PRE-HEALTH STUDENTS' KNOWLEDGE AND PERCEPTION OF THE ROLE OF THE REGISTERED DIETITIAN IN HEALTHCARE

by

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ABSTRACT

Medical nutrition therapy (MNT) is evidence-based nutrition therapy provided by a Registered Dietitian/Registered Dietitian Nutritionist (RD/RDN) to help treat medical conditions. The purpose of the study was to evaluate the current understanding and perception of the RD/RDN role in healthcare among undergraduate pre-health students. Following IRB approval, a convenience sample of TCU pre-health students (n=94) completed an electronic survey. Data were coded into and analyzed using SPSS 29. 23% (n=22) of participants had previously taken a nutrition course. Participants were asked on their opinions regarding the importance of the RD/RDN in improving the quality of care for patients with a variety of diseases, including heart disease, diabetes, obesity, stroke, cancer, chronic kidney disease, Parkinson's disease, Crohn's disease, irritable bowel syndrome, eating disorders, and ulcerative colitis. 55% (n=52) of participants reported that the RD/RDN would be important in the care for all of these conditions. When asked if they would either refer a patient with a specific disease to an RD/RDN for nutrition counseling, provide a nutrition handout, briefly educate patient on nutrition themselves, or recommend online nutrition information from an official source, over half of participants would refer to an RD/RDN for obesity, celiac disease, heart disease, chronic kidney disease, diabetes, Crohn's disease, irritable bowel syndrome, eating disorders and ulcerative colitis. Fewer than half of participants would refer patients with Parkinson's disease, cancer and stroke to an RD/RDN. Less than a quarter of pre-health students have taken a nutrition course and therefore most are likely unfamiliar with MNT recommendations appropriate for various chronic diseases.

TABLE OF CONTENTS

ABSTRACT……..iii

I. INTRODUCTION 1

II. REVIEW OF LITERATURE……..3
Undergraduate Interprofessional Education/Stereotypes.....3
Professional School Nutrition Education.....4
Medical Nutrition Therapy…….....4
Dietitian Referral Rates…….....6

III. METHODS…….....7

IV. RESULTS……..……...……9

V. DISCUSSION & CONCLUSIONS…….……....……...17

REFERENCES…….…….....20

INTRODUCTION

The role of nutrition in the onset of chronic disease and patient outcomes has become increasingly recognized in the realm of healthcare.[1] This highlights the growing importance of ensuring that healthcare providers are sufficiently prepared to educate patients on relevant and beneficial nutrition interventions. However, the medical school curriculum currently lacks nutrition coursework and highlights the need for more interprofessional education. Importantly, this deficiency in applicable nutrition education for patient care is not limited to the training of future physicians but also draws relevance in establishing the nutrition-based competency of nurses, pharmacists, physician assistants, dentists, and exercise physiologists.[1]

Registered Dietitians/Registered Dietitian Nutritionists (RD/RDN), in particular, can play a significant complementary role in patient healthcare by providing focused nutrition care in the form of medical nutrition therapy (MNT).[2] MNT is regularly utilized for the treatment of patients suffering from a variety of diseases and conditions, including but not limited to Type 2 diabetes mellitus, heart disease, chronic kidney disease, gastrointestinal disorders, food allergies and intolerances, and cancer.[2] As outlined in the Scope and Standards of Practice for RDs/RDNs, MNT also involves RD/RDN collaboration with other health professionals as members of an interprofessional team in order to coordinate patient care.[2] However, the role of the RD/RDN as part of a standard patient healthcare team has yet to be strongly established and consistently recognized.

Generally, medical students, residents, and practicing physicians possess little knowledge and training in nutrition, a fact that can often act as a barrier to providing the best patient care.[3] This comes from a lack of nutrition education during medical school, a problem that has persisted for decades despite attempts by the American Medical Association to increase its inclusion in

medical school curriculums as noted by the Academy of Nutrition and Dietetics.[3] Another important barrier revolves around the low frequency of RD/RDN referrals relative to the many patients who could benefit from RD/RDN services.[4] This highlights the need to direct more attention towards encouraging practicing physicians to make regular RD/RDN referrals.[4]

Increased collaboration between members of the primary care team and RD/RDNs can have significant benefits for patient health outcomes.[5] As the healthcare world continues to recognize the critical role of dietary and lifestyle interventions for disease prevention and treatment, improving the understanding of and perceived value for the role of the RD/RDN will contribute to advancing patient care to the highest potential. This also highlights the need for increased interprofessional education starting at the undergraduate level.

The study's objective was to evaluate the current understanding and perception of the RD/RDN role in healthcare among the TCU undergraduate pre-health population. We hypothesized that most pre-health undergraduate students at TCU have little information on and understanding of the RD/RDN role and education requirements.

LITERATURE REVIEW

Undergraduate Interprofessional Education/ Stereotypes

Interprofessional education (IPE) is an approach to educate two or more professionals together to obtain a common goal.[6] Understanding the health care team members' roles and responsibilities, skills, and values increases interprofessional collaboration, which ultimately increases patient effectiveness. When students from different health disciplines learn together, they will be better equipped to work together.

An article published in 2021 determined 100 undergraduate pre-health students' perceptions of various health disciplines. This study examined pre-health students' perceptions of stereotypes using the Student Stereotypes Ratings Questionnaire (SSRQ). The mean scores were calculated based on various traits. The participants completed the survey at the beginning and the end of a six-week summer enrichment course that focused primarily on IPE. At the beginning of the program, the lowest score was the registered dietitian's ability to lead a team.[7] After learning about the different roles and responsibilities of all the disciplines, the perception of health professions was positively affected. This study indicates that there are benefits to exposing pre-health students to IPE to reduce stereotypes and increase awareness of the roles of different health disciplines.

IPE also focuses on interprofessionalism, which is incorporating teamwork and professionalism into health care.[8] A study focused on over 2,000 students from different departments including nursing, nutrition, social work, and pre-professional health programs. The students from these disciplines were split into different groups and were given opportunities to work through ethical decision making together during an IPE class. At the end of the class, students

not only learned about the values and ethics of each discipline, but they also learned the complexity and diversity involved in creating high-quality healthcare for patients.[8] This IPE class taught the students to have a mutual respect for other health care disciplines and helped identify values that they share amongst health care. Improving collaboration amongst health care workers increases the effectiveness of patient-centered care.

Professional School Nutrition Education

An online survey from 2018 asked physicians to describe their nutrition education and knowledge of the role and responsibilities of a registered dietitian. In the United States, 58% of physicians recall receiving no form of nutrition education in medical school.[9] Of those physicians that had received some form of nutrition education, most had learned from one lecture or a section of a single lecture. When counseling patients regarding nutrition, 57% of physicians engaged in direct discussion.[9] The discussion primarily centered around reducing fried foods and limiting sugar and sodium intake. While physicians engaged in nutrition counseling, 64% of physicians referred to a dietitian and 35% provided education handouts.[9] Educational handouts consisted of a sheet of paper or pamphlet discussing limited details regarding the chronic disease or illness and related nutrition aspects. Physicians lack the knowledge to provide nutrition counseling due to insufficient education in medical school.

Medical Nutrition Therapy

The Commission on Dietetic Registration (CDR) summarizes MNT as an evidence-based application of the Nutrition Care Process that typically results in the prevention, delay or management of diseases and/or conditions in the 2023 Definition of Terms.[10] The Nutrition Care

Process typically encompasses nutrition assessment and reassessment, nutrition diagnosis, nutrition intervention, and nutrition monitoring and evaluation.[10] MNT services are offered by Registered Dietitians/Registered Dietitian Nutritionists, allowing for highly individualized nutrition interventions that can be created for patients suffering from a wide range of diseases and conditions. Currently, MNT services covered by Medicare Part B only include patients with diabetes or kidney disease. [11]

MNT has been found to significantly improve the management of or outcomes for patients with various chronic diseases and conditions including cancer,[12,13] diabetes,[14] dyslipidemia,[15] kidney disease,[16] obesity,[17] and stroke.[18] Nutrition counseling for head and neck cancer patients in particular has been especially significant due to side effects from cancer treatment (chemoradiotherapy or radiotherapy) that impact their ability to adequately intake nutrients and subsequently causes nutrient deficiencies.[12] Furthermore, in most patients with cachexia, nutrition therapy is a vital means to recover strength, calories, and nutrients in wake of active bodily wasting.[13]

MNT provided by dietitians is not only helpful in the prevention of Type 2 diabetes, for which obesity is a significant risk factor, but is also significant in the management of diabetes.[14] Eleven studies reported that MNT resulted in reductions in the dosing or number of glucose-lowering medications used by patients with diabetes.[14] For patients with dyslipidemia, multiple MNT visits with a RD/RDN was associated with a decrease in medication costs and improved quality of life years as measured in quality-adjusted life years (QALY).[19] These benefits were further accompanied by the improvement of health risk factors including weight status, blood pressure, and Hemoglobin A1C. However, MNT for dyslipidemia remains ineligible for reimbursement under Medicare.

Dietitian Referral Rates

Another significant issue relevant to the study topic is the low referral rate to dietitians that occurs in current medical practice. A study which included 45 participating hospitals and 8,405 admitted adult patient participants assessed the rate of dietitian referrals. Among these patients, there was a dietitian referral rate of only 16.8%.[20] Of 16,713 patients with prediabetes, 57% received a diagnostic code for prediabetes and 20.4% received some form of treatment. In total, only 11.3% of patients received an MNT referral. After 1 year of follow-up, 5.7% were referred to MNT.[21]

In a study assessing 348 chronic kidney disease (CKD) patients, 48% of participants had never met with an RD/RDN and nearly half reported that medical providers had never suggested they should see an RD/RDN.[22] This is further significant in light of the fact that many participants also indicated that they believed MNT would be useful for the management of CKD and were interested in receiving MNT services. The study additionally noted that an important barrier to RD/RDN referrals resulted from the many physicians and patients who were unaware that MNT services for kidney disease were covered by Medicare Part B and would therefore not represent an additional financial burden to the patient.

METHODS

Study Design

An online survey was conducted during a two-week period in which all TCU pre-health undergraduate students could participate. Surveys were completed on students' own mobile or electronic devices. The survey assessed pre-health students' knowledge and perception of the RD/RDN in healthcare through multiple question formats, including multi-answer selections and true or false. The TCU Institutional Review Board approved the study protocol and all participants provided written informed consent. Prior to IRB approval, an application was submitted to the TCU College of Science and Engineering for a Science and Engineering Research Center (SERC) grant. The grant was received, and the amount ($800) was used to purchase 40 $20 Amazon gift cards to act as an incentive for recruiting potential study participants. Participants who provided their names and contact information were included in a random drawing to win a gift card.

Participants

Participants were recruited through multiple methods. The inclusion criteria mandated that students be TCU pre-health students at least 18 years of age. One major strategy for recruitment was to target pre-health students enrolled in the Pre-Health Professional Development course. This course is geared towards juniors and seniors who are applying to professional school in the following application cycle. Students in this class were directly informed about the study by the course instructor and encouraged to participate. Mass emails containing the digital flyer and/or survey link were also sent to students via the Pre-Health student email list, and flyers were posted in TCU science buildings and library that provided QR codes linked to the survey. There were 109

participants in the study, but 15 were removed from consideration due to significant incompletion of the survey. A total of 94 respondent surveys were analyzed.

Survey Questions

The survey was created in accordance with the study's main objective to assess TCU pre-health student knowledge and perception of the role of the RD/RDN in health care. Questions included assessment of participants' demographics, previous history with a RD/RDN, previous enrollment in a nutrition course, questions pertaining to chronic diseases often associated with the use of MNT, and questions regarding educational requirements of RDs/RDNs.

Statistical Analyses

SPSS Version 29 was used to analyze data. Frequencies and means were calculated.

RESULTS

Demographics

There were 109 students who participated in the survey, but 15 responses were removed from consideration due to a lack of input provided in the survey. Among the remaining 94 participants, the mean age was 20.5 +/- 2.13 years and 84% (n=79) were female. Most participants were White (78%, n=73) and Non-Hispanic or Latino (81%, n=76). The percent of respondents who were Black/African American, Asian/Asian American, American Indian/Alaskan Native, Native Hawaiian/Pacific Islander were 6%, 10%, 1%, and 1% respectively.

Participant Characteristics

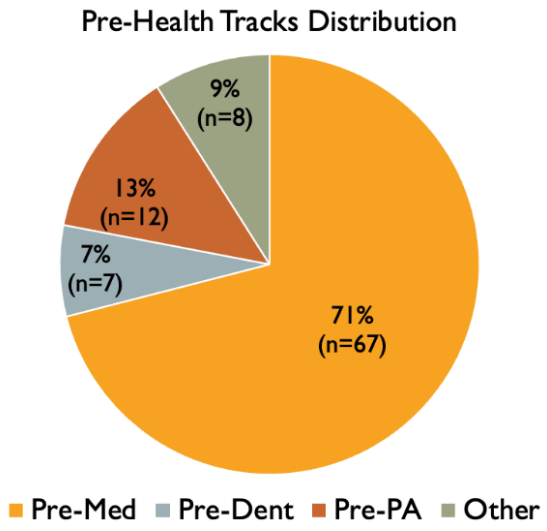

Figure 1

The most represented pre-health tracks were pre-medical, pre-physician's assistant, and pre-dental. Over two-thirds of respondents (71%, n=67) were on the pre-medical track (Figure 1). Multiple other pre-health tracks, including pre-veterinary, pre-optometry, pre-pharmacy, pre-physical

therapy, and pre-doctor of nurse anesthesia practice, were merged to represent 9% (n=8) of participants.

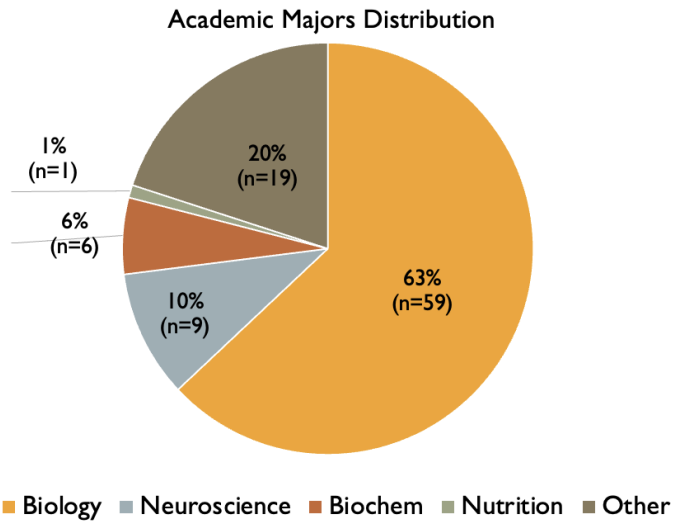

Figure 2

The most represented academic majors were biology, neuroscience, and biochemistry. Biology students represented the most common major of participants at 63% (n=59), (Figure 2). One nutrition major participated in this study. Multiple other majors, including chemistry, mathematics, movement science, higher education, psychology, and sociology, were merged to represent 20% (n=19) of participants.

Pre-Health Students: Meeting RD/RDN, Nutrition Course

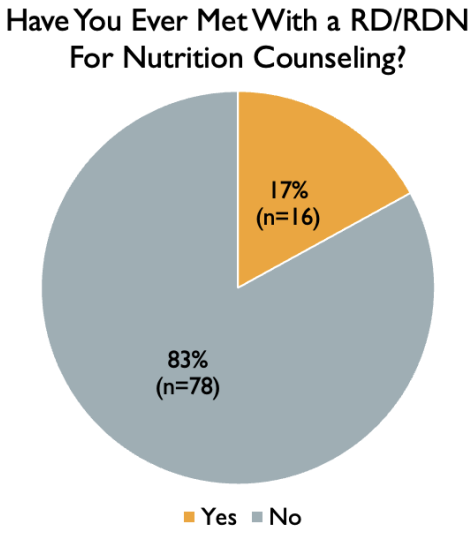

Figure 3

Eighty-three percent (n=78) of students had never met with a RD/RDN for nutrition counseling and 17% (n=16) had met with a RD/RDN for nutrition counseling (Figure 3).

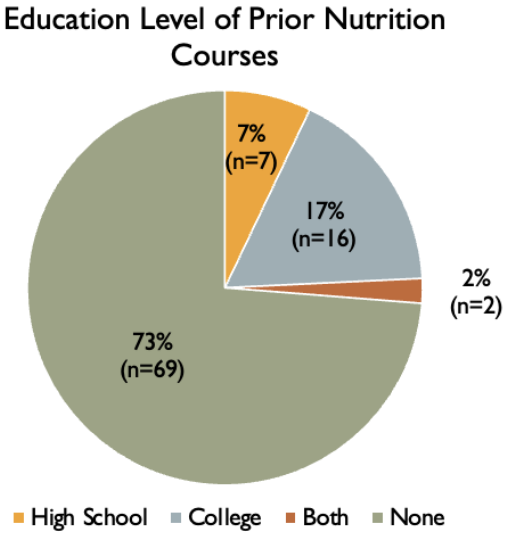

Figure 4

Participants' nutrition education background was assessed and 73% (n=69) of participants had never taken a nutrition class before. Twenty-seven percent (n=23) of participants had taken a nutrition class in either high school or college. As shown in Figure 4, just 2% (n=2) of participants had taken a nutrition course in high school and college.

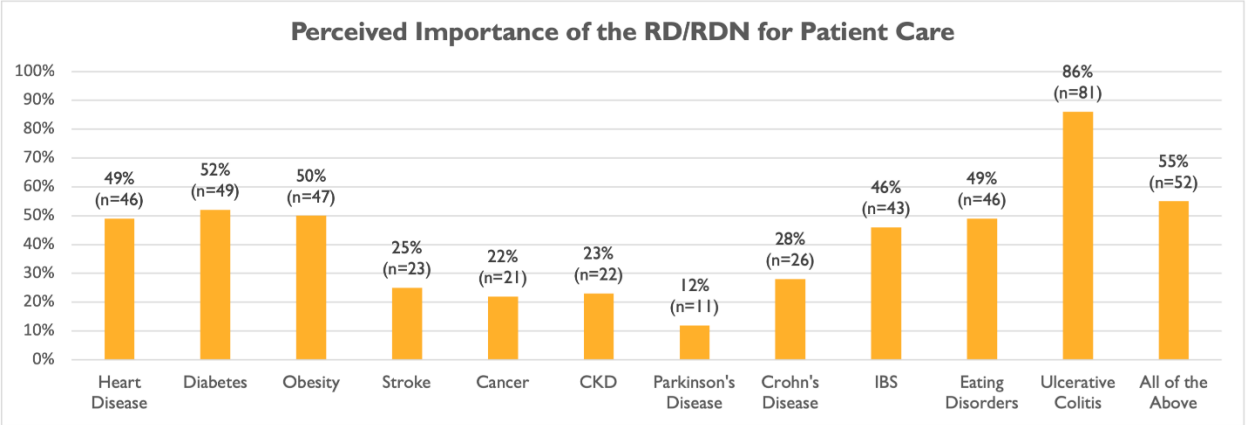

Figure 5

As shown in Figure 5, 55% of participants reported that the RD/RDN would be important in the care of all of the above chronic diseases. Ulcerative colitis was the most selected disease at 86% (n=81) while Parkinson's disease was selected the least at 12% (n=11).

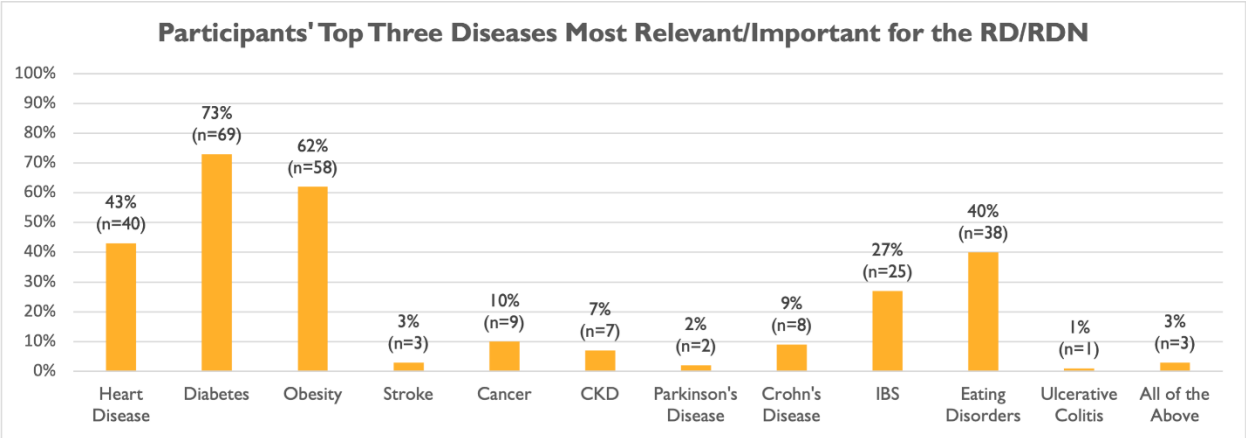

Figure 6

Participants were asked to identify the top three diseases they believed were most relevant or important for an RD/RDN out of the ones selected as answers to the previous question regarding perceived importance of the RD/RDN for patient care. The top three choices selected by participants were heart disease, diabetes, and obesity, as indicated in Figure 6.

Participants' Chosen Methods of Nutrition Intervention

Disease/ Condition	Refer to RD/RDN	Printed Handout	Self-educate Patient	Recommend Link to Official Source
Obesity	66% (n=62)	4% (n=4)	10% (n=9)	12% (n=11)
Parkinson's Disease	33% (n=31)	13% (n=12)	17% (n=16)	28% (n=26)
Celiac Disease	64% (n=60)	9% (n=8)	4% (n=4)	14% (n=13)
Heart Disease	55% (n=52)	12% (n=11)	5% (n=5)	17% (n=16)
Cancer	48% (n=45)	13% (n=12)	11% (n=10)	18% (n=17)
Chronic Kidney Disease	53% (n=50)	13% (n=12)	11% (n=10)	15% (n=14)
Diabetes	77% (n=72)	5% (n=5)	3% (n=3)	6% (n=6)
Stroke	35% (n=33)	16% (n=15)	20% (n=19)	20% (n=20)
Crohn's Disease	64% (n=60)	9% (n=8)	4% (n=4)	13% (n=12)
IBS	69% (n=65)	10% (n=9)	4% (n=4)	9% (n=8)
Eating Disorders	85% (n=80)	1% (n=1)	3% (n=3)	2% (n=2)
Ulcerative Colitis	60% (n=56)	12% (n=11)	3% (n=3)	17% (n=16)

Table 1

Participants were also asked to choose between four methods of nutrition intervention for patients with each of the listed chronic diseases and conditions. The methods included referring to an RD/RDN, providing a printed nutrition handout, conducting a brief self-directed nutrition education, or recommending a link to an official nutrition source (Table 1). For all listed diseases and conditions, the majority of participants chose the option to refer patients to an RD/RDN out of the selectable forms of nutrition intervention.

Pre-Health Students' Perception of Requirements to be an RD/RDN

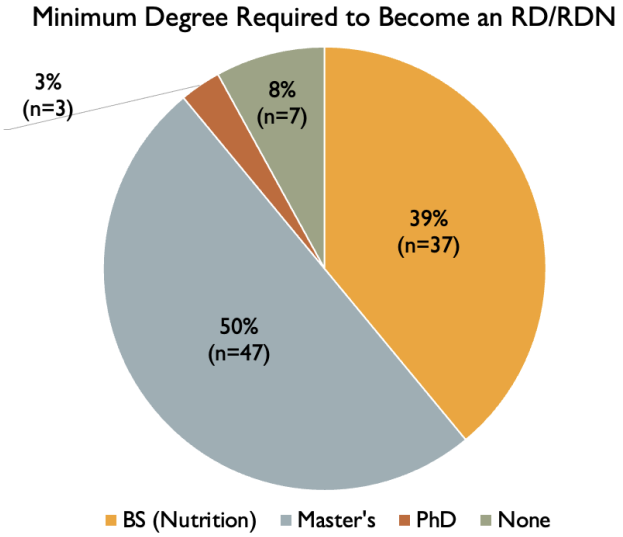

Figure 7

As shown in Figure 7, half of participants believe that the minimum degree required to become an RD/RDN is a master's degree. Thirty-nine percent (n=37) of students responded that a Bachelor of Science in nutrition is required. Eight percent (n=7) of participants stated that no minimum degree is required to become an RD/RDN.

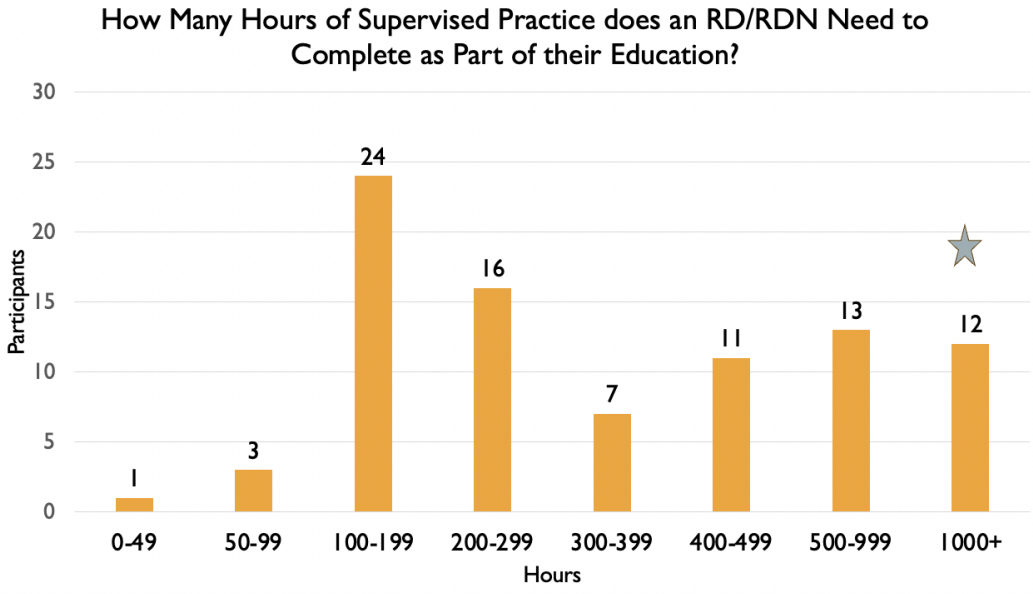

Figure 8

Per Figure 8, the most selected choice (n=24) by participants was that an RD/RDN must complete 100-199 hours of supervised practice in order to become an RD/RDN. The asterisk above the bar indicates that 1000+ hours of supervised practice is required to become an RD/RDN.

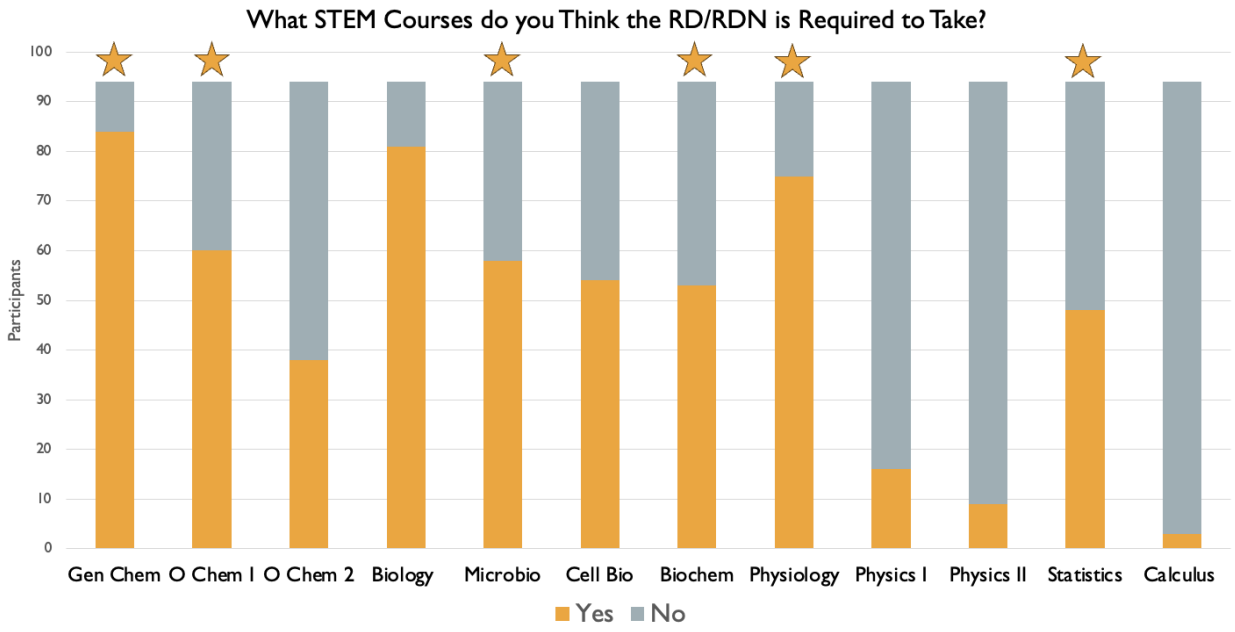

Figure 9

Students believe that RD/RDNs are required to take certain classes; 90% (n=84) general chemistry, 64% (n=60) organic chemistry I, 40% (n=38) organic chemistry II, 86% (n=81) biology, 62% (n=58) microbiology, 57% (n=54) cell biology, 56% (n=53) biochemistry, 80% (n=75) physiology, 17% (n=16) physics I, 10% (n=9) physics II, 51% (n=48) elementary statistics, 3% (n=3) calculus as represented in Figure 9. The asterisks above the bars indicate the STEM classes that RD/RDNs are required to take. These required classes include general chemistry, organic chemistry I, microbiology, biochemistry, physiology, and statistics.

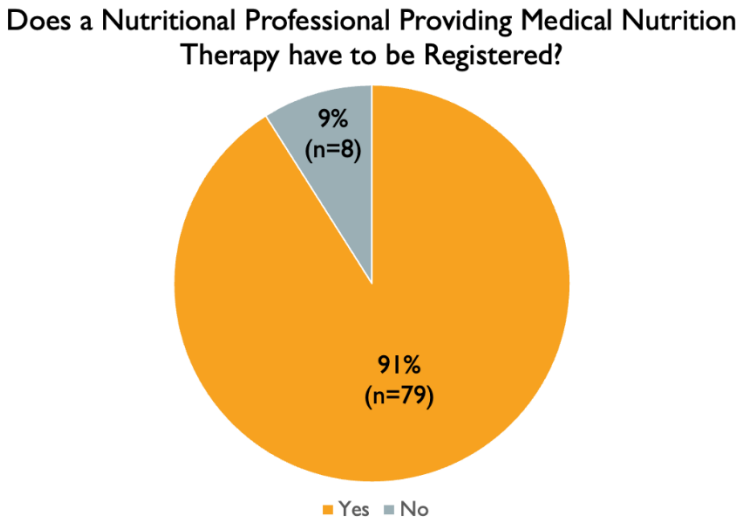

Figure 10

Per Figure 10, most participants (91%) believe that a nutritional professional (RD/RDN) providing MNT is required to be registered.

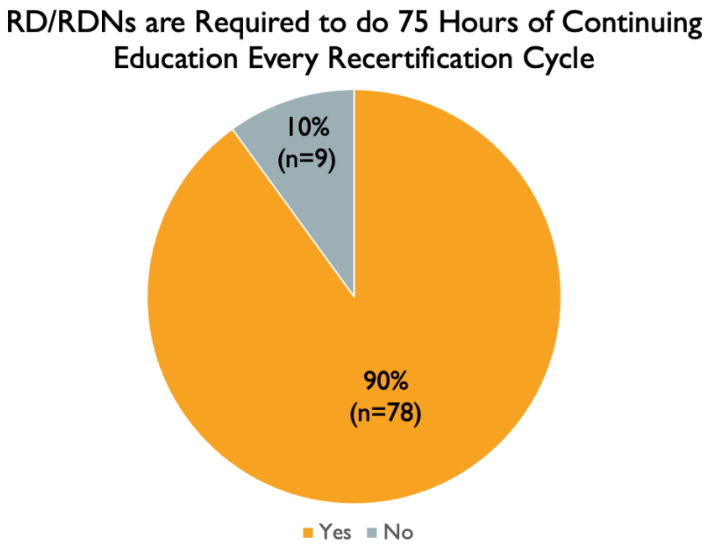

Figure 11

The majority (90%) of participants believe that RD/RDNs are required to complete 75 hours of continuing education (Figure 11).

DISCUSSION & CONCLUSIONS

Pre-health students are unsure about the education requirements to become an RD/RDN. Less than 60% of all participants were aware that RD/RDNs were required to take organic chemistry I, microbiology, biochemistry, and statistics. Thirteen percent (n=12) of participants stated that at least 1000 of supervised practice is required as part of RD/RDNs education. The majority of participants (n=24) stated that 100-199 hours are required. Most medical and dental schools recommend 100 hours of clinical experience prior to applying so pre-health students may have been comparing RD/RDN education to their own respective fields. Half of participants stated that a Master's degree is the minimum degree required to become an RD/RDN. As of January 2024, a Master's degree is required in order to take Registration Examination for RDNs. A Bachelor of Science in nutrition was required prior to January 2024. Eight percent (n=7) of students thought that there was no minimum degree required to become an RD/RDN. TCU pre-health students do not learn about what is required to become an RD/RDN as part of the coursework, unless they are nutrition majors. There is no IPE integrated into the curriculum, so students are not able to learn about the roles and responsibilities and education requirements of an RD/RDN.

Approximately 55% (n=52) of participants believed that patients with any of the diseases and conditions specified in the study could benefit from the expertise of an RD/RDN in their treatment. When participants were asked to choose a nutrition intervention for patients with these diseases/conditions, more than 50% of participants chose to refer to an RD/RDN for celiac disease, chronic kidney disease, Crohn’s disease, diabetes, eating disorders, heart disease, irritable bowel syndrome, obesity and ulcerative colitis. This indicated a significant gap in the number of pre-health students who perceived the importance or necessity of referring patients with these

disease/conditions and the potential number of patients who could benefit from MNT services provided by an RD/RDN.

Less than a quarter (23%, n=23) of TCU pre-health students had ever taken a nutrition course. This indicates that many participants were likely to possess a knowledge deficit regarding nutrition and specifically nutrition's critical role in the prevention and management of chronic disease. Furthermore, the different nutrition courses taken by students varied significantly in their relevance to the discussion of nutrition in the context of medical nutrition therapy. Additionally, 83% (n=78) of students had never met with an RD/RDN for nutrition counseling. Pre-health students are likely unknowledgeable of the role and responsibilities of an RD/RDN if they have never interacted with a nutrition professional or taken a nutrition class before.

Of the three diseases chosen most frequently as participants' top three diseases deemed most relevant or important to an RD/RDN, obesity and diabetes were two of the three selected. Notably, obesity and diabetes receive heavy media coverage regarding their connection to diet in mainstream society (such as the touted "obesity epidemic"), making it more likely for these participants to already have a preconceived stance regarding the relative importance of these two chronic diseases.

When participants were asked to choose between different referral methods for nutrition intervention, the most frequently chosen nutrition intervention following referral to an RD/RDN was recommendation of a link to an official nutrition information source (FDA, Academy of Nutrition and Dietetics). This could be due to multiple considerations, such as respondents' belief that the allotted time between physician and patient during visits is very restricted, a lack of personal nutrition knowledge, or low confidence in respondents' own ability as future healthcare providers to provide effective nutrition education.

Although participants' choices identified Parkinson's disease to be both the disease that would benefit the least from an RD/RDN involvement in patient care and the disease least necessitating a referral to an RDN, there are established nutrition protocols in place for RD/RDNs to use in MNT for Parkinson's patients. These protocols address the prevalent issue of malnutrition, often manifesting as inadequate nutrition intake, the need for a protein redistribution diet, and further GI considerations in Parkinson's patients.[23]

In conclusion, pre-health undergraduate students at TCU lack an established background in nutrition education, exposure to RD/RDNs, and knowledge of the RD/RDN role in treating patients with common chronic diseases and conditions. IPE would be a beneficial solution to bridge the knowledge gap between pre-health students and the roles, responsibilities, and education requirements of an RD/RDN. More research needs to be done to assess extraneous factors that may have contributed to the study outcomes.

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