- | | |
|--|---|
| <input type="radio"/> Strongly agree | <input type="radio"/> Disagree |
| <input type="radio"/> Agree | <input type="radio"/> Strongly disagree |
| <input type="radio"/> Neither agree nor disagree | <input type="radio"/> Not applicable |

17. I am comfortable interacting with or providing nutrition information to physicians in a healthcare team setting.

- | | |
|--|---|
| <input type="radio"/> Strongly agree | <input type="radio"/> Disagree |
| <input type="radio"/> Agree | <input type="radio"/> Strongly disagree |
| <input type="radio"/> Neither agree nor disagree | <input type="radio"/> Not applicable |

For each of the statements below, select the answer which corresponds to the performance of the physician(s) you generally work with:

18. Establishes collaborative relationships with RDs/RDNs.

- | | |
|---|---|
| <input type="radio"/> Well below expected | <input type="radio"/> Above expected |
| <input type="radio"/> Below expected | <input type="radio"/> Well above expected |
| <input type="radio"/> Expected | <input type="radio"/> Not observable |

19. Integrates information and perspectives from others in planning and providing patient/client care.

- | | |
|---|---|
| <input type="radio"/> Well below expected | <input type="radio"/> Above expected |
| <input type="radio"/> Below expected | <input type="radio"/> Well above expected |
| <input type="radio"/> Expected | <input type="radio"/> Not observable |

20. Shares evidence-based or best practice discipline-specific knowledge with others.

- | | |
|---|---|
| <input type="radio"/> Well below expected | <input type="radio"/> Above expected |
| <input type="radio"/> Below expected | <input type="radio"/> Well above expected |
| <input type="radio"/> Expected | <input type="radio"/> Not observable |

21. Seeks input from patient/client and family.

- | | |
|---|---|
| <input type="radio"/> Well below expected | <input type="radio"/> Above expected |
| <input type="radio"/> Below expected | <input type="radio"/> Well above expected |
| <input type="radio"/> Expected | <input type="radio"/> Not observable |

22. Demonstrates recognition of the relationship between team functioning and quality of care.

- | | |
|---|---|
| <input type="radio"/> Well below expected | <input type="radio"/> Above expected |
| <input type="radio"/> Below expected | <input type="radio"/> Well above expected |
| <input type="radio"/> Expected | <input type="radio"/> Not observable |

23. Contributes to interprofessional team discussions.

- | | |
|---|---|
| <input type="radio"/> Well below expected | <input type="radio"/> Above expected |
| <input type="radio"/> Below expected | <input type="radio"/> Well above expected |
| <input type="radio"/> Expected | <input type="radio"/> Not observable |

24. Seeks the perspectives and opinions of RDs/RDNs.

- | | |
|---|---|
| <input type="radio"/> Well below expected | <input type="radio"/> Above expected |
| <input type="radio"/> Below expected | <input type="radio"/> Well above expected |
| <input type="radio"/> Expected | <input type="radio"/> Not observable |

25. In your opinion, what topics are physicians well-prepared regarding nutrition?

26. Pretend you are designing a nutrition course for medical school students. What three focus areas would be covered in your course?

27. In your own words, what do you want physicians to know about Registered Dietitians?

Thank you for participating in this survey.

APPENDIX C: IRB Exempt Approval of Protocol



**TCU Institutional Review Board
3101 Sadler Hall
Fort Worth, Texas 76129**

DATE: 9-June-2020

TO: Jada Willis
FROM: TCU Institutional Review Board
RE: Exempt Approval of Protocol 1920-233

Dear Jada:

In accordance with applicable federal law governing the use of human subjects in research, the TCU Institutional Review Board ("IRB") has reviewed your proposed project entitled "Registered Dietitians' Recommendations for nutrition Education and Interprofessional Education in Medical School Curriculum" and determined that your study is considered minimal risk, qualifying for an exemption from further IRB review under category 2. Specifically, 45 CFR 46.104(d)(2)(ii) identifies studies that are exempt from further IRB review, including: Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation.

The IRB has determined that your proposed uses survey procedures. Additionally, any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation. For these reasons, the IRB has determined that your proposed study is exempt from further IRB review.

Remember that even though your project is exempt from further IRB review, the research must be conducted according to the proposal submitted to the IRB. Minor changes to this study generally will not require IRB review. Substantive modifications, however, will need IRB review, since the review category might change as a result of modification. Some examples of substantive modifications include: change in PI, study purpose, procedures, funding source, study population, level of risk, or identifiability of collected data. If at any time you are unsure as to whether a change is minor or substantive, please submit a question to Research Compliance for assistance.



**TCU Institutional Review Board
3101 Sadler Hall
Fort Worth, Texas 76129**

If you wish to make substantive changes to the approved protocol, you must submit a [Request for Amendment/Modification to Protocol](#) form to the IRB. You may not implement any changes until you have received IRB approval of such changes. Also, please be aware that changes to the research protocol may prevent the research from qualifying for exempt review and require submission of a new IRB application or other materials to the IRB.

Please contact Research Compliance at research@tcu.edu or (817) 257-5070, if you need any additional information.

Sincerely,
Research Compliance on behalf of TCU Institutional Review Board