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The overall purpose of this research was to assess the perceptions about nutrition education and the role of dietitians at a medical school in the Czech Republic. This work represents an international collaboration between The University of North Carolina at Greensboro and Masaryk University.

The adage, “you are what you eat” remains relevant today as our food choices are the foundation of a healthy lifestyle. Globally the increasing rates of non-communicable diseases (NCDs), the so called “lifestyle diseases” that include obesity, diabetes, and cardiovascular diseases, have potentially devastating complications including poor health outcomes. There is abundant evidence to support the role of nutrition in the prevention, management, and treatment of many health conditions including NCDs. Yet global research over the past decades has identified that many medical schools around the world lack adequate nutrition education for medical students. But with medical schools in the Czech Republic not represented in the published literature, the situation here is not clear.

This work included a qualitative assessment of students and faculty at Masaryk University medical school in Brno, Czech Republic. Using a thematic interview guide, semi-structured interviews were conducted with students ($n=30$) in both the Czech and English programs at the medical school, and faculty members ($n=6$) that taught in one or both programs. Interviews were conducted in either the Czech or English language. After transcription, the Czech interviews were translated into English, and then all interview

transcripts were prepared for review and thematic analysis. The themes identified revealed support for the important role of nutrition in medical care, concern about the limited amount of nutrition education offered at the medical school, a limited awareness about the role of dietitians in medical care, and student interest in additional education to improve nutrition knowledge and training to support the self-care and wellness of medical students.

This work supports the existing literature on this topic and identified concerns that medical students at Masaryk University medical school are not receiving adequate nutrition education to prepare them to provide nutrition care for patients. In addition, the results suggest that with limited awareness about the role of dietitians in medical care, there may be poor interdisciplinary collaboration and dietitians may be underutilized resulting in inadequate nutrition care for patients in the Czech Republic.

These findings support future work to highlight the role of nutrition in medical care and support the role of dietitians as the nutrition professionals in the Czech health system. Such work may include assessing the feasibility of dietitians offering nutrition education sessions on current topics to medical students at Masaryk University. In addition, as interdisciplinary collaboration is beneficial for patient care, it may be valuable for future research to assess the nutrition knowledge and perceptions about nutrition education for other allied health professionals educated at Masaryk University including nurses, pharmacists, and physical therapists.

PERCEPTIONS OF NUTRITION EDUCATION AND THE ROLE OF DIETITIANS
AT A MEDICAL SCHOOL IN THE CZECH REPUBLIC: AN
INTERNATIONAL COLLABORATION

by

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Dr. Lauren Haldeman
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*To Delite Hawk, an exceptional mother,
dietitian, and my first nutrition educator.*

Thanks for the nudge!

APPROVAL PAGE

This dissertation, written by Victoria Hazelette Hawk, has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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CHAPTER I

INTRODUCTION

Nutrition impacts everyone from birth through death playing a vital role in the prevention, treatment and management of disease that contributes to poor health outcomes around the world.¹ Over the past century essential nutrient deficiencies have decreased and rates of infectious diseases have dropped, but the rates of chronic diseases have risen likely due to changes in lifestyle behaviors including dietary choices.^{2,3} The World Health Organization (WHO) estimated that 70% of deaths world-wide are related to chronic disease with modifiable risk factors including an unhealthy diet.⁴ Evidence-based research supports the benefits of nutrition therapy which includes assessment and education for numerous health outcomes^{2,5} including reducing length of hospital stays due to malnutrition,⁶ improving blood pressure to reduce risk of mortality,⁷ promoting weight loss to reduce obesity,⁸ and the prevention of diabetes⁹ and cardiovascular disease.¹⁰ Physicians provide medical care and patients see them as a trusted source of health information,¹¹⁻¹⁴ yet many physicians feel unable to adequately counsel patients about common nutritional treatment options.¹⁵⁻¹⁷ Therefore, considering the efficacy of nutrition therapy for improving health outcomes,^{2,5,18,19} it is essential that medical schools offer students adequate education and training in nutrition to prepare them to identify nutrition-related issues, educate and counsel patients, and offer sufficient information to future doctors about the role of trained nutrition professionals and dietitians, to promote consultation and patient referrals when indicated. Dietitians are health professionals that

have completed specialized education and supervised clinical practice in nutrition and dietetics and are qualified to provide evidence-based care for nutrition related conditions.^{18,20} Unfortunately despite abundant evidence demonstrating the beneficial role of nutrition and dietetic interventions in the prevention, treatment and management of many health conditions,^{2,18,20,21} research identifies that many medical schools in Europe and around the world lack the recommended amounts of nutrition education for medical students²²⁻²⁴ which likely contributes to physicians reporting a lack of knowledge and time to provide patients with nutrition advice.^{15,17,25} Until recently the Czech Republic (CR) was not represented in any research on this topic, but a 2019 assessment of the online curriculum at Masaryk University (MU) medical school estimates that students are getting fewer hours of nutrition education than is recommended, 19.5 vs 25 hours.²⁶ With rising rates of obesity and nutrition related chronic diseases²⁷ along with more than half of the elderly population at risk of malnutrition,²⁸ this represents a growing concern for the health of the population of the Czech Republic.

Overview of the Czech Republic

The Czech Republic is a developed country located in central Europe and is a member of the European Union. After the end of Communism with the fall of the Berlin Wall in 1989, also known as the Velvet Revolution, CR formed a parliamentary democracy. This government promoted economic reforms, privatized industry, and returned business and land to private ownership²⁹ and after the split from Slovakia, dissolving the former Czechoslovakia, CR now abides by a constitution ratified in 1993.

In comparison to the United States, CR has a land mass approximately the size of South Carolina. The population of CR is over 10.7 million and ranked as the 86th most populous country in the world.³⁰ The life expectancy at birth cited by WHO is comparable to the US including for men and women (Cz 76/81y vs US 76/80y)^{31,32} but remains below the EU average.³³ Consistent with other developed countries the leading causes of death in the CR in 2019 were ischemic heart disease and stroke (CVD).³⁴ Both conditions are considered non-communicable diseases (NCDs), also known as chronic diseases, that tend to last for several years or for life and nutrition is part of the prevention and treatment. Traditional cuisine in the CR consists of meals centered on meat and starch with dietary patterns that often contain high amounts of salt and saturated fat with limited fruit and vegetable intake.^{35,36} Higher intake of salt and saturated fat is consistent with elevated rates of chronic conditions such as cardiovascular disease.³⁷ In addition, overweight and obesity are considered preventable factors that can impact the development, treatment and progression of many NCD's including CVD. According to the State Health Institute in Prague, in a 2014 population survey nearly half of adults aged 25-64 were at high or increased risk of CVD. In addition, one quarter had pre-diabetes and 64% of the adults were overweight or obese.²⁷ With a death rate from preventable diseases that is higher than the EU average, the WHO identified that a large proportion of the population morbidity in CR is due to poor lifestyle including eating habits.^{33,36} Not surprisingly, in addition to adults overweight and obesity are impacting children. Between 2002 and 2014, the rates of overweight and obesity have risen for boys (18% to 25%) and girls (8% to 12%).³⁸ Thus it is important to consider that nutrition may

play a role in several diseases impacting a wide range of people in the CR. Due to the great concern for cardiovascular health in CR, Lustigova et al³⁹ identified that in addition to NCD's and lifestyle choices, education was the strongest determinant of CVD risk among the CR population, estimating that those with less formal education had nearly twice the risk of developing CVD than university educated participants. The authors emphasized the importance of cardiovascular health literacy to reduce associated health disparities related to education. Health literacy (HL) is the set of skills needed to function effectively in the healthcare environment.⁴⁰ A 2016 study of HL in CR identified that a majority of respondents, 6 in 10, had limited HL,⁴¹ as compared to 8 in other EU countries surveyed; only Bulgaria had higher rates. This underscores the importance of physicians and other health professionals offering nutrition education in ways to promote patient understanding. In addition to CVD, recent studies identified malnutrition as concern for the elderly residents of CR with nearly half of institutionalized elders assessed as malnourished (10%) or at risk of malnutrition (39%).⁴² In addition, a separate study Brabcová et al²⁸ reported that more than a third of home bound elders assessed were at risk of malnutrition. Overall, the authors suggest that proper assessment as well as addressing a variety of nutrition and non-nutrition factors can be important for the prevention and treatment of malnutrition, thus underscoring the importance of nutrition education for physicians to identify this problem.

Recognizing the importance of how lifestyle and behavioral factors can impact health, the government of CR prepared Health 2020,⁴³ a national strategy in order to improve the health of the population and reduce incidence of preventable diseases and

premature deaths. The aims of this initiative are comprehensive and include four priority areas including “strengthening people-centered health systems, [and] ensuring the availability and accessibility of health services.” This aim identifies that “revitalizing public health requires reforming the education and training of health professionals. They should focus on the new people-centered methods to promote and protect health and prevent disease.” This was supported by the Food Safety and Nutrition Strategy aim to include nutrition and diet in the education of healthcare professionals.⁴⁴ There are a number of health professional programs in CR that may benefit from this initiative, and the Health 2030 framework builds on this through an emphasis on disease prevention, improving access to primary care as well as promoting the health literacy of the population.³⁶

Education and training programs for health professionals are available at Masaryk University (MU), the second largest university in the Czech Republic with ten faculties, over 200 departments and approximately 30,500 students enrolled.⁴⁵ The MU Faculty of Medicine offers programs in medicine and allied health including general medicine, dentistry, dietetics, nursing, nurse-midwife and physiotherapy.⁴⁶ Started in 1919 the program in general medicine has expanded over time to accommodate students from outside of the Czech Republic by offering medical education in both the Czech and English languages. According to MU statistics in 2018, approximately 2,295 students were enrolled in the 6-year program, with the majority (89%) taking classes in Czech.⁴⁷ Although students must be conversant in the Czech language to complete the clinical portions of the program, it is likely that some students will practice medicine outside of

the Czech Republic as the medicine degree from MU is recognized in many countries including the USA and in the European Union.⁴⁸

The MU department of public health is part of the faculty of medicine and offers degree programs in dietetics and the faculty and staff provide nutrition education in the curriculum of MU medical students. A recent assessment documents that nutrition topics are included in the general medicine curriculum as part of public health II practice education.²⁶ The faculty and PhD students from the department of public health, including several dietitians, teach public health topics during year 3 of the training providing an estimated ten hours of nutrition education to medical students in both the Czech and English programs. The topics offered are determined by the public health faculty and include childhood and adolescent hygiene, nutrition I and II, nutrition status assessment, dietary consumption, and evaluation. Nutrition I & II provide an overview of the fundamentals of nutrition including nutrients, nutrition in chronic disease, using nutrition guidelines and tools such as reading food labels.

Additionally, starting in 2007 the department of public health offers bachelor's and master's degree programs in dietetics. Recent enrollment data reported 64 students in the 3-year bachelor's dietitian program, and 29 students in the 5-year master's dietitian program that is a continuation from the bachelor's program and prepares students to provide adult or pediatric medical nutrition therapy (MNT),⁴⁷ which is defined as "nutritional diagnostic, therapy, and counseling services for the purpose of disease management which are furnished by a registered dietitian or nutrition professional."⁴⁹ Students must complete internship hours and pass both oral and written exams to finish

the program, and upon graduation are considered dietitians similar to the registered dietitian (RD) designation in the USA. But there is a long history of dietetics education and practice in the Czech Republic that is based on a traditional role in food service. With approximately 2,500 dietitians in 2019,⁵⁰ there are currently three separate professional organizations and three different approved levels of education ranging from high school programs to university degrees, yet all have the same scope of practice as per CR legislation.⁵¹ Thus, the current education system in CR prepares dietitians with different levels of knowledge and skills, which combined with the long-standing association with food service creates misunderstanding about their role in clinical practice.

The overall goal of this study was to examine the perceptions of nutrition education and the role of dietitians by students and faculty at Masaryk University medical school in the Czech Republic. The study planned to answer the question, **what are the perceptions of nutrition education in medical school?**

To fully address this question, the following specific aims were identified:

- 1. To identify and describe the perceptions of MU medical students about the role of dietitians and nutrition in medical care and about the nutrition education offered in the medical school at MU.**
- 2. To identify and describe the perceptions of the MU medical school faculty about the role of dietitians and nutrition in medical care and about nutrition education for MU medical students.**
- 3. To identify any barriers to nutrition education in the medical school at MU**

4. To develop recommendations for offering nutrition education at the MU medical school based on findings from the analysis of the interviews including barriers identified.

This study identifies and describes the student and faculty perceptions of nutrition education offered to medical school students at MU as well as perceptions of dietitians and barriers to nutrition education. To date, as far as is known based on a review of the published literature, this is the first assessment of this kind conducted at MU medical school and possibly any medical school in the Czech Republic.

Statement of Innovation

The lack of nutrition education in medical school may result in missed opportunities for nutrition assessment and for offering nutrition education and counsel to patients possibly leading to improved health outcomes. Although some medical students have identified that nutrition education is lacking and many desire additional education and training in related skills,⁵²⁻⁵⁵ it is unclear if this describes the situation at medical schools in the Czech Republic. Relevant context is essential, with many studies conducted at single sites with different medical education systems, the results may not be generalizable to CR. In addition, as the Czech Republic emerges from the post-communist era, with a medical school that offers programs in English and Czech combined with the recent changes to the education system for dietitians, it is important to assess the situation here. The current proposal is part of an overall research proposal at MU titled: **Deepening of knowledge in the field of health risks and benefits of nutrition, environment, and lifestyle**. It was conducted as part of the sub-research

project, **Nutrition from theory to practice**, which has separate programs designed to assess not only the perceptions of faculty and students about nutrition education but also the MU medical school curriculum, the nutrition knowledge of medical students and to evaluate the quality of the nutrition care system in the Czech Republic. Thus, this project represented an innovative and timely approach to contribute to a comprehensive assessment of nutrition education and care, identify key themes, gain insights, recognize barriers, and make specific recommendations. In addition, this assessment may serve as a model for similar assessments at other medical schools in the Czech Republic and Europe, thus providing opportunities to assess nutrition education and provide recommendations to improve nutrition care for more patients. Furthermore, considering the interdisciplinary nature of medical care and certainly the importance of nutrition training for other health care providers, it is anticipated that a next step will be to conduct similar studies to assess perceptions about nutrition education in other health-related training programs in the MU faculty of medicine including the departments of nursing, physiotherapy, pharmacy, and midwifery. Thus, the assessment of perceptions regarding nutrition education will have potentially broad effects in many disciplines, thus enhancing the opportunities to positively impact patient nutrition care in CR, Europe and throughout the world.

This research project was planned and managed in collaboration with the faculty and students from the MU Department of Public Health.

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CHAPTER II

LITERATURE REVIEW

In the context of medical school, nutrition education can be defined as the introduction of scientific principles of nutrition into the clinical practice of medicine and is focused on preparing physicians to incorporate nutrition into the recognition, treatment and prevention of acute and chronic illness to meet the needs of patients and the public.^{1,2} Nutrition is at the forefront of health and disease playing a role in both prevention and treatment^{3,4} with evidence to support that nutrition interventions reduced morbidity and medical costs.⁵⁻⁹ Physicians have an important role in the identification, assessment and education that are essential for nutrition related health conditions throughout the lifespan. This is demonstrated in the clinical care guidelines for cardiovascular disease, where nutrition is a primary intervention.³ The physician's role is further enhanced and patient care improved when they work as a part of an interdisciplinary care team^{2,10,11} including to prevent, manage, and treat noncommunicable chronic diseases (NCDs), such as obesity, cardiovascular disease, diabetes malnutrition and certain cancers.^{5,9,12,13} Thus, with nutrition as part of the treatment guidelines for many NCDs^{3,4} and global rates on the rise,¹⁴ it is important to consider relevant research about the nutrition education for future doctors.

Nutrition Education in Medical School

The medical training for physicians differs around the world, including between the US and Europe.¹⁵ In the US, physicians are typically trained during 4 years of medical school which follows 4 years of undergraduate education. The US medical school system consists of 2 years of basic sciences and 2 years of clinical training followed by an additional 3-5 years of residency training, which includes clinical and classroom experience. While in Europe the training starts after secondary school and consists of a 6-year curriculum consisting of a 2-year segment of preclinical teaching of the basic sciences and a 4-year clinical segment providing students with training in the practical aspects of medicine.¹⁵ The importance of including nutrition education in medical school has been discussed for decades with the US National Research Council recommending 25-30 hours of nutrition education for US medical schools,¹⁶ but there is currently no standard recommendation for European medical schools.¹⁷ Despite this, the Council of Europe recognized in 2003 that insufficient education related to nutrition is a barrier for doctors and identified a need for increased nutrition knowledge.¹⁸ Nonetheless the lack of nutrition education in medical schools and residency programs has been well documented in the scientific literature.^{17,19-21} A 2012 survey of accredited US medical schools¹⁹ reported an average of 19 hours of nutrition education. Most institutions (71%) failed to provide the recommended hours of nutrition education, with 4 in 10 providing less than half of the recommendation. But perhaps physicians trained in the US are getting additional nutrition education and training during their residency after medical school. In an assessment of US residency programs, Daley et al reported poor nutrition

education in residency training. Despite a majority of respondents (78%) offering some nutrition education, only a quarter had some formal curriculum and 15% had none at all.²⁰ While this research provides insight into nutrition education in US medical schools, there is less information reported from European schools. In a 2013 survey of the medical education directors for medical schools in 14 countries a majority (69%) reported that some form of nutrition education is required for medical students.¹⁷ Compared to the survey of US medical schools, the average number of hours offered was higher in the Western EU medical schools (23.6 vs 19), but these results offer limited insight due to the poor response rate (15% of 217 schools contacted) and included no information from medical schools in the Czech Republic (CR). A subsequent survey by the European Society for Clinical Nutrition and Metabolism (ESPEN) in 2017 included results from medical schools from the 22 European countries on its Council, and showed similar results with most reporting that current levels of nutrition education are inadequate.²¹ Once again CR was not included in the results, but in a 2019 assessment of the curriculum at the Masaryk University medical school in Brno, CR, Kapounova et al estimated 19.5 hours of nutrition education for medical students²²; thus, identifying limited nutrition education for future doctors in the CR with estimated hours below both the European average¹⁷ and standard recommendations.¹⁶ In addition to hours of education, St Jeor et al²³ supported the importance of further integrating nutrition education throughout the medical school curriculum and reported that it improved clinical practice skills and was rated highly by students. Additionally, the 2020 ESPEN Nutrition Education in Medical Schools Initiative (NEMS) proposed that medical

students require “evidence-based nutrition education to understand the importance of nutrition in health and disease.”²⁴ Thus, it is important to assess the perceptions of the nutrition education offered in medical school.

Perceptions of Nutrition Education in Medical School

Several studies assessed the unique and valuable perspectives that medical students and physicians provide.^{25–28} Danek et al reported that medical students and physicians from one US school thought nutrition was poorly integrated into the curriculum and did not see nutrition counseling routinely performed. Dominant barriers to counseling patients about nutrition were identified including lack of time during the appointment, pressure to see large numbers of patients each day and the teaching physician’s lack of knowledge about nutrition. Additionally, due to a lack of knowledge about nutrition, students reported not offering nutrition counseling to patients and expressed frustration because they did not know how to give advice in a simple manner to promote understanding. Overall, the authors concluded that nutrition education in this medical school is inadequate and students need to learn not only about nutrition but also about counseling techniques.²⁵ This is supported by the results of semi-structured interviews with US medical students that reported barriers to childhood obesity prevention and treatment including a lack of knowledge and limited time.²⁹ Several studies have systematically assessed student perception of nutrition education in different countries including Ghana, Australia, Canada and the United Kingdom (UK).^{26,27,30,31} Recognizing that doctors are well positioned to provide scientifically based nutrition advice to patients, these studies surveyed medical students to examine the perceived

importance that they place on knowledge about nutrition in disease management and their self-efficacy about offering counsel regarding the role of nutrition in the management of NCDs. The overwhelming majority agreed that the assessment of nutritional status is essential and recognized the importance of providing specific dietary recommendations regarding NCDs, but less than half were confident in their knowledge to provide nutrition education or counseling.^{26,27,30} Some barriers identified included the faculty's lack of knowledge in clinical nutrition, poor collaboration with nutrition professionals and the perception that nutrition education was not the responsibility of doctors. The belief that nutrition is not part of a doctor's role was not universal, as reported in a survey of medical students in the UK where 7 in 10 agreed that having a strong understanding of nutrition is an important aspect of a doctor's job and thus should be included in the medical curriculum. However, only 1 in 10 of these students reported that nutrition was 'regularly emphasized' by the senior clinician they shadowed.³¹ In a study of physicians and medical students in Israel, Shai et al reported that students thought nutrition interventions were a higher priority than did the physicians. In addition, when participants were asked why they did not use a nutrition treatment for disease, almost half of the physicians responded it was due to lack of time or lack of awareness of treatment possibilities. Whereas two thirds of the students reported that the physicians' lack of awareness about a treatment was the reason for not initiating it.³² There are other factors that may impact the student's perspective on their role in nutrition related education and care including when nutrition education is offered and what topics are included.

Timing of Nutrition Education and the Topics Included

Several studies^{30,33,34} discussed the timing of nutrition education in the medical school curriculum and reported more negative views of nutrition education for students that are further along in their training. This may be partly due in part because most of the nutrition education is offered in pre-clinical years, and then not reinforced from clinical faculty and mentors during clinical experiences. Franz et al prepared a summary of nutrition's role in medical education over the past decades and suggested that medical students' perception of the importance of clinical nutrition can decrease during medical school. The authors reported that "future physicians expect to be trained in nutrition and intuitively seem to understand the importance of nutrition in clinical practice, but something happens during training, and students become disillusioned or misguided with their understanding of the importance of nutrition in clinical practice." The authors also stressed that "no matter how well students are prepared by their medical school courses, if their preceptors do not emphasize nutrition in clinical practice, that training is not effective"³⁴ thus emphasizing the importance of nutrition education and training for both students and their physician preceptors and integrating nutrition concepts within the existing curriculum.³⁵ In addition to emphasis and timing, the content of nutrition education is important at different points in the medical school curriculum. Some research identified that including education for personal nutrition and cooking offers important skills in the early years, while training for therapeutic diets and counselling patients provides key knowledge and skills for future doctors in later years as they

prepare for practice.^{36,37} Thus it may be important to assess how the faculty's emphasis on nutrition can impact the education offered to medical students.

Emphasis and Enthusiasm for Nutrition Education

A survey conducted in UK medical schools identified that the presence of a nutrition lead on the faculty was associated with a trend toward greater mean time allocated to nutrition education.³³ Furthermore, with a foundation in education and clinical experience, it is the position of the Academy of Nutrition and Dietetics (AND) that registered dietitians (RDNs) should play a significant role in educating medical students, residents, fellows and physicians in practice.² The authors suggested that the more physicians learn about the effectiveness of nutrition for the prevention and treatment of diseases, the more likely they are to consult with RDNs and refer patients for medical nutrition therapy, which will improve medical care and has the potential to reduce health care costs.² Dietitians have an important role to play as a member of the interdisciplinary care team, to conduct nutrition assessments, provide medical nutrition therapy (MNT) and nutrition education to patients as well as in curriculum development and offering medical nutrition education to students in medical school. MNT is nutrition-based treatment provided by a dietitian.^{38,39} In addition to MNT dietitians are increasingly involved in providing nutrition education to medical students,^{23,40-44} with Master's level dietitians delivering lectures about nutrition guidelines and counseling,⁴² planning and developing courses including culinary nutrition,⁴⁰ and facilitating multidisciplinary sessions on skills for nutrition counselling and nutrition assessment.^{43,44} The direct involvement in education provides not only qualified faculty to teach nutrition, but also

the opportunity for medical students to interface with dietitians and learn about their role in medical care. Burch et al.⁴⁴ conducted a qualitative assessment with dietitians from several countries around the world to assess their perspectives about teaching nutrition to medical students. Although the results suggested that dietitians are appropriate to work as nutrition educators in medical schools, several common themes emerged including that the participants were “uncertain that the nutrition education received by students prepared them for later health care practice.” This uncertainty may be due in part to “limited contact hours dedicated to nutrition and the separation between nutrition and other medical subjects.” In addition, most of the participants perceived that nutrition education was not supported by the medical faculty and due to poor curriculum planning that nutrition is less essential than other subjects. These concerns are further demonstrated in the literature reporting that nutrition topics are not represented on exams^{44,45} and that many schools do not offer a dedicated nutrition course³⁷ despite support from students.²³ Burch et al concluded that further assessment and education is needed for medical school faculty and administration about the role of nutrition in medical care, and support for increased involvement of dietitians in curriculum planning and development may enhance the nutrition education of medical students.⁴⁴ Despite the limited emphasis on nutrition education in medical school, patients continue to seek nutrition advice from their doctor.⁴⁶⁻⁴⁸

Physicians as Source of Nutrition Information

While some doctors do not feel adequately trained in nutrition,^{18,25,32,49} several surveys show that patients view them as a trusted source of advice on a range of issues,

including nutrition. A 2008 survey in the US by the AND reports that 61% of respondents identified doctors as a credible source of nutrition advice.⁴⁷ In a survey of EU residents, 91% reported that health professionals are a trusted source of information on healthy eating.⁴⁸ Furthermore, a survey in the Netherlands ranked physicians highest for perceived reliability and expertise with respect to health and nutrition information and indicated that physicians have the highest potential to communicate effectively about nutrition topics including lowering cholesterol, losing weight and food allergies.⁵⁰ Despite this perception, a survey of Dutch physicians⁵¹ reported that they were more likely to offer guidance to patient on physical activity versus nutrition because of their lack of self-efficacy for providing nutrition specific recommendations. In addition, while a lack of time was identified as a barrier for nutrition guidance it was not noted as a barrier for guidance on physical activity. But physician advice may have an important influence on patient behavior, with the 2018 International Food and Information Council survey reporting that 78% of patients that received nutrition information from their doctor changed an eating habit based on that conversation.⁴⁶ Thus supporting the need to include training and practice on offering nutrition guidance in medical school. Vetter et al reported that while fewer than one-third of medical school students expressed confidence in their ability to assess the nutrition status of a patient or discuss general nutritional issues, a majority (89%) expressed proficiency in discussing the benefits of exercise with patients.³⁰ Therefore, considering the opportunities and barriers identified, it is important to assess possibilities for collaboration with other health professionals to provide nutrition care.

Interdisciplinary Education and Care

The term interdisciplinary education considers learning across disciplines or fields of study¹¹ and when considering interdisciplinary nutrition education, several studies support the benefits of collaboration between health professions.^{27,52} These studies reported that a majority of medical students agreed that an interdisciplinary approach to nutrition education would be beneficial. More specifically the medical students reported that dietitians should be involved in their training and that they supported a dietitian referral for patients requiring specific nutrition advice.^{27,52} The notion of interdisciplinary collaboration among health professionals is also supported by the Institute of Medicine (IOM) as a recommendation for inclusion in the curricula for health practitioners.¹¹ This collaboration currently exists for medical schools that employ dietitians to educate medical students,^{23,42,43} including MU where dietitians are teaching nutrition topics in the public health curriculum. In a study of Canadian medical students⁵³ a majority thought that their program should dedicate more time to nutrition education, and that learning in an interdisciplinary setting was preferable. The opportunity for dietitians to support the services of physicians is not new. In 1994 McLaren et al⁵⁴ proposed the use of nutrition consultations as an important part of care when the physician recognized a medical condition that warrants consultation, and this type of collaboration continues to have support from medical students and physicians.^{26,55} Therefore, it is essential that medical education for future doctors provides opportunities to learn more about the identification of nutrition related medical conditions, a recognition of the dietitian's expertise and identifies the process for making appropriate referrals.^{2,56} Regarding the support for

nutritional intervention by a dietitian, Mogre et al reported that the majority of medical students (71%) were supportive and over 50% reported dietitians as their source of nutrition information thus supporting the role of interdisciplinary care between doctors and dietitians.²⁷

Literature Summary

Despite a significant body of evidenced-based research supporting the role of nutrition in the prevention, treatment, and management of disease, along with the important role of doctors to provide nutrition care, the literature reported a lack of emphasis on nutrition education in medical schools across the world. Research has identified barriers including a crowded curriculum, limited emphasis on nutrition education in the coursework and clinical training, as well as clinical faculty that are not demonstrating how to address nutrition in patient care. Yet students in medical schools expressed interest in more nutrition education to improve their self-care and advise patients. But each country and medical school environment is unique and results from these studies may not be generalizable. Thus, while recent research estimated that the number of hours of nutrition education are less than optimal at MU medical school in Brno, Czech Republic, gaps in knowledge remain about the perceptions of the nutrition education by students and faculty at MU and supports the need for further research.

Significance

Evidence-based research documents the important role of nutrition in medical care, and thus represents opportunities for prevention, management, and treatment of many diseases. With almost half of adults aged 25-64 at risk of NCDs,⁵⁷ the importance

of adequate nutrition education for doctors and emphasizing the role of dietitians in healthcare and education cannot be underestimated. Despite abundant literature from around the world documenting inadequate nutrition education in medical school, the CR is not represented. Therefore, this was a critical time to assess the situation in CR. This project focused on assessing perceptions of medical students and faculty about nutrition education and the role of dietitians at MU medical school in Brno CR. The project team included a faculty member and student affiliated with the MU Faculty of Medicine which provided access to our study population. This combined with their training as dietitians, interview experience and language skills in both English and Czech, qualified the researchers to conduct this study at MU. The information gained from this research may serve to improve nutrition education for future doctors, increase awareness and support for the role of dietitians, and ultimately improve nutrition related care for people in the Czech Republic.

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CHAPTER III
A HISTORICAL PERSPECTIVE OF DIETETICS EDUCATION AND
PRACTICE IN THE CZECH REPUBLIC

Abstract

Background: Food and nutrition play an essential role in human health. Evidence-based research supports the important role of dietitians providing medical nutrition therapy for the prevention, management and treatment of many diseases and conditions. Officially recognized in 1951, dietitians (formerly dietary nurses) have an important history in the Czech Republic.

Aim: This narrative review aims to examine the history of nutrition care and the role of dietitians in the Czech Republic. We include information about education, relevant legislation, licensure, scope of practice, the current workforce, and existing professional organizations. The article provides an assessment of the opportunities for the future development and professionalization of dietitians.

Methods: We used licensed, electronic databases PUBMED, CINAHL, EBSCO, MEDVIK to search the professional literature as well as hand searching publications in both the Czech and English languages including current legislation and statistical information.

Results: Formal dietetics training has progressed from the preparation of therapeutic meals to university level programs offering science-based training with supervised

clinical practice to prepare bachelor's and master's level dietitians. As a nationally recognized profession there are three professional associations supporting more than 2,500 dietitians in the Czech Republic. Despite these developments, the advancement of the profession remains inadequate due to a limited scope of practice, wide variation in education amongst dietitians, no requirements for licensure and underutilized competencies.

Conclusions: Despite the long history and development of this profession, dietitians in the Czech Republic remain an underutilized resource to provide a wide variety of nutrition services. Thus, in an effort to expand their scope of practice and improve nutrition care, further research is needed within the Czech Republic to demonstrate their essential role in the prevention, treatment and management of many diseases.

Introduction

Dietitians are the health professionals with education and training in nutrition and dietetics¹. Evidence-based research documents the significant benefits of dietitians providing medical nutrition therapy (MNT) to improve health outcomes and reduce health care costs for various conditions including non-communicable diseases such as obesity and diabetes.¹⁻³ In order to keep pace with the global advancements of the dietetics profession, the European Federation of the Association of Dietitians (EFAD) reports ongoing efforts for European Union (EU) member countries to follow a standardized system of education for dietitians and to allocate resources for coverage of dietitian services within the healthcare system.⁴ While a healthy diet was a part of spa therapy in the Czech lands centuries ago, over the past decades, like many countries

around the world, the World Health Organization (WHO) reports rising rates of obesity and associated chronic diseases with nutrition as a risk factor.^{5,6} So, what is the status of dietetics education and the role of dietitians in the Czech Republic? We conducted a literature search in PUBMED, CINAHL, EBSCO and MEDVIK using the search terms dietary nurses, dietitians, nutrition education, scope of practice, allied health, and the future of dietitians to assess this question. The history of education and the practice of Czech dietitians is documented in a few publications.⁷⁻⁹ This is the first narrative review to summarize the available information including historical, legislative, and statistical data in order to present a comprehensive history, current assessment including challenges for the advancement of the profession and to propose a future path for Czech dietitians.

Diet Therapy in Czechoslovakia

For hundreds of years nutrition has had a role in Czech medical care related to traditional spa treatments which included diet therapy. In 1522 Dr. Wenceslaus Payer wrote about the treatments found in the Czech spa town of Karlovy Vary where therapy regimens included not only spa treatments and the consumption of the local mineral waters, but also emphasized the patient's lifestyle and nutrition habits.⁹ Over the following centuries several books were written by doctors and professional chefs focusing on healthy nutrition, recipes and the use of special diets to treat disease.⁹ Perhaps the most important publication was *A New Diet System for Hospitals (Nový dietní systém pro nemocnice)* written by Dr. Přemysl Doberský,¹⁰ a general internist from Czechoslovakia. Published in 1955, this book was inspired by the hospital diet system in the Soviet Union and became the national standard for the preparation of therapeutic diets

in hospitals and spas in Czechoslovakia.¹⁰ Doberský's diet system has endured for decades and remains widely used in hospitals and other health facilities throughout the Czech Republic, but moving forward the 2020 guidelines from the Ministry of Health support current findings from evidence-based medicine and may serve to promote changes in institutional dietary systems.¹¹ The proper use and preparation of therapeutic diets remain an important part of the healthcare system and require not only updated guidelines, but also well-trained staff. Therefore, over the past decades there has been an evolution of the education system for dietetics professionals working in the Czech Republic (CR).

Education of Dietary Professionals

Dietary Workers (Dietní Pracovnice): 1934–1950

Despite the published recommendations for dietetics and therapeutic diets at the beginning of 20th century,⁹ health facilities in Czechoslovakia did not have any workers trained to prepare food for patients with special dietary needs. Thus, in 1934 the Ministry of Health established the first school for the education of dietary workers in Prague (Vyšší škola pro vzdělávání dietních pracovnic).⁷ The curriculum included cooking and therapeutic meal preparation along with math, Czech language, and some clinical subjects that were taught by medical doctors. The school started as a one-year program that was later extended to two years. During their training, the students gained practical experience by preparing standardized therapeutic meals for patients in the internal medicine clinic of Dr. Prusík.⁷ Upon graduation, the dietary workers were qualified to prepare therapeutic diets based on a doctor's prescription and most were employed in the

food service departments of healthcare facilities.⁷ The cooperation between the school and Dr. Prusík's clinic demonstrated the essential role of dietary workers at that time.

During the post-war period in 1948 the Ministry of Education standardized the curriculum of the schools that provided education for health care professions to four years.¹² All students received the same education during the first two years and discipline specific courses for years three and four.¹³ Students were admitted starting at the age of 15 and the program emphasized strict hygiene along with the respectful and ethical treatment of patients.⁷ Another school for practical dietetics was established in Brno,¹⁴ and by 1949 there were ten schools educating dietary workers in Czechoslovakia,⁷ thus demonstrating growth and interest in the profession.

Dietary Nurses (Dietní Sestry): 1951–2003

The 1950's brought significant changes for health professionals through new legislation that designated responsibility for their education to the Ministry of Health.^{13,15} More specifically, the graduates of these specialized colleges were recognized as mid-level health professionals and Dietary Workers were given the title of Dietary Nurse (DN).¹⁵ The association of dietetics with nursing was important not only because the DNs were identified as healthcare professionals, but they also had new educational standards and practice guidelines. These included an education program that followed a standardized curriculum, the requirement to pass a standardized examination at graduation and job responsibilities based on a specific scope of practice.^{15,16} DNs were employed as food service professionals and classified according to their scope of practice (SOP) and level of responsibility with DN Managers as the most senior level

professionals, followed by the Head of DNs and then DNs themselves.¹⁷ To support the professional growth and development of the healthcare workforce, starting in 1960 the National Centre for Nursing and Allied Health Professions (NCONZO) managed the continuing education requirements for DNs and other allied health professionals. Furthermore, a decade later NCONZO offered additional education to DNs providing them with an opportunity to earn specialized qualifications in Population Health Education or in Nutrition and Metabolic Disorders.^{18,19} This aimed to support the advancement of the profession.

Recognition of Dietitians

Despite some evidence that the SOP for DNs was increased over time,²⁰ the perception about their role in healthcare did not, indicated by Pavličková expressing that *“Dietary nurses represent a very important profession, which is still underappreciated.”*⁸ Their importance was demonstrated in 2004 when Czech legislation established a completely new system for the education, practice, and licensure of allied health professionals (AHPs) including dietitians. This law and its decrees designated the position of dietitians as a health profession and documented the necessary qualifications and scope of practice.^{21,22} In addition, it promoted the advancement of dietetics education by supporting university level programs for dietitians. These legislative changes further strengthened the professionalization of dietitians in the Czech Republic through enhancing in-country education programs, defining the SOP, and establishing licensure requirements for all AHPs. The requirement of a license to practice is an important form of recognition of AHPs and designed to protect the health and safety of the public by

requiring that licensees meet minimum degrees of competence as well as ongoing lifelong learning requirements. An additional part of the new legislation was the determination that dietary nurses are now recognized as dietitians, too. This change of professional title happened overnight, without any further training or education required for the DNs. Therefore, in the Czech Republic there are currently three groups of dietitians, all with the same SOP but having quite different levels of education – either high school, college (a specialist with diploma) or a bachelor's degree. Additionally, former dietary nursing study programs at high schools were transformed into programs preparing dietetic assistants, a profession with a similar SOP, but with the requirement to work under the supervision of a dietitian.²¹

As shown in Figure 1, there are currently two ways to become a dietitian: graduating from a college (a specialist with diploma) or a university (bachelor's degree), both of them offering three-year study programs.²¹ Despite some previous efforts in 1990s, the first bachelor programs of dietetics started in 2007 at the 1st Faculty of Medicine, Charles University, Prague, and in 2008 at the Faculty of Medicine, Masaryk University, Brno.^{23–25} Currently, there are five faculties of four universities (Brno, České Budějovice, Prague, and Ostrava) and seven colleges educating new dietitians according to a curriculum decree and dietetic qualification standard.^{26–28}

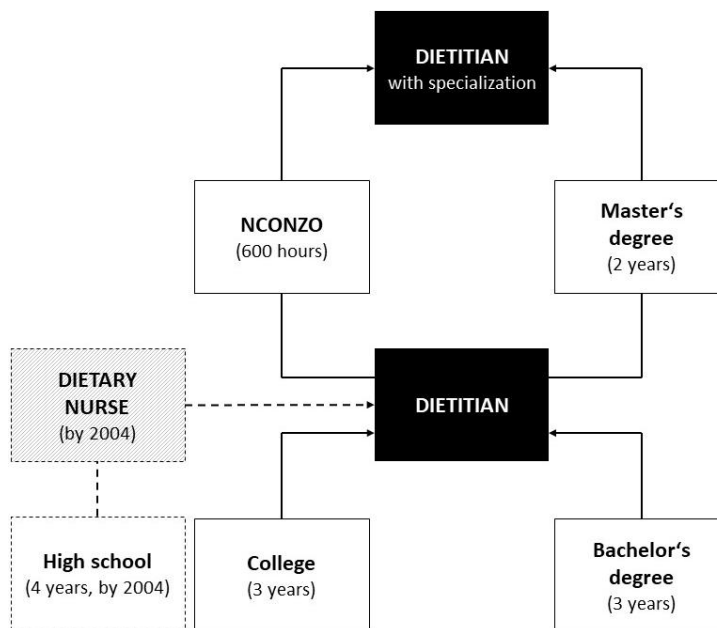


Figure 1. The Education of a Dietitian.

Furthermore, all groups of dietitians can earn a specialized qualification by completing an additional study program at NCONZO or by completing the university level 2-year master's degree study program in Brno or Prague which is only open to university graduates. Since the 1960's, the system of specializations has undergone several changes until the program "Nutrition of Adults and Children" was approved in 2017 with its obligatory curriculum issued in the Bulletin of the Ministry of Health in November 2019.²⁹

Since the specialization study program in NCONZO is open for any dietitian, the outcome is the same as stated above resulting in four types of dietitians with the same SOP (i.e., specialized high school graduate, specialized college graduate, specialized bachelor graduate and master graduate). This concurrence has been criticised by the National Health 2020 Strategy for CR which identifies that the current training for AHPs

with different education levels but without any difference in SOP is non-effective and a waste of money allocated for pre-gradual education.⁶ Despite these concerns, to date there has been little progress with no proposed amendments to the law.

Dietitian's Scope of Practice

The SOP of a dietitian in the Czech Republic includes clinical skills such as taking a patient's nutrition history, examining the patient's nutritional status, offering nutrition education to the patient, and the development of meal plans (both individually and for the facility). Specialized dietitians can also prepare nutrition education materials, assess a patient's nutritional status, train other health professionals in nutrition, and conduct research (see Table 1). Unfortunately, the terminology coming from the legislation tends to be confusing and unclear, causing further problems in practice. Furthermore, as can be seen in the nutritional status assessment, the difference of scope of practice between dietetic assistants and dietitians is non-systematic. Regarding a patient's diet order or clinical nutrition needs including oral nutrition supplements (ONS), tube feeding, and parenteral nutrition, these can be prescribed by the attending physician based on the dietitian's recommendation.³⁰ In outpatient settings, the dietitian cooperates with the MD Nutritionist, who is the bearer of the functional licence F016 issued by the Czech Medical Chamber, and the only medical professional with the authority to prescribe all the means of enteral (ONS, tube feeding) and parenteral nutrition for outpatients.³¹ Other doctors including oncologists, geriatricians and surgeons are authorized to prescribe ONS for patients, but only for a limited number of choices on the formulary.³²

Table 1

Scope of Practice of Different Dietitians According to Their Level of Education

Scope of practice	Dietitian – not specialized					Dietitian – specialized				MD
	DN (before 2004)	DA	HS	DiS.	Bc.	HS	DiS.	Bc.	Mgr.	
Food service										
Meal plans	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Meal preparation	Y	Y*	Y	Y	Y	Y	Y	Y	Y	
Food service management	Y		Y	Y	Y	Y	Y	Y	Y	
Assessment										
Nutritional history taking and evaluating			Y	Y	Y	Y	Y	Y	Y	
Nutritional status examination			Y	Y	Y	Y	Y	Y	Y	
Nutritional status assessment		Y*				Y**	Y**	Y**	Y**	
Per os dietary assessment			Y	Y	Y	Y	Y	Y	Y	
Nutritional intake documentation		Y								
Nutritional calculations		Y								
Care										
Diet assignment										Y
Individual meal plan composition		Y*	Y	Y	Y	Y	Y	Y	Y	
Education	Y	Y	Y	Y	Y	Y***	Y***	Y***	Y***	
Education materials creation						Y	Y	Y	Y	
Facility										
Training of other employees						Y	Y	Y	Y	
Quality assessment						Y	Y	Y	Y	
Research on site						Y	Y	Y	Y	
Teaching in specialization courses						Y	Y	Y	Y	
Artificial nutrition										
EN prescription										Y
PN prescription										Y

Caption: DN – dietary nurse; DA – dietetic assistant; HS – high school; DiS. – college degree; Bc. – bachelor's degree; Mgr. – master's degree; MD – medical doctor
 Y – yes * – not in special diets/complicated diseases ** – in order to identify possible complications *** – also in special diets

Legal Protection of Dietitians

Dietitians study a wide variety of courses focusing on food, nutrition, counselling, and management and the purpose of following a standardized education program and requiring a license is to protect the nutritional health, safety and welfare of the public by encouraging high standards of performance in the profession.³³ For example in the United States, most states require dietitians to be licensed and their practice is protected and exclusive for dietitians.³⁴ From 2004 to 2017 the CR required a license and ongoing education for AHPs including dietitians,²¹ but legislative changes enacted in 2017 cancelled the requirements for licensure as well as ongoing lifelong learning for dietitians.³⁵ Unfortunately, this legislative change compromises two key elements

designed to protect the welfare of the public and support the development of health professionals, including dietitians. Removing licensure requirements hinders the mechanism to manage the minimum standards of competency for health professionals and without continuing education requirements, AHPs can continue to practice without remaining current about professional developments and research. More specifically, in the Czech Republic, the only protection identified is the use of the term “dietitian” as no one except for the designated professionals can use this name.²¹ However, dietitians in private practice do not have practice exclusivity guaranteed and unfortunately many lay people do not realize the difference between a dietitian (AHP) and a nutritionist. An important designation in the Czech Republic is that a nutritionist, unlike a dietitian, is not officially recognized as a health care professional because they have not completed the standardized education and training required for dietitians.

Current Workforce

Along with other AHPs, in 1951 DNs were classified as mid-level health professionals and their numbers in healthcare facilities gradually increased starting in 1957 (see Figure 2) and doubled by 1983 (3.67 to 7.44 DNs/10⁵ population).³⁶ Despite some inexplicable variability over the following decades, at 8.05 dietitians per 100,000 population in 2019 the number of dietitians is comparable to other developed countries being below the US (23), UK (13) or Austria (9) but more than Germany (4) France (4) or Belgium (6).^{36,37}

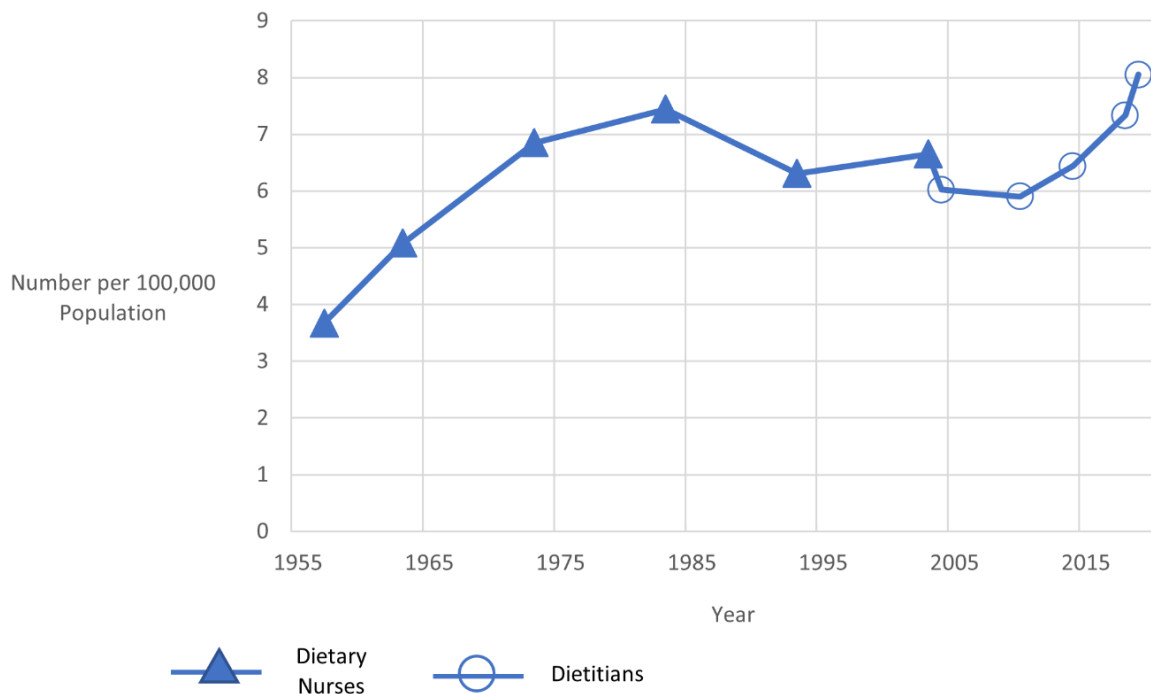


Figure 2. Nutrition Workforce (1957–2019).³⁶

In October 2019, there were 2,566 dietitians registered with 857 (33.4%) dietitians employed in healthcare facilities and a median age of 40–44 years.³⁸ With no employment registry outside of healthcare and social services, it is not possible to confirm the employment of other dietitians, but it is likely that they are working in private practice, or in many other areas, e.g., National Institute of Public Health, education institutes, school canteen services, agriculture, food and pharmacy industry and others.

Additionally, there were 428 dietetic assistants with only 33 of them (7.7%) employed in the healthcare facilities.³⁸ Employment information for dietitians remains limited due to lack of registries as well as limited participation in the professional organizations in the Czech Republic.

Professional Organizations for Dietitians

Currently there are three professional organizations representing the dietitians in the Czech Republic, each differing in their genesis, membership, goals, and activities. The organisations are listed chronologically in the order they were established, with the membership of dietitians concentrated between two associations, SD CAN and CAD.

Section of Dietitians as a Part of the Czech Association of Nurses (SD CAN)/Sekce Nutričních Terapeutů České Asociace Sester (SNT ČAS)

Historically the oldest professional organization of dietitians is the Section of Dietitians, as a part of the Czech Association of Nurses (CAN), which was established in 1992.³⁹ This section brings together dietitians and dietetic assistants working in health and social care facilities, education, and counselling services, as well as students and retired members. The 2019 Annual report documents 190 members in SD CAN.⁴⁰ Their goals include strengthening the role of dietitians in support of the current legislation, increasing the salary of dietitians, providing easy availability of professional information, and improving awareness of SD CAN activities.³⁹

Section of Nutrition and Nutrition Care (SNNC)/Sekce Výživy a Nutriční Péče (SVNP)

The Section of Nutrition and Nutrition Care was established in 2016. It is a multi-professional organization that is open to nutrition experts (including dietitians), specialists in other disciplines and students. The Annual Report was not available for review, and there was no information about the number of members. Its goals are broad and include information about increasing the expertise of members, educational programs about health and nutrition for the population. To fulfil these goals, SNNC reports

organizing conferences, supporting cooperation with other organizations and publishing education materials.⁴¹

Czech Association of Dietitians (CAD)/Česká Asociace Nutričních Terapeutů (ČANT)

Founded in 2018, the Czech Association of Dietitians (CAD) is an independent organization with a membership that consists of dietitians and dietetic students (future dietitians). In 2019 CAD had 70 members and became an associate member of EFAD. Through the affiliation with EFAD, CAD brings Czech dietitians the opportunity for international collaboration with European dietitians. The aims of CAD include improving nutritional care in the Czech Republic through greater involvement of its members, creating opportunities for the application of their skills and knowledge, constantly increasing the expertise of its members, cooperation with other professionals and involvement in European and global professional structures.⁴² In 2020, the CAD has merged with the Association of Dietetic Students, creating a platform for the self-actualization of future dietitians.⁴³

Discussion

Despite the long history of nutrition care and the current training for dietitians, there can still be identified gaps in the system, including legislation, SOP, education, and nutrition care, which are challenging the advancement of the profession. University educated dietitians are trained to apply evidence-based knowledge about food and nutrition to assess,⁴⁴ counsel and educate patients about prevention, treatment and management of nutrition-related disorders, also known as Medical Nutrition Therapy (MNT).^{1,45} Current research documents the significant benefits of dietitians providing

MNT to improve health outcomes and reduce health care costs for various diseases including diabetes, cardiovascular disease, obesity and malnutrition.¹⁻³ Unfortunately, the SOP for dietitians in the CR is limited according to the current legislation as noted in Table 1, thus potentially missing opportunities to improve nutrition related care for patients as the prevalence of non-communicable diseases increases in the CR.⁵ Current research supports that nutrition care provided by qualified dietitians is cost-effective⁴⁶⁻⁴⁸ with evidence demonstrating that “every €1 spent on dietary counselling of patients with obesity or obesity-related diseases reduced health care related costs €14 to €63 over a period of 5 years.” Despite the benefits and cost savings documented in other health care systems,⁴⁹ research is needed to assess opportunities and promote adequate staffing in CR hospitals and clinics.

In addition, the current legislation creates an unnecessary burden on doctors in the Czech healthcare system to provide optimal nutrition care. Preliminary research from MU Medical School identifies that future doctors report a lack of nutrition education and limited awareness about the role of dietitians in the hospital setting.^{50,51} Dietitians are educated and trained about the use of MNT including therapeutic meals and supplements for the management, treatment, and prevention of various diseases. Thus, as is consistent with the practice in other countries, modifying the SOP for qualified dietitians to include ordering privileges for therapeutic diets and supplements will utilize their education and training and further support the role of doctors by allowing them to focus on other aspects of patient care and thus improving nutrition care in the CR.⁵² Furthermore, facilitating the reimbursement for nutrition services from insurance companies presents another

opportunity for improving patient access to qualified dietitians for MNT. By involving dietitians on the interdisciplinary healthcare team, there is an opportunity for improving nutrition care in the CR.⁵³ Additionally, by promoting participation in the professional organizations as well as networking and collaborations with dietitians and associations in other countries, there are many opportunities for dietitians as well as for the future nutrition professionals in the CR. Specifically through involvement with EFAD's student section, European Network of Dietetic Students (ENDietS),⁵⁴ future dietitians can raise awareness and connect with dietetic students from other European universities and high schools to spread awareness about the important work of dietitians and promote research to demonstrate the benefits of promoting optimal nutrition care.

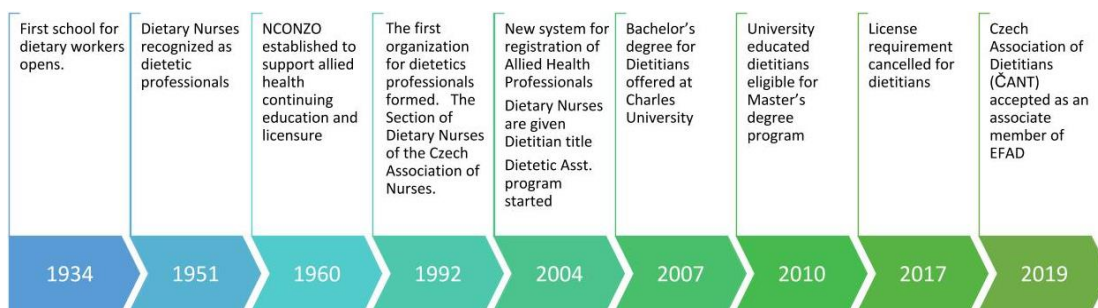


Figure 3. Key Milestones for Dietitians in the Czech Republic.

Implications

Overall, the profession is evolving as evidenced by the significant events associated with the development of the dietetics profession in the Czech Republic (see Figure 3). It is clear that the 50-year long tradition of dietary nurses as compared to the 16-year modern history of dietitians has had an impact on their current position and perception by the public and healthcare professionals. Despite gradual successes in this

profession, such as the growing number of dietitians (see Figure 2) and their increasing professional qualifications, there are still opportunities for improvement. To strengthen the position of dietitians among the allied health professions, it is necessary to document their important contributions with valid research conducted in the CR. These data can support efforts to initiate the necessary changes promoting dietitians as qualified health professionals and improve the quality of nutritional care provided in the Czech Republic.

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CHAPTER IV

**AN INTERNATIONAL COLLABORATION ASSESSING PERCEPTIONS
ABOUT NUTRITION EDUCATION AND THE ROLE OF DIETITIANS AT A
MEDICAL SCHOOL IN THE CZECH REPUBLIC**

Nutrition is recognized as an important part of a healthy lifestyle.¹⁻³ The World Health Organization estimates that an unhealthy diet is a risk factor for 70% of deaths world-wide related to chronic non-communicable diseases (NCDs).⁴ Globally the increasing rates of NCDs, the so-called “lifestyle diseases” that include obesity related complications such as type 2 diabetes and cardiovascular disease, have potentially devastating complications including poor health outcomes.^{2,5} There is abundant evidence demonstrating that good nutrition can promote a healthier population^{1,3} and plays an important role in prevention and treatment in healthcare.^{6,7} Thus, it is important to assess and share information about the nutrition education offered to future health professionals as well as to support the role of dietitians as the nutrition professionals in healthcare systems.⁸ While universities that educate healthcare professionals may support international collaboration between students and faculty^{9,10} even though their programs and emphasis on the role of nutrition in healthcare may not be the same. Thus, it is possible that their approach and motivation for collaborative relationships may be different making it difficult to develop productive collaborations. But diverse approaches to nutrition in both education systems and healthcare practice underscore the importance

of developing opportunities to promote global awareness for students and faculty.¹¹ This type of cooperation provides opportunities for students and faculty to conduct research, share information and resources, improve cultural awareness, and further contribute to the literature about the role of nutrition in education and medical care. Thus, it is unfortunate that the actual process of international collaboration in nutrition research is not widely documented. This article describes a collaborative effort to assess perceptions about the role of nutrition education in medical school and the role of dietitians, that was established between researchers at the University of North Carolina at Greensboro (UNCG) in the United States (US), and Masaryk University (MU) in Brno, Czech Republic.

Establishing an International Collaboration

While there can be many reasons for pursuing an international collaboration, after many years of clinical nutrition practice in the US this researcher desired to better understand the role of nutrition and dietitians in a different country and to gain an increased awareness of the importance of nutrition in medical education and healthcare. But establishing an international research collaboration can be challenging. It is a dynamic process that involves perseverance, patience, and a willingness to exchange information and resources all the way through. After an unexpected move from the US to Brno, Czech Republic (CR), the UNCG researcher, who is a registered dietitian, aimed to identify possible opportunities for a professional collaboration to conduct a research project. Initially the process started with the researcher making a series of contacts using

email, telephone and in-person meetings to identify and establish connections. This occurred over several months and took place in the US and CR as shown in Figure 4.

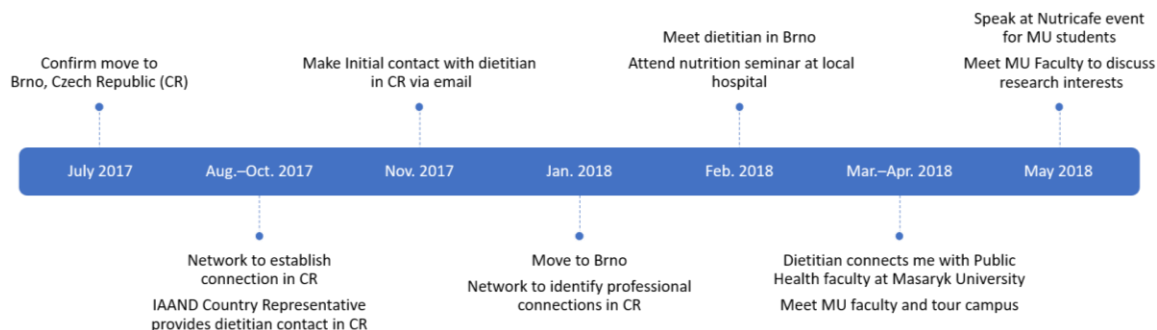


Figure 4. Timeline of Initial Networking Contacts.

Through a connection with the International Affiliate of the Academy of Nutrition and Dietetics (IAAND), the process yielded one English speaking professional contact in Brno and the researcher developed this relationship through electronic communication, in-person meetings and a willingness to provide technical assistance. By developing rapport while communicating professional interests and experience, this contact led to others as the work to establish a collaborative research project continued. Following this process over several months, the researcher connected with students and faculty members from the Faculty of Public Health at Masaryk University in Brno. Mutual interests and a desire to collaborate were identified after several in-person meetings, and a research topic was confirmed following discussions and review of the Czech and English literature. Figure 5 highlights several key milestones accomplished to realize the collaborative project between researchers at MU and UNCG.



Figure 5. Timeline of Key Milestones to Establish a Collaborative Project.

The process of identifying interests and establishing an opportunity for collaboration is complex, with each connection contributing to the process. In this case, the process took more than one year, and Figure 6 identifies the key contacts made to establish a connection between the researcher and the faculty collaborator at MU.

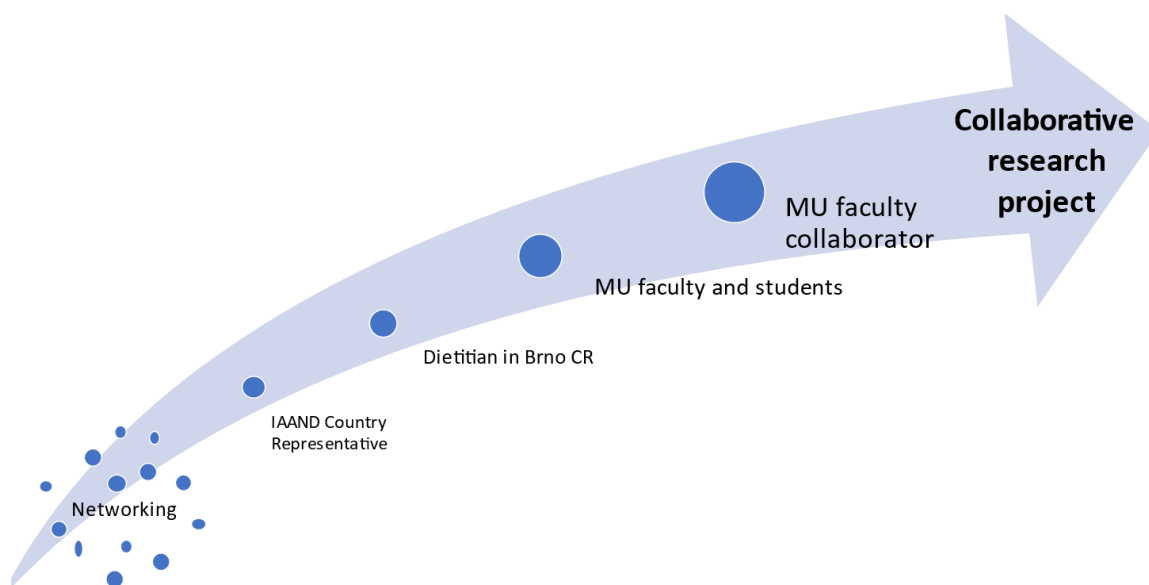


Figure 6. Key Contacts Established Leading to a Collaborative Research Project.

A few key aspects to this collaboration included conducting business in English and promoting clear communication through meeting agendas and summary notes that

documented main ideas expressed during each meeting, along with detailed follow up tasks and deadlines. Completing most tasks on time thus built trust and respect. Each collaborator made contributions using their native language and assigned tasks accordingly. In addition, we were aware of the goals for each institution through our collaboration and each researcher maintained close contact with their respective university and confirmed support from staff throughout the process. In-person meetings developed rapport and enabled the UNCG researcher to learn as much as possible about the situation locally and the professional terms related to the topic. Furthermore, years of experience working in clinical nutrition enabled the researcher to offer technical assistance to the MU faculty as well as preparing her to offer nutrition education lectures to MU students in the coming months. Overall, there were many factors that contributed to developing a successful collaboration.

Research Context

There is abundant evidence demonstrating that good nutrition can promote a healthier population¹² and plays an important role in healthcare.² Thus it is surprising that many medical schools around the world lack adequate nutrition training for medical students.¹³⁻¹⁵ Although there are ongoing efforts to improve nutrition education in European medical schools,¹⁶ not all countries in Europe are represented in the literature. The role or involvement of medical schools in the Czech Republic is not clear as they are not represented in the published research on this topic.^{13,15} With rising rates of obesity and nutrition related chronic diseases¹⁷ along with more than half of the elderly population at risk of malnutrition,¹⁸ this represents a growing concern for the health of

the population of the Czech Republic. This was further supported by my colleagues view that dietitians were not recognized as the nutrition experts and thus an underutilized member of the health care system (see Chapter III). Thus, with no published information on this topic and in support of the national strategy to improve the nutrition education for health professionals¹⁹ we identified a need for more information and research. Thus, with a medical school that offers programs in English and Czech combined with the recent changes to the education system for dietitians, we recognized that it was important to assess the situation here. With interest and support from my colleague at MU, we identified an opportunity for collaboration. This was of interest to my research colleague for many reasons including her desire to conduct research in the CR to further support nutrition education for medical students and establish better collaboration between doctors and dietitians in the clinical setting. In addition, as the first international collaboration in her department, she was eager to participate in order to learn more about dietetics practice in the USA with a long-term goal of improving the status of dietitians in the CR.

After several months of discussion and planning with faculty at MU and UNCG, we proposed the research project titled Nutrition from Theory to Practice: Perceptions of Nutrition Education for Medical Students in the Czech Republic. The project was approved and funded as part of an overall research proposal at MU titled: Deepening of knowledge in the field of health risks and benefits of nutrition, environment, and lifestyle. This research was planned and managed in collaboration with the faculty and students from the MU Department of Public Health. The project identified perceptions of medical

students and faculty about the role of nutrition in medical care and the role of dietitians with a long-term goal to provide recommendations to improve nutrition care for patients in CR.

To better identify and describe perceptions about the nutrition education offered in medical school in the Czech Republic we conducted a qualitative, cross sectional study using semi-structured interviews with medical students and faculty at Masaryk University medical school in Brno CR. Although research on this topic has been conducted globally, to our knowledge no data of this type has been gathered at medical schools in the Czech Republic, thus a grounded theory approach was used to explore the experiences of medical students and faculty at MU. We conducted individual interviews using open-ended questions and probes to gather information, improve understanding, and identify barriers to nutrition education in medical school. Inductive coding and thematic analysis were used to identify patterns from within the qualitative data gathered at the interviews.

MU provides a unique environment for exploring this issue because the medical school offers parallel study programs using the same curriculum in two languages, Czech and English. Thus, the school is not only educating students from the Czech Republic and Slovakia, but also from countries in Europe and around the world providing an opportunity to gather a wide variety of perspectives about nutrition education in medical school. Interviews were conducted with students in the Czech and English programs as well as faculty members that teach students in one or both programs.

This study aimed to answer the question about perceptions of the role of dietitians from students and faculty in MU medical school. The focus of this project was the direct

result of communication with dietitians, students, and faculty during the networking and planning process. These interactions identified that even though MU offers dietitians a university-based education based on global standards,²⁰ their qualifications can be misunderstood because they are identified by the same title as those with less education and training and are consequently underutilized as the nutrition expert on a healthcare team. There was limited information published about the history of dietetics and nutrition care in CR. Therefore, in addition to the main research project, a secondary aim was to research the history of dietetics practice and education in the Czech Republic. As a result, a narrative review to summarize the history and future opportunities for dietitians in the CR was written by the team (see Chapter III).

Study Team

The research team consisted of three dietitians. One PhD bi-lingual (Czech and English) faculty at MU (ZK), one PhD Candidate from UNCG (VH) (English only) and a MU Master's degree student (VS) that is bi-lingual (Czech and English).

Recruitment

A convenience sample of MU medical school students and faculty volunteers was recruited using a variety of methods including printed flyers posted at locations throughout the MU medical school campus, e-mail announcements sent to students and faculty, and by study staff making in person visits to medical school classes to describe and promote the research. In addition, as the study progressed, snowball sampling was used with study staff asking participants to provide contact information or give study flyers to other students or faculty that may be interested in participating (see Appendices

C, D, and E). Each method used for recruitment clearly stated the purpose of the research: to assess student and faculty perceptions of nutrition education at MU medical school. All students and faculty of the medical school were invited to volunteer for an individual interview with research staff and a voucher for a one-hour session with a dietitian was offered as an incentive to participate. As the first study of this kind in CR, we aimed to collect a broad sample of viewpoints from throughout the medical school program and thus intentionally recruited students from all grades in the English and Czech programs and faculty from one or both programs.

Data Collection

Thematic interview guides were collaboratively developed in English by study staff to collect demographic information and to explore the perceptions of study aims related to the role of nutrition in medical care, nutrition education in medical school and the role of dietitians (see Appendix B). Three different interview guides were developed for: students, faculty physicians and faculty non-physicians. The open-ended questions were modified based on a student's grade in medical school and differences in the clinical experience of the faculty. The interview guides were reviewed by faculty at MU and UNCG, translated into Czech, and then both the English and Czech versions were face validated with our target population, MU medical students and faculty members.

During the interview, participants were asked to provide demographic information (see Appendix B) and invited to discuss other topics they considered relevant. Interviews were conducted in Czech and in English by a primary researcher in their native language (ZK in Czech and VH in English). Both primary researchers are dietitians and have

experience conducting in-person interviews. In addition to the participant and the interviewer, most interviews were attended by the other primary researcher and the study research assistant (VS) who prepared written interview notes in English (see Appendix F). The 12-75-minute conversations were audio recorded, transcribed verbatim and anonymized following a protocol, except for one file that was lost due to technical difficulties where we used interview notes instead (see Appendix G). The Czech transcripts were translated into English by a bi-lingual translator that was not involved in other aspects of the study and each translation was reviewed by both primary researchers for accuracy and readability. Member checks were completed for several interviews, two in Czech and two in English.

The study data in both English and Czech, and required transcription and translation before analysis by both researchers. Thus, it was not possible or practical to assess saturation as data was collected.²¹ We collected data to include participants from all grades in both programs, as well as faculty medical doctors (MD) and non-MDs from various departments. Data saturation was inferred based on a preliminary analysis of 10 interviews at a mid-point in the study as the themes identified were similar to our final themes (see Appendix K).

Data Analysis

All transcripts were reviewed and coded in two passes^{21,22} according to a protocol developed by the research team (see Appendix H). The first pass was conducted collaboratively with both primary researchers independently reviewing each transcript in their native language (English or Czech), identifying emergent themes and inductive

codes, and then comparing results to develop a final code book in English containing both inductive and deductive codes (see Appendix I). The second pass was conducted independently by the English researcher (VH), and all transcripts were coded in English using Atlas.ti version 9, qualitative data analysis software. Subsequent data analysis was conducted by VH using thematic analysis.

Ethical Considerations

This study was approved by the institutional review board of the University of North Carolina at Greensboro (approval number: 19-0379) and the Ethics Committee of the Faculty of Medicine at Masaryk University (approval number: 3/2019) After describing the purpose of the research, a written informed consent was obtained from each participant to record, transcribe, and analyze the interview and to present the de-identified results.

Results

The international collaboration between dietitian researchers from MU and UNCG resulted in the successful completion of a research project. Thirty-six participants completed interviews with the research team during the study period from April 2019 to February 2020, 30 medical students and six members of the medical school faculty. The students were equally divided between the Czech and English programs, with an age range of 19-35 years and over half (57%/17) in the clinical phase of their medical education (grades 3-6) (see Table 2).

Table 2

Demographics of Medical Student Participants

Characteristic	Number	Percent
MEDICAL STUDENTS (n=30)		
Medical School Program		
Czech language	15	50%
English language	15	50%
Gender		
Female	14	47%
Male	16	53%
Nationality		
Czech/Slovak	15	50%
Other	15	50%
Grade in medical school at time of interview		
Grade 1 (Czech n=4, English n=3)	7	23%
Grade 2 (Czech n=2, English n=4)	6	20%
Grade 3 (Czech n=2, English n=3)	5	17%
Grade 4 (Czech n=3, English n=1)	4	13%
Grade 5 (Czech n=0, English n=2)	2	7%
Grade 6 (Czech n=4, English n=2)	6	20%

Most of the faculty participants were clinicians ($n=5$; 83%), with $n=3$ medical doctors and $n=2$ health professionals (nurse and dietitian) (see Table 3). Overall, the faculty participants represented a variety of disciplines including internal medicine, pediatrics, oncology, nursing, biochemistry, and public health.

Table 3

Demographics of Medical School Faculty Participants

Characteristic	Number	Percent
MEDICAL SCHOOL FACULTY (n=6)		
Medical school program faculty		
Czech and English language programs	4	67%
Czech language only	2	33%
English language only	0	0%
Gender		
Female	4	67%
Male	2	33%
Nationality		
Czech/Slovak	5	83%
Other	1	17%
Clinical training and practice		
Medical doctor	3	50%
Other health professional	2	33%
No clinical experience	1	17%

Through thematic analysis^{21,23} four main themes were identified from the data related to medical student and faculty perceptions about nutrition education in medical school and the role of dietitians in medical care and education (see Table 4 and Appendices H and J).

Table 4

Main Themes and Subthemes Identified from Data Analysis

Theme	Sub-theme
Nutrition in medical care and health	<ul style="list-style-type: none"> • Importance of nutrition • Doctor's role in providing nutrition care
Nutrition education in the current curriculum	<ul style="list-style-type: none"> • General education focusing on theoretical information • Limited emphasis on nutrition topics • Preparation for clinical practice
Role of dietitians in medical care and education	<ul style="list-style-type: none"> • Limited awareness and interaction in the clinical setting • Role on the medical school faculty • Importance of Interdisciplinary care
Opportunities for nutrition education in medical school	<ul style="list-style-type: none"> • Student interest in personal nutrition for self-care • Interest in more practical education and training

These themes are consistent with those identified in a preliminary analysis of 10 participant interviews completed in the fall of 2019,²⁴ (see Appendix K) thus supporting theme saturation. A full review of the results is included in Chapter V.

Discussion

Although results for the main themes and sub-themes identified in the analysis are included in Chapter V, it is notable that while our participants supported the importance of nutrition in medical care, prevention, and health, many had limited knowledge about the role and/or experience working with a dietitian; thus, potentially limiting the opportunity for interdisciplinary care with dietitians as well as making referrals for patients that may benefit from nutrition related care. The students desired more practical

nutrition education at medical school and supported the involvement of dietitians on the medical school faculty, recognizing the opportunity to provide practical, nutrition education. Therefore, with faculty dietitians and a university program to educate and train dietitians at MU, these results identified possible opportunities for supporting the involvement and increasing awareness of dietitian's role while providing nutrition education to medical students. The project identified meaningful perceptions and demonstrated the benefits of international collaboration.

This project was completed through a successful collaboration between researchers at MU and UNCG. Several factors contributed to the success including finding an area of interest to both collaborators and universities.¹¹ In this case we worked to connect and establish our project as part of a larger grant at MU, thus garnering department and university level support along with funding to complete the work.²⁵ In addition, the project included a topic that was relevant to both researcher's professional experience and interests as dietitians. This supported direct involvement in professional conferences with our peers to share our experience and results to promote awareness and further recognition about the role of dietitians as nutrition professionals in CR. Furthermore, because the researchers are native speakers in 2 different languages (Czech and English), it enabled productive interviews with students and faculty in both medical school programs, thus supporting a broad sample of participants for the study. This is critically important when conducting a qualitative study to gain perceptions from the varied population of students that are represented in the medical school. Additionally, the researchers had access to resources and faculty from both universities which provided

additional support for the research project.²⁵ Finally, as the topic of assessing perceptions about the role of dietitians to improve nutrition care for patients is a concern in the EU, US and around the world, it provides opportunities to share this work within CR and beyond.¹¹ In addition to the development of this project, an important benefit was the opportunity to identify and engage in other work with collaborators including teaching a lesson for the MU graduate students about nutrition communication, connecting with faculty at UNCG to plan for students from MU and UNCG to connect through a joint classroom learning experience, and assisting MU nutrition students with research or thesis projects.¹¹ Overall, the experience of collaboration was both enriching and productive, but as an international project we experienced some challenges as well.

Finding a common language for the work was essential and in this case we used English. We relied on translation services for half of our interviews and learned the importance of identifying a translator that was a native English speaker.^{26,27} This proved to be a challenge initially until we secured the services of an experienced translator that was not only a bi-lingual speaker and writer, but also had limited awareness and involvement in the research thus minimizing possible bias when preparing the English translations of the Czech interview transcripts. Additionally, with half of our interviews in Czech, the process took time and occurred over several months following the transcription of the interviews, requiring patience as we prepared to conduct our final data analysis. Despite the important benefits and achievements in international collaboration, the process requires a mutually beneficial goal, adequate resources, strong communication, patience, and determination from start to finish.¹¹

Implications

While the strategic initiatives of MU¹⁰ and UNCG⁹ support the role of international research collaborations, there is limited literature that discusses the process of developing a professional collaboration as a method in nutrition research. As demonstrated in this research project, a successful international collaboration involves forming a partnership with mutual research interests and goals, communicating effectively in the chosen language, gaining institutional support, and demonstrating patience and persistence through the planning and execution of the project. This project identified some benefits and challenges in the process and employed several factors important for developing and executing a successful international collaboration. The project results contribute findings from the CR to the international literature and has identified opportunities for increasing recognition for the role of dietitians, improving the nutrition education for future doctors, and thus improving the nutrition care for patients in the Czech Republic.

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CHAPTER V

**NUTRITION FROM THEORY TO PRACTICE: PERCEPTIONS ABOUT THE
ROLE OF NUTRITION EDUCATION AT A MEDICAL SCHOOL IN THE
CZECH REPUBLIC**

Introduction

Nutrition impacts everyone from birth through death playing a vital role in the prevention, treatment and management of disease that contributes to poor health outcomes around the world.¹ Over the past century essential nutrient deficiencies have decreased and rates of infectious diseases have dropped, but the rates of chronic diseases have risen likely due to changes in lifestyle behaviors including dietary choices.² The World Health Organization (WHO) estimates that 70% of deaths world-wide are related to chronic disease with modifiable risk factors including an unhealthy diet.³ Evidence-based research supports the benefits of nutrition therapy which includes assessment and education for numerous health outcomes^{2,4} including reducing length of hospital stays due to malnutrition,⁵ improving blood pressure to reduce risk of mortality,⁶ promoting weight loss to reduce obesity,⁷ and the prevention of diabetes⁸ and cardiovascular disease.⁹ Physicians provide medical care and patients see them as a trusted source of health information,¹⁰⁻¹² yet many physicians feel unable to adequately counsel patients about common nutritional treatment options.¹³⁻¹⁵ Therefore, considering the efficacy of nutrition therapy for improving health outcomes,^{2,4,16} it is essential that medical schools

offer students adequate education and training in nutrition to prepare them to identify nutrition-related issues, educate and counsel patients, and offer sufficient information to future doctors about the role of trained nutrition professionals and dietitians, to promote consultation and patient referrals when indicated. Dietitians are health professionals that have completed specialized education and supervised clinical practice in nutrition and dietetics and are qualified to provide evidence-based care for nutrition related conditions.¹⁶⁻¹⁹ Unfortunately despite abundant evidence demonstrating the beneficial role of nutrition and dietetic interventions in the prevention, treatment and management of many health conditions,^{2,16,18,20} research identifies that many medical schools in Europe and around the world lack the recommended amounts of nutrition education for medical students²¹⁻²³ which likely contributes to physicians reporting a lack of knowledge and time to provide patients with nutrition advice.^{13,16,24} Until recently the Czech Republic (CR) was not represented in any research on this topic, but a 2019 assessment of the online curriculum at Masaryk University (MU) medical school estimates that students are getting fewer hours of nutrition education than is recommended, 19.5 vs 25 hours.²⁵ With rising rates of obesity and nutrition related chronic diseases^{26,27} along with more than half of the elderly population at risk of malnutrition,²⁸ this represents a growing concern for the health of the population of the Czech Republic.

The increasing prevalence of non-communicable diseases (NCDs) in CR²⁷ and a lack of nutrition education for students at MU medical school²⁵ combined with the possible misunderstanding about the role of university educated dietitians in healthcare

(see Chapter III) may result in missed opportunities for nutrition assessment and education for patients. This may negatively impact health outcomes for patients with NCDs and other nutrition related conditions. Although global research documents that medical students report nutrition education is lacking and many desire additional education and training in related skills,²⁹⁻³¹ it is unclear if this describes the situation at medical schools in the Czech Republic. Relevant context is essential, with many studies conducted at single sites that have different medical education systems, thus the results may not be generalizable to CR or elsewhere. In addition, as the Czech Republic emerges from the post-communist era, with a medical school that offers programs in English and Czech combined with the recent changes to the education system for dietitians, it is important to assess the situation here.

The current project is part of an overall research proposal at MU titled: Deepening of knowledge in the field of health risks and benefits of nutrition, environment, and lifestyle. It was conducted as part of the sub-research project, Nutrition from Theory to Practice, which has separate programs designed to assess not only the perceptions of faculty and students about nutrition education but also the MU medical school curriculum,²⁵ the nutrition knowledge of medical students and to evaluate the quality of the nutrition care system in the Czech Republic. The long-term goal of this project is to improve the health care for the population of the CR.

Methods

To better identify and describe perceptions about the nutrition education offered in medical school in the Czech Republic we conducted a qualitative, cross sectional study

using semi-structured interviews with medical students and faculty at Masaryk University medical school in Brno CR. Although research on this topic has been conducted globally, to our knowledge no data of this type has been gathered at medical schools in the Czech Republic, thus a grounded theory approach was used to explore the experiences of medical students and faculty at MU. We conducted individual interviews using open-ended questions and probes to gather information, improve understanding, and identify barriers. Inductive coding and thematic analysis were used to identify patterns from within the qualitative data gathered at the interviews.

Research Context

MU provides a unique environment for exploring this issue because the medical school offers parallel study programs using the same curriculum in two languages,²⁵ Czech and English. Thus, the school is not only educating students from the Czech Republic and Slovakia, but also from countries in Europe and around the world and provides an opportunity to gather a wide variety of perspectives about nutrition education in medical school. We interviewed students from all grades (1st through 6th) in the Czech and English programs as well as faculty members that teach students in one or both programs.

Recruitment

We purposely recruited a convenience sample of MU medical school students and faculty volunteers using a variety of methods including printed flyers posted at locations throughout the MU medical school campus, e-mail announcements sent to students and faculty, and by study staff making in person visits to medical school classes to describe

and promote the research (see Appendices C, D, and E). In addition, as the study progressed, we used snowball sampling with study staff asking participants to provide contact information or give study flyers to other students or faculty that may be interested in participating. Each method used for recruitment clearly stated the purpose of the research: to assess student and faculty perceptions of nutrition education at MU medical school. All students and faculty of the medical school were invited to volunteer for an individual interview with research staff and a voucher for a one-hour session with a dietitian was offered as an incentive to participate. As the first study of this kind in CR, we aimed to collect a broad sample of viewpoints from throughout the medical school program and thus intentionally recruited students from all grades in both programs. Therefore, with medical students in six grades and 2 programs we aimed to recruit more student than faculty participants.

Data Collection

Thematic interview guides were developed in English by study staff to collect demographic information and to explore the perceptions of study themes related to the role of nutrition in medical care, nutrition education in medical school and the role of dietitians (see Appendix B). The demographic information collected varied between students and faculty but included nationality, gender, age, and primary language spoken as well as specific information for the faculty regarding clinical practice and experience on the faculty. Three different interview guides were developed for: students, faculty physicians and faculty non-physicians. The open-ended questions were modified based on a student's grade in medical school and differences in the clinical experience of the

faculty. The interview guides were reviewed by faculty at MU and UNCG, translated into Czech, and then both the English and Czech versions were face validated with MU medical students and faculty members.

Participants were asked to provide demographic information and invited to discuss other topics they considered relevant. Interviews were conducted in Czech and in English by a primary researcher in their native language (ZK in Czech and VH in English). Both primary researchers are dietitians and have experience conducting in-person interviews in clinical settings in their home countries (ZK in CR and VH in the United States). In addition to the participant and the interviewer, most interviews were attended by the other primary researcher and the study research assistant (VS) who prepared written interview notes (see Appendix F). The 12-75-minute conversations were audio recorded, transcribed verbatim and anonymized, except for one file that was lost due to technical difficulties where we used interview notes instead (see Appendix G). The Czech transcripts were translated into English by a bi-lingual translator that was not involved in the study data collection, and each translation was reviewed by both primary researchers for accuracy and readability. Member checks were completed for several interviews, two in Czech and two in English.

Data Analysis

All transcripts were reviewed and coded in two passes (see Appendix H).^{32,33} The first pass was conducted collaboratively with both primary researchers independently reviewing each transcript, identifying emergent themes and inductive codes, and then comparing results to develop a final code book in English containing both inductive and

deductive codes (see Appendix I). The second pass was conducted independently by the English researcher (VH), and the English transcripts were coded using Atlas.ti version 9, qualitative data analysis software. Subsequent data analysis was conducted collaboratively using thematic analysis.^{32,34} As dietitians we aimed to limit our bias in the data analysis and inductively developed codes to characterize the information expressed by participants. When completing the transcript coding and subsequent data analysis, we coded all viewpoints expressed by participants and following transcript coding, and conducted a careful review of the transcripts to confirm that all information was included and coded based on information in the code book. During data analysis and theme development, we considered all responses for the related codes to represent the viewpoints of our participants.

Ethical Considerations

This study was approved by the institutional review board of the University of North Carolina at Greensboro (approval number: 19-0379) and the Ethics Committee of the Faculty of Medicine at Masaryk University (approval number: 3/2019). After describing the purpose of the research, a written informed consent was obtained from each participant to record, transcribe, and analyze the interview and to present the de-identified results (see Appendix A).

Results

Thirty-six participants completed interviews with the research team during the study period from April 2019 to February 2020, 30 medical students and six members of the medical school faculty. The students were equally divided between the Czech (CZ)

and English (EN) programs, with an age range of 19-35 years and over half (57%/17) in the clinical phase of their medical education (Grades 3-6) (see Table 5).

Table 5

Demographics of Medical Student Participants

Characteristic	Number	Percent
MEDICAL STUDENTS (<i>n</i>=30)		
Medical School Program		
Czech language	15	50%
English language	15	50%
Gender		
Female	14	47%
Male	16	53%
Nationality		
Czech/Slovak	15	50%
Other	15	50%
Grade in medical school at time of interview		
Grade 1 (Czech <i>n</i> =4, English <i>n</i> =3)	7	23%
Grade 2 (Czech <i>n</i> =2, English <i>n</i> =4)	6	20%
Grade 3 (Czech <i>n</i> =2, English <i>n</i> =3)	5	17%
Grade 4 (Czech <i>n</i> =3, English <i>n</i> =1)	4	13%
Grade 5 (Czech <i>n</i> =0, English <i>n</i> =2)	2	7%
Grade 6 (Czech <i>n</i> =4, English <i>n</i> =2)	6	20%

Most of the faculty participants were clinicians (*n*=5; 83%), with *n*=3 medical doctors and *n*=2 health professionals (nurse and dietitian), while 1 had no clinical experience (see Table 6). Overall, the faculty participants represented a variety of

disciplines including internal medicine, pediatrics, oncology, nursing, biochemistry, and public health.

Table 6

Demographics of Medical School Faculty Participants

Characteristic	Number	Percent
MEDICAL SCHOOL FACULTY (n=6)		
Medical school program faculty		
Czech and English language programs	4	67%
Czech language only	2	33%
English language only	0	0%
Gender		
Female	4	67%
Male	2	33%
Nationality		
Czech/Slovak	5	83%
Other	1	17%
Clinical training and practice		
Medical doctor	3	50%
Other health professional	2	33%
No clinical experience	1	17%

Through thematic analysis^{32,34} four main themes were identified from the data related to medical student and faculty perceptions about nutrition education in medical school and the role of dietitians in medical care and education (see Table 7 and Appendix J).

Table 7

Main Themes and Sub-themes Identified from Data Analysis

Theme	Subtheme
Nutrition in medical care and health	<ul style="list-style-type: none"> • Importance of nutrition • Doctor's role in providing nutrition care
Nutrition education in the current curriculum	<ul style="list-style-type: none"> • General education focusing on theoretical information • Limited emphasis on nutrition topics • Preparation for clinical practice
Role of dietitians in medical care and education	<ul style="list-style-type: none"> • Limited awareness and interaction in the clinical setting • Role on the medical school faculty • Importance of interdisciplinary care
Opportunities for nutrition education in medical school	<ul style="list-style-type: none"> • Student interest in personal nutrition for self-care • Interest in more practical education and training

Theme 1. Nutrition in Medical Care and Health***Subtheme 1. Importance of Nutrition***

Overall, students and faculty emphasized and affirmed the important and wide-ranging role that nutrition plays in medical care and health, describing it as significant and essential for both prevention and treatment. They acknowledged the critical relationship between nutrition and medicine, recognizing its role in many diseases and impact on health outcomes. While the participants identified that nutrition knowledge and education are especially important for certain population groups including children, pregnant women, parents, and the elderly, they generally supported that nutrition knowledge is important for everyone to care for themselves and their family.

Additionally, the medical students identified that access to practical nutrition education and knowledge early in their training (Grades 1 or 2) is important for their own self-care during medical school.

. . . everybody should be informed [about nutrition]. (Grade 4, EN program)

a behavior you start in childhood tends to stick with you in adolescence and then into adulthood as well. (Grade 6, EN program)

. . . without the proper diet you cannot have proper medicine. (Grade 3, EN program)

. . . significant. It is actually one of the most important parts . . . Whether in prevention or in primary care, it is actually a big part of what the patient can do for himself. (Grade 6, CZ program)

When patients are not nourished completely, the patients have the tendency to develop more of an infection and later on they do not heal properly. (Faculty)

Nutrition plays a major role in treating a patient. (Faculty)

So regardless if you are an oncologist or infectious disease [doctor], you should know about nutrition. It is a key to every medical specialty. (Grade 3, EN program)

To have the basics . . . from the first year. It is important to apply to ourselves. (Grade 2, CZ program)

Subtheme 2. Doctor's Role in Providing Nutrition Care

When asked about the role of doctors in providing nutrition care, most students and faculty members agreed that doctors should promote good nutrition and be educated to offer general nutrition information to patients. While some recognized that patients view the doctor as a role model and stressed that doctors should not offer incorrect or

inconsistent advice regarding nutrition topics, there was varied support by doctors for cooperation with dietitians.

Every internal medicine doctor should know how to give [nutrition] advice.
(Grade 6, CZ program)

[Doctors should] lead by example. Often nutrition is neglected because the doctor doesn't emphasize it, even for themselves. They don't consider it to be important.
(Faculty)

The doctor should indicate what is the proper diet and then the expert should come. But if the doctor does not find it important, so then we won't refer to an expert. (Grade 6, CZ program)

Doctors should definitely have information about proper nutrition, and if they do not feel competent to give the patient that kind of advice, they should contact the dietitian. (Grade 4, CZ Program)

Facing barriers such as limited time during patient visits, inadequate nutrition knowledge and varied emphasis on nutrition, participants expressed concerns about doctors having sole responsibility for offering nutrition education and advice.

They [doctors] have [many] other things to worry about, that I think that it would, it might be too much of a load to put on the doctors . . . that they should be the only ones providing nutritional information. (Grade 4 EN program)

Not all doctors are adequately educated in that [nutrition], and not all of them are able to provide their patients with nutritional information that meets all the criteria and trends and changes that are taking place in nutrition. (Faculty)

Theme 2. Nutrition Education in the Current Curriculum

Subtheme 1. General Education Focusing on Theoretical Information

Some participants shared that the medical school offers a good theoretical education while providing students with general information about nutrition. Although a

few students supported the amount of nutrition education noting that most doctors will not be the only source of nutrition information, but many other faculty and students expressed frustration. When describing the amount of nutrition in the current curriculum these participants described it as “inadequate” and “not enough.” They asked for more nutrition education to be added to the curriculum stating the basic information included is insufficient for today’s medical care. In addition to the curriculum, some participants expressed frustration with the way the information is presented, noting MU offers a more passive system of education and not interactive learning.

[The] theory at this school is very good, but it's not as good in practice.
(Grade 3 EN program)

[Nutrition education is] quite good in this faculty here within first two years. But the practical consequences of nutrition in disease . . . this is missing in last years of curriculum. (Faculty)

. . . we do get the theoretical basis of how nutrition can affect a condition . . . [but] we don't see the application of this knowledge in practice. (Grade 6 EN Program)

The school does not prepare us for the practical problems at all. We have some theoretical background [about nutrition] but practically [in reality] we know nothing. (Grade 6, CZ program)

. . . they should teach us more about nutrition and give us more insight into this issue. And not only on the theoretical level . . . I think that nutrition should be [offered] at the expense of some theoretical knowledge. (Grade 3, CZ program)

[Our classes are] mostly lecture, people don't ask questions. (Grade 4, CZ program)

Subtheme 2. Limited Emphasis on Nutrition Topics

When asked about the emphasis on nutrition topics, despite importance to all areas of medical care, some students reported that the faculty emphasize it only in certain

subjects including pediatrics, oncology, biochemistry, and public health. Students report that it is treated like a secondary subject that is only briefly discussed, not a priority and more importantly not emphasized on tests, which may discourage students from studying this information. Students report that not seeing nutrition in clinical practice discourages learning nutrition in medical school. Faculty identified possible barriers to learning nutrition and including nutrition education in the curriculum, including a lack of time that is complicated by the continued advancement and discovery of knowledge in the nutrition field, the pervasive attitude that the importance of nutrition is underestimated, and not updating lectures to include new or changing information related to nutrition topics.

[The] enthusiasm is for other subjects, nutrition is not a priority in any subject. (Grade 6, CZ Program)

Nutrition topics are not emphasized on exams. There are not many questions about nutrition on the tests we passed. It is taught but not tested. (Grade 5, EN program)

. . . they talk about those eradicated diseases all the time, we just keep cramming for tests about them but then we keep eating hot dogs all the time. (Grade 4, CZ program)

The importance of nutrition is underestimated . . . There are a lot of other topics and there is not enough time to introduce more nutrition topics. (Faculty)

Subtheme 3. Preparation for Clinical Practice

Participants report that the school's lack of emphasis on nutrition is continued through to clinical training, despite some theoretical knowledge the demonstration of nutrition in clinical practice is missing. Students at different levels of education confirm that while the importance of nutrition may be discussed, their education was inadequate

and they lack confidence offering patient care, noting insufficient knowledge in areas such as disease management and patient education. They report that nutrition interventions are not emphasized or applied like other clinical treatments such as pharmacology and physical therapy, with one faculty doctor explaining that while it is important, addressing nutrition is perceived to be more complicated and require a lot of time. The faculty shared concerns about the limited emphasis on nutrition in the clinical education for future doctors including the lack of adequate training in the hospital diet system.

I don't feel competent to give them (nutrition) advice confidently . . . we don't have enough knowledge about nutrition to pass it on to patients. (Grade 4, CZ program)

No, they [students] don't have sufficient training. They have just some imagination . . . that nutrition should be solved but don't know exactly [how to do it]. (Faculty)

I wouldn't dare advise anyone on [nutrition]. (Grade 6, CZ program)

. . . that's the step that's missing in our education. Because as a doctor you need to recommend to the patient like this is what you should eat and not eat. This I think we didn't learn as well. (Grade 6, EN program)

. . . we certainly did somehow deal with patient's [treatment regarding] pharmacology, surgically and some rehabilitation, but I do not remember that we discussed nutrition treatment for a patient. . . . they didn't present any more concrete examples or actually [show] how to apply it. (Grade 6, CZ program)

And I think that this is a great problem here in Czech Republic that nutrition is not viewed as a proactive activity that helps to reach better outcomes of the main treatment, and taking care of nutrition . . . requires a lot of time. (Faculty)

I have not seen any emphasis given by the doctor to the patient [about] nutrition. (Grade 6, EN program)

Theme 3. Role of Dietitians in Medical Care and Education

Subtheme 1. Limited Awareness and Interaction in the Clinical Setting

There were varying responses about the role of dietitians, with some students reporting little to no knowledge about the work of dietitians, including a few students in the clinical years of school stating that they have never seen a dietitian in the hospital during their clinical experience. Other students and faculty expressed awareness and support for the beneficial, important, and significant role of nutrition and dietitians in medical care, indicating they have more expertise in nutrition than doctors. One grade 6 student notes he has not met any dietitians during his medical school education but follows them on Instagram. Their role in food service, meal planning and patient education was identified and commended. Faculty clinicians expressed support for their role in medical care with some sharing frustration that despite their education and expertise in nutrition, dietitians are not well respected and not treated as part of the healthcare team in the Czech health system.

I do not know exactly how the dietitian works. (Grade 6, CZ program)

They're in hospitals, aren't they? But I haven't actually seen any [dietitians] at work. (Grade 4, CZ program)

We haven't had any interactions with them, [dietitians], on a clinical basis. (Grade 4, EN program)

If you have hypertension, maybe if you have diabetes . . . then your nutrition is your medicine. For these cases, I think the dietitian is more important than the doctor. (Grade 5, EN program)

I have had no interaction with a dietitian who graduated from school, but I follow instagram accounts of dietitians and there I learn other things [about nutrition]. (Grade 6, CZ program)

I think a higher number of them in hospitals would be beneficial because to tell the truth about food, both in everyday life and in different diseases. But I haven't experienced that anywhere, a dietitian being systematically used in hospital wards. (Grade 6, CZ program)

[Doctors] look down on them . . . You see first of all here in Czech Republic we have to eliminate that conception, [because] the dietitian [and] the nurse are part of the team, [an] essential part of the team. (Faculty)

Subtheme 2. Role on the Medical School Faculty

Overall participants were supportive and enthusiastic about dietitians teaching nutrition to medical students. They shared that it would enhance their knowledge about nutrition and be beneficial for students to know more about the work of dietitians while learning from professionals that have expertise in this area. Students expressed interest in improving their nutrition knowledge and learning practical information from someone with clinical experience not just theoretical knowledge, and that it is beneficial to learn from health professionals with a different perspective on patient care. Despite support from most participants, one faculty doctor expressed concern about dietitians educating future doctors, and cited possible barriers including insufficient education along with a lack of time and confidence to teach medical students.

It is important . . . that the medical student knows that he is taught by a dietitian and that someone like that actually exists. And maybe someone like that can have a deeper knowledge of nutrition than the doctor. (Faculty)

These things should be taught by (a) professional that has studied [nutrition]. (Faculty)

I think the overall approach to the patient is different and [about] . . . the important role of nutrition. And so, perhaps as a reminder that [nutrition] is an integral part of taking care of the patient. (Grade 6, CZ program)

That would definitely enhance our knowledge on nutrition. (Grade 6, EN program)

Practical experience and . . . some cases, that it is very beneficial for the students. (Faculty)

Subtheme 3. Importance of Interdisciplinary Care

Overall, the participants supported doctors and dietitians working together to provide patients with good nutrition care. They endorse the benefit of having access to dietitians in clinical care. In cases when they may not have adequate nutrition knowledge, both future doctors and faculty doctors recognize the benefits of consulting with or making referrals to dietitians. But the support for interdisciplinary care was not universal, as one Grade 3 student expressed hesitancy, with an inclination to rely on his own nutrition knowledge rather than cooperating with the nutrition expert.

I can learn about diets and those facts that they know we are—more or less—learning too. So, in that case, I don't understand the cooperation [between dietitians and doctors] much. (Grade 3, CZ program)

As a doctor, I definitely can imagine that in every hospital that there will be a dietitian and we can work together. (Grade 3, CZ program)

I think they need to work hand in hand on certain situations and with certain patients. Cause that's in the patient's best interest. (Grade 2, EN program)

If they [doctors] do not feel competent to give the patient that kind of advice, they should contact the dietitian. (Grade 4, CZ program)

I mean the doctor would handle the medicine but then the diet, maybe the doctor is not so well educated or informed about diets that diabetic patients should have. So, in this case he would contact the dietitian. (Grade 6, EN program)

But it makes our work easier because we can send [those patients] to a dietitian or we can call a dietitian. (Faculty)

Theme 4. Opportunities for Nutrition Education in Medical School

Subtheme 1. Student Interest in Personal Nutrition for Self-Care

While students expressed interest in learning about nutrition to support their work as future doctors, they also expressed the importance of improving their nutrition knowledge to promote healthy eating during medical school. With students coming from different countries as well as some leaving home for the first time, they emphasized the need for practical knowledge about general nutrition, meal planning and food choices to support a healthy lifestyle now and in the future. This includes both practical nutrition education as well as access to dietitians for personal counselling and advice.

Many students, they are coming from abroad without, without relatives here. So, they don't have the time also to know to research about [food and nutrition]. Like when we go home, we have to sleep, wake up and study. So, if you have no knowledge of [nutrition] . . . then you cannot concentrate. (Grade 1, EN program)

I don't think many students know how to [eat properly]. In fact, they eat at home and then they come to university and they have to decide what to eat for themselves. (Grade 1, CZ program)

But I think it is very important to teach first the students how they should eat right. (Grade 2, EN Program)

[As a doctor,] how am I supposed to care for someone else if I don't know how to care for myself? (Grade 2, EN program)

You know medical students . . . have so much pressure and stress that for them it's important that they have a good diet and to maintain the healthy diet. (Grade 6, EN program)

It would certainly be interesting to have the option of going to a dietitian . . . and have an opportunity to learn some information about nutrition. (Grade 2, CZ Program)

Subtheme 2. Interest in More Practical Education and Training

Participants offered suggestions to address their concerns regarding nutrition education at MU. Students identified specific nutrition topics that they would like to learn more about during medical school (see Table 8). Moreover, students and faculty shared preferred methods of education as well as skills and resources needed for medical practice.

Table 8

Student's Most Popular Responses to Nutrition Topics of Interest (Listed in Order of Preference)

Nutrition Topics of Interest <i>n</i> =number of participants
General Nutrition (<i>n</i> =19)
Popular Diets (<i>n</i> =14)
Meal Planning and Cooking (<i>n</i> =13)
Therapeutic Nutrition (Nutrition and Disease Management) (<i>n</i> =12)
Sports Nutrition (<i>n</i> =4)

Overall, they preferred interactive experiences to develop practical skills including case studies, role plays and opportunities to learn from experienced clinicians through both lectures and demonstrations. Additionally, they desired opportunities to observe dietitians delivering nutrition counselling and advice. Students were not in agreement about how to offer this training and reported it can be delivered through non-obligatory lectures, direct observation or in a nutrition class.

When discussing pathophysiology and the treatment of certain diagnoses, we could incorporate it and emphasize not only the medication itself, but also the overall regimen of the patient with an emphasis on nutrition. (Faculty)

[To observe] a conversation with a nutritional therapist. . . . I think that one morning would teach a lot more than some books. (Grade 6, EN program)

Offer some elective courses for students who are interested . . . divide them into sub-topics. (Grade 3, EN program)

Explicitly drawing up a diet for a particular patient could be beneficial. (Grade 6, CZ program)

I think it is more interesting with case studies. (Grade 6, CZ program)

Discussion

The objective of this study was to identify and examine student and faculty perceptions about the role of dietitians and nutrition in medical care and about nutrition education in medical school.

Our results indicate that participants clearly perceived the important role of nutrition in medical care and offered a variety of reasons to support the essential connection between good nutrition in the treatment and healing for a variety of diagnoses.^{35,36} In addition, both students and faculty emphasized the role of nutrition in health, noting the connection and benefits for prevention and overall well-being. This is consistent with the literature supporting nutrition's critical role in health and medical care for a variety of populations and conditions including chronic disease prevention and treatment.^{5-9,18} In this study, participants specifically expressed the necessity of good nutrition for many groups, including medical students. They acknowledged the stress associated with medical school and the challenges faced by students including missing

meals due to long hours of studying and reliance on costly and unhealthy fast foods. This recognition was notable to the researchers and is consistent with results from other studies.^{37,38} In recent years this has been addressed in part through the emergence of culinary nutrition education in medical schools^{37,39} which blends “the art of food and cooking with the science of medicine.”⁴⁰ Several of our pre-clinical student participants in both programs acknowledged they are living away from home for the first time, for those in the EN program this may be their first time in the CR, offering new challenges for acclimating to new food choices and availability. Considering the important role of nutrition for self-care and for patient care, it is not surprising that most of our participants affirmed that doctors have an important role to play in providing nutrition information to patients, which is consistent with the literature.^{24,29,41} Like other studies, participants identified similar barriers to providing nutrition care including limited time during the patient visit, their lack of nutrition knowledge and limited confidence in delivering nutrition education and advice. Despite these barriers, research in the United States and Europe documents that patients view their doctor as a reliable source of advice for healthcare issues including nutrition,^{11,12,42} thus emphasizing their role in the healthcare system. In addition, many participants recognized that patients not only seek advice, but also are aware of the health decisions that doctors make, including what they eat. Thus, as is consistent with other research many of our students acknowledged that doctors should serve as role models for patients.⁴¹ This further emphasizes the importance of nutrition education for medical students, as studies show nutrition education and knowledge can

translate into healthier behaviors that may support improved nutrition care for patients.^{43,44}

Finally, while evidence supports the importance and benefits of doctors offering nutrition care to patients^{36,42,45} in many healthcare settings they can make referrals to other health professionals including dietitians^{18,24,35,46} but it may not happen consistently in practice.^{44,47} This is essential because the nature of nutrition care requires time, follow up and support to promote knowledge and behavior change, and dietitians are the health professional with skills and education to offer nutrition care called medical nutrition therapy (MNT). This is the ability to apply evidence-based knowledge about nutrition to assess, counsel and education patients about the prevention, treatment and management of nutrition-related disorders,^{16,17} and there is a growing body of evidence to support the clinical benefits of offering MNT to patients,^{19,20} yet some students expressed hesitancy to make referrals to dietitians, thus suggesting limited awareness or demonstration in clinical training. While they expressed support for doctor's role in providing nutrition care, participants shared concerns about the current level of nutrition education.

Regarding the nutrition education at MU, there were varied responses. While many students praised the theoretical education offered in the first years of the program, they also expressed frustration about learning some theory that is impractical^{21,48} as opposed to the more practical application of information in their clinical education and training. The lack of practical application in clinical education is consistent with results from other qualitative studies of medical school students.^{29,49,50} Following qualitative interviews with medical students in Ghana, Mogre et al. reported nutrition education was

inadequate due to the poor application of nutrition science to clinical practice as well as lack of priority for nutrition education.²⁹ Most MU students expressed that while certain subjects emphasized nutrition including pediatrics, oncology, public health, overall, nutrition education was insufficient and not emphasized. This was expressed by students in preclinical and clinical stages of the program. Similar to other medical schools throughout the world, a lack of emphasis was identified by various factors including limited nutrition information discussed in courses,^{44,51} nutrition topics not included on exams,^{51,52} and no standalone nutrition course.⁵³ In addition, the insufficient amount of nutrition education reported by the participants was consistent with findings from a recent curriculum assessment at MU²⁵ that documented fewer hours of nutrition education than the average in other European medical schools,^{22,23} and less than recommendations.⁵⁴ This is further exacerbated because nutrition science continues to change and evolve as new evidence and information is discovered, thus requiring faculty to spend time updating their knowledge and teaching materials as they prepare for lectures. Faculty expressed concern because others are not updating their lectures. In addition, faculty participants reported additional barriers to teaching nutrition topics that are consistent with other studies that included a crowded curriculum and limited time available for more information.^{46,51}

Unfortunately, participants reported that the limited emphasis and hours of nutrition education in the pre-clinical education continues into the clinical courses and training. Students perceived that faculty teaching clinical courses did not discuss or demonstrate the application or offering of nutrition care to patients, which was

consistently reported in other medical schools.^{30,49,53,55} One student perceived an emphasis on other disciplines including pharmacy and physical therapy but not nutrition in clinical practice. In addition, the lack of clinical emphasis on nutrition was evidenced by comments from future doctors preparing for graduation that reported a lack of confidence offering nutrition advice or education to patients. This finding is consistent with studies at other medical schools around the world.^{35,55} Considering the evidence that doctors have the potential to improve their patient's dietary habits by providing nutrition advice^{42,45} it is important that future doctors are prepared to counsel patients. Overall, students were supportive of the opportunity to learn about nutrition in their clinical training, which is underscored by the measures in the Decade of Action on Nutrition to ensure that all health professionals can provide at least basic evidence-based nutrition advice,⁵⁶ and other research that specifically endorsed the benefits of working as part of a team to provide nutrition care.^{46,57} Unfortunately, MU students reported limited exposure or awareness about the role of dietitians, the nutrition professionals in healthcare.

Despite perceptions about the important role of nutrition in medical care, there was limited awareness about the role of dietitians, with nearly half of the students reporting no professional experience working with a dietitian and more than a third unclear about their role. This includes students from all grades in both programs including some in their final year preparing to graduate. The lack of awareness and clinical experience with dietitians may be due in part to the limited emphasis on nutrition care from faculty clinicians as reported by students. Thus, if the faculty do not include and emphasize nutrition in patient care, that may preclude students from interacting with

them and learning more about the role of dietitians in the healthcare. Additionally, this lack of emphasis from faculty may reflect the historical perspective of dietitians in the CR as food service workers rather than their role as trained nutrition professionals in a clinical setting (see Chapter III). The limited awareness about dietitians in clinical practice is further underscored by students in their clinical years reporting that they have never seen a dietitian, or the final year student that recognized dietitians as beneficial but acknowledged no personal interaction with a dietitian. This further underscores the limited recognition about the role of dietitians in clinical care in CR, and thus the possibility of doctors not involving them when patients may benefit from nutrition related care.¹⁸ It is important to note that faculty views may differ. All faculty participants expressed awareness about the role of dietitians, and clinicians identifying they have worked with them and recognized the role and benefits of cooperating with them to provide nutrition care for patients. Despite this recognition, one physician acknowledged that dietitians are not well respected in CR. In addition, despite the lack of awareness about the role dietitians and interactions in clinical care, a majority of students and faculty supported the role of dietitians on the medical school faculty. This is consistent with the literature demonstrating the important role and benefits of dietitians planning and delivering nutrition education to medical students.^{51,58} The support from the student participants is likely due in part to the responsibility of dietitians at MU for planning and delivering the public health training about nutrition to medical students. Thus, many students had experience with dietitians offering classroom education and most expressed support for opportunities to learn from professionals with nutrition knowledge, practical

experience in clinical care and enthusiasm about the topics discussed. As students continue to graduate, the direct involvement between dietitians and medical students in the classroom may help to promote future collaboration, awareness, and recognition for the role of dietitians in the clinical setting.

Not surprisingly, most students and faculty supported doctors and dietitians working together to provide nutrition care for patients. While one Czech student expressed a preference for relying on his own nutrition knowledge, most others supported the opportunity to collaborate with dietitians and acknowledged that it is in the patient's best interest.⁵⁷ In addition, faculty members shared their support and positive experiences about referring patients to dietitians to improve patient care. This recognizes that medical care is a team sport, and the benefits of interdisciplinary care are well documented and supported by global organizations including the WHO and the European Society for Clinical Nutrition and Metabolism (ESPEN) as well as in the literature.^{3,59,60} With evidence to support nutrition's critical role in the management, treatment and prevention of many health conditions including NCDs, as the nutrition experts' dietitians are recognized as key members of the interdisciplinary teams in healthcare facilities around the world. While the participants in this study supported the notion of interdisciplinary care including dietitians, the lack of awareness and contact with dietitians in clinical care suggested that this is not yet fully realized in CR.

As a demonstration of their recognition about the importance of nutrition in health and wellness, nearly half of the students expressed a desire for nutrition education for self-care. This came from students in all years, but the interest was for this education to

be provided in the pre-clinical education during grades 1 and 2. While this timing reflects a practical need for students that are living away from home for the first time, many expressed a specific concern for students in the EN program that are coming to CR for the first time as this presents additional nutritional challenges due to a new language, culture, and cuisine. Students expressed an interest in learning about basic nutrition and healthy eating including meal planning, cooking, and shopping. Overall looking for cost effective strategies to maintain good health and nutrition while managing the demands of the medical school. This is supported in the literature as culinary nutrition is an emerging trend in medical education.^{37,39} The evidence from different programs supports that involving students in meal prep not only enhances their personal nutrition and cooking skills, but also increases nutrition knowledge and awareness about therapeutic diets.³⁸ An additional benefit to improving knowledge and awareness about nutrition and wellness, is that this may make the future doctors better nutrition educators or counselors as role models for their patients. Several participants lamented “how can I take care of others if I can’t take care of myself?” Research demonstrates the importance of self-care for doctors with evidence showing that doctors that practice healthful behaviors are more effective counselors for patients.^{43,61} Additionally, in an effort to support this implementation of their training, a few students requested access to dietitian visits for personal nutrition advice. All of these opportunities may serve to promote nutrition knowledge and education for medical students as well as provide greater awareness about the role of dietitians and support cooperation in the future. Furthermore, they emphasize the students desire for more practical education and training about nutrition. Students expressed

interest in more practical education on current nutrition topics. These topics are included in published curriculums for culinary medical programs.³⁷ In addition to specific nutrition topics, students identified an interest in more interactive lessons with practical information. They identified suggestions for more interactive education such as role plays, case studies facilitated by dietitians, and developing a meal plan for a patient. Furthermore, they requested opportunities to shadow dietitians and observe their patient interactions including nutrition counseling and education, preparing a nutrition assessment and the identification of reliable nutrition resources. More practical methods of education are supported in the strategic plan at MU,⁶² and in the literature.^{39,58,63}

This study and analysis have some limitations. First because we had no knowledge about the perceptions of nutrition education in Czech medical schools, we used a convenience sampling approach to recruit participants from MU. A more representative sample may have identified different viewpoints, as most of the participants expressed support for the role of nutrition in medical care. Our sampling was not designed for comparative analysis thus limiting the ability to compare results between participants from the EN and CZ programs which may have identified additional differences or viewpoints. Additionally, because we recruited students in all grades at various stages of their education, some have more limited experience with the education system and clinical training at MU which may have impacted the perceptions and opinions expressed at the time of the data collection. Furthermore, we successfully recruited only a limited number of faculty members representing a few departments and with varying clinical experience. It is possible that more faculty participants may have

contributed different information and perceptions about the nutrition education offered at MU. Although our question sets were modified to account for the different levels of experience this may not adequately be reflected in the analysis. Furthermore, while the analysis from this qualitative research may serve to inform and contribute to the literature, it is not necessarily generalizable to other medical schools in CR and around the globe. In addition, although it is beneficial to obtain viewpoints from students and faculty in both the CZ and EN programs, the translation of materials and transcripts may have resulted in the loss of subtle information.

Implications

Overall, the participants of this study recognized the important role of nutrition in medical care but acknowledge the limited emphasis on nutrition education throughout medical school. Most of the participants desired additional nutrition education in medical school to promote self-care and prepare for clinical practice. Additionally, it appears that dietitians are not well recognized by MU students for their role as nutrition experts in clinical care, thus supporting the development of opportunities for improving the nutrition education for students at MU that includes not only practical training to improve nutrition knowledge and develop clinical skills but also by employing methods to increase the awareness and recognition about the roles of dietitians in medical care and education. Thereby improving opportunities for cooperation with dietitians to promote optimal nutrition care for patients in the Czech Republic.

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CHAPTER VI

EPILOGUE

When I started this pursuit in August of 2016, I would have no way to anticipate where this journey would take me or how it will end. I can say it has been far more interesting and richer than expected, and I am thankful for the other PhD students in my cohort that have already completed this degree as they have inspired me to continue. Although it is exciting and stimulating to live in Central Europe, this journey has been lonely at times. Particularly when I was lacking the daily support from friends, family and through campus life. But I am thankful for the community that I have developed here including my colleagues at Masaryk University, as well as my Czech language classes, Pilates group and our church family at Brno International Christian Fellowship. I was also thankful for the connection with UNCG, through regular contact with Lauren Haldeman and other students, as well as my remote participation in Nutrition Seminar. It was very helpful and important to stay connected, and who knew that as the first remote student I would be well prepared for education during the pandemic.

It is hard to separate the challenges of living abroad from those associated with earning a PhD. But to experience these things concurrently tested me in ways I could not have expected. For example, while I was on my own and had to figure things out without much assistance at times. I valued the time I had to think and ponder things, which certainly offered me additional insights into this process and inspired confidence in my

ability to sort things out on my own and then receiving confirmation later. In fact, that has been one of the most frustrating, but valuable aspects of this experience. The fact that my PhD project has been my job was a great luxury. It enabled me to remain focused, not to rush, to do things again when needed and have the time to sort things out along the way. I have become much more self-reliant and appreciative of the wonderful collaborators I have at Masaryk University. Particularly as we met in our “office” at Café Mitte near the campus. Our meetings were a nice combination of social time along with business, and I have recognized that these colleagues are some of the best I have had during my professional career. I could not be more grateful and appreciative of their support, professionalism, and friendship.

I really enjoyed the process of data collection during our interviews. I learned from our study participants that nutrition matters to them, and not just for patient care but for their own health. I was inspired by the accounts from our students that shared how nutrition has impacted their lives, and thus revealed why they requested more nutrition knowledge about personal care and healthful eating. This will serve not only to support them as their rigorous training continues in pursuit of a career as a doctor, but also so that they can better serve their patients by living through example. I got new insights from them and look forward to future work with this population.

I continue to recognize and appreciate having time to reflect on the main goals of this project and feel very proud to support a worthy goal: to improve nutrition care and support the forward movement of dietitians in the Czech Republic. At some point along the way I realized that my main goal was not to earn a PhD, but rather to support the

mission of my fellow dietitians here and help to enable them to gain recognition and improve awareness of their ability to support and improve the health of the population through nutrition care. To increase the respect and role they play among health professionals, by elevating them above the perception of a food service worker.

I am also pleased to be a finalist for a Fulbright postdoctoral award. Something I had never even considered until last year. Although the application process was much more involved and rigorous than anticipated, it was well worth the effort as I remain hopeful for success and a wonderful follow up project to continue our research and promote the importance of nutrition and dietitians in the Czech Republic.

As I prepared to complete my dissertation, I may be one of the few people in Brno that does not mind the lock down during the COVID pandemic. The forced time at home has limited my distractions from travel and holiday gatherings and kept me at home with time to work on the data analysis and writing. So now with my thesis completed, I am looking forward to improving my Czech language skills, reading a few books, resuming my food blog and preparing some new Czech foods.

APPENDIX A

CONSENT CZECH AND ENGLISH

INFORMOVANÝ SOUHLAS S ÚČASTÍ VE VÝZKUMU

Informace pro účastníky výzkumu

Název projektu: *Nutrition from Theory to Practice: Perceptions of Nutrition Education for Medical Students at Masaryk University*

Výživa od teorie k praxi aneb jak je vnímána výuka výživy na LF MU

Cíl projektu

Cílem kvalitativního výzkumu je posoudit vnímání výuky výživy na Lékařské fakultě Masarykovy univerzity v Brně. Zaujímají nás zkušenosti a názory studentů a zaměstnanců týkající se výuky výživy a dále pohled na práci nutričního terapeuta a případně komplikace, se kterými jste se během výuky setkali.

Cílovou skupinou tohoto výzkumu jsou studenti medicíny a zaměstnanci fakulty (lékaři i jiní pracovníci).

Výsledky tohoto výzkumu budou zprostředkovány Lékařské fakultě MU skrze závěrečnou zprávu, která bude sloužit k identifikování problémů ve výuce a k jejich možnému zlepšení. Očekávaný přínos pro společnost spočívá v podpoře nutriční péče pacientů. Výsledky budou dále použity v akademických publikacích a na konferencích.

Výzkumný tým

Výzkum je prováděn na Ústavu ochrany a podpory zdraví na Lékařské fakultě MU ve spolupráci s Katedrou výživy na Univerzitě v Severní Karolíně v Greensboro (USA) (UNCG). Za organizaci projektu jsou zodpovědné osoby Victoria Hawk a Zlata Kapounová. Kontakt na vedoucího výzkumného pracovníka je: **Zlata Kapounová:** z.kapounova@med.muni.cz, [Ústav ochrany a podpory zdraví LF MU, Kamenice 5 – A21, Brno 625 00. Kontakt na vedoucího výzkumného pracovníka UNCG je](#) Victoria Hawk: vhhawk@uncg.edu a kontakt na odborného poradce (Faculty Advisor) za UNCG je Dr. Lauren Haldeman: lahaldem@uncg.edu.

Financování a doba trvání výzkumného projektu

Tento výzkum je podpořen grantem **MUNI/A/1278/2018** (*Prohlubování znalostí v oblasti zdravotních rizik a benefitů výživy, prostředí a životního stylu*) zprostředkovan Masarykovou univerzitou a probíhá od 1. ledna do 31. prosince 2019.

Sběr a zpracování informací

Informace od účastníků budou získány prostřednictvím jednorázového rozhovoru trvajícího přibližně 30-45 minut. Každý rozhovor bude zachycen na zvukový záznamník

a následně bude přepisován pro další hodnocení. Před analýzou budou přepisy rozhovorů pseudonymizovány, tj. opatřeny unikátním kódem, pod kterým budou dále zpracovávány a deidentifikovány (všechny osobní údaje a místní názvy budou odstraněny).

Získaná data budou uchovávána v elektronické podobě v zabezpečené místnosti MU a na počítačích přístupných pod osobním heslem pouze osobám výzkumného týmu. Záznam rozhovoru bude uložen po dobu pěti let od ukončení studie, stejně jako osobní údaje, které budou uloženy separovaně od rozhovorů (disk zabezpečeného počítače vs heslem opatřené úložiště dat - Box). Po pěti letech od ukončení projektu budou osobní údaje i nahrávka rozhovoru smazány. Přepisy budou uchovány na dobu neurčitou, pokud není v zaznamenaném souhlasu stanoveno jinak. Přepisy mohou být sdíleny mezi Masarykovou univerzitou a Univerzitou v Severní Karolině v Greensboro a to výhradně pro účely této studie.

Závěry z průzkumu budou publikovány zásadně v podobě souhrnných informací a formou anonymních citací, které vylučují jakoukoliv identifikaci jednotlivce.

Dobrovolnost

Vaše účast ve výzkumu je zcela dobrovolná. Během rozhovoru můžete odmítnout odpovědět na jakoukoli z kladených otázek, přerušit nebo ukončit rozhovor, případně klást doplňující otázky týkající se výzkumu. Z účasti ve výzkumu pro Vás neplynou žádné výhody či nevýhody. Jako poděkování za účast ve studii bude předán voucher na hodinu konzultace nutričním terapeutem.

Pokud se rozhodnete z průzkumu odstoupit, můžete tak učinit kdykoliv bez udání důvodů a bez jakéhokoli postihu, stejně tak máte právo požádat výzkumného pracovníka o zpětné upravení nebo výmaz informací kdykoli v průběhu konání studie. V těchto případech se můžete obrátit na vedoucího výzkumného pracovníka, **Zlatu Kapounovou**: z.kapounova@med.muni.cz.

Kontakt na pověřence pro ochranu osobních údajů Masarykovy univerzity

V případě jakéhokoli problémů či otázek týkajících se zpracování osobních údajů můžete kontaktovat osobu odpovědnou za ochranu osobních údajů na Masarykově univerzitě. Kontaktní e-mail: poverenec@muni.cz nebo na americký Úřad pro integritu výzkumu (UNCG Office of Research Integrity) na telefonním čísle: +1 855-251-2351.

SOUHLAS S ÚČASTÍ VE VÝZKUMU

Název výzkumu: Výživa od teorie k praxi aneb jak je vnímána výuka výživy na LF MU

Vedoucí výzkumný pracovník: Zlata Kapounová

Tento výzkum je podpořen grantem **MUNI/A/1278/2018**

*Prosím označte
každé pole*

- | | | |
|----|--|---|
| 1 | Potvrzují, že jsem přečetl/a a porozuměl/a dokumentu „Informace pro účastníky výzkumu“ (str. 1-2) pro výše zmíněnou studii. Měl/a jsem příležitost prostudovat informace, položit otázky a dostal/a jsem uspokojující odpovědi. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 2 | Rozumím, že má účast na výzkumu je dobrovolná a že můžu kdykoliv odstoupit ze studie bez udání důvodu. Odstoupení ze studie pro mě nebude mít žádné nepříznivé důsledky. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 3 | Rozumím, že výzkumné údaje shromážděné během výzkumu mohou být sdíleny osobami z Masarykovy univerzity a z Univerzity v Severní Karolíně v Greensboro pro účely tohoto výzkumu. Uděluji souhlas těmto osobám, aby měly přístup k informacím a výzkumným údajům týkajících se mé osoby. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 5 | Rozumím, že tento projekt byl přezkoumán a schválen Etickou komisí Masarykovy univerzity a Správní radou Univerzity v Severní Karolíně v Greensboro. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 6 | Rozumím tomu, kdo bude mít přístup k získaným datům, jak budou data uchovávána a jak bude s daty naloženo po skončení výzkumu. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 7 | Rozumím tomu, jak budou data k tomu výzkumu zpracovávána a publikována. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 8 | Jsem si vědom/a, že můžu klást otázky, vyjádřit obavy nebo podat stížnost. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 9 | Souhlasím s nahráváním rozhovoru. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 10 | Rozumím tomu, jak bude nakládáno se zvukovými nahrávkami a jak budou sloužit v analýze získaných dat. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 11 | Rozumím a souhlasím, že výsledky výzkumu mohou být použity ve výuce, publikacích a během prezentací na vědeckých konferencích. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 12 | Souhlasím s účastí na výzkumu. | <input style="width: 60px; height: 25px;" type="checkbox"/> |
| 13 | Byl/a jsem informován/a to tom, že obdržím jeden originál tohoto informovaného souhlasu včetně písemně poskytnutých informací. | <input style="width: 60px; height: 25px;" type="checkbox"/> |

Na základě přečtení dokumentu „Informace pro účastníky výzkumu“ prohlašuji, že jsem porozuměl/a jeho smyslu a souhlasím se svou účastí ve výzkumu.

Byl/a jsem informován/a, že:

1. mám právo požadovat přístup k osobním údajům týkajícím se mé osoby, jejich **opravu** nebo **výmaz**, popřípadě omezení zpracování,
2. mám právo **vznést námitku** proti zpracování osobních údajů týkajících se mé osoby,
3. mám právo **podat stížnost** dozorovému orgánu (Úřad na ochranu osobních údajů) v případě, že se domnívám, že zpracování mých osobních údajů probíhá v rozporu s právními předpisy,
4. získaná pseudonymizovaná data mohou být předána **dalším subjektům** (spolupracujícím odborníkům a institucím), výhradně však za účelem vědeckého výzkumu,
5. mám právo tento souhlas se zpracováním osobních údajů **kdykoliv odvolat**, aniž by mi za to hrozila jakákoliv sankce či znevýhodnění, a to **e-mailem na adresu z.kapounova@med.muni.cz**, případně oznámením na kontaktní údaje pro zpracování osobních údajů. Zákonnost zpracování údajů před odvoláním souhlasu tím není dotčena.

Na základě výše uvedených informací uděluji tímto Masarykově univerzitě (jako správci a zpracovateli osobních údajů) souhlas se zpracováním osobních údajů za účelem vědeckého výzkumu a to na dobu 5 let po ukončení studie.

Jméno a příjmení účastníka výzkumu

Datum

Podpis účastníka výzkumu

Jméno a příjmení osoby za výzkumný tým
(nebo osoby pověřené, která poskytla informace)

Datum

Podpis osoby za výzkumný tým
(nebo osoby pověřené, která poskytla informace)

PARTICIPANT INFORMED CONSENT

Information for Participants in Research

Project Title: Nutrition from Theory to Practice: Perceptions of Nutrition Education for Medical Students at Masaryk University

The aim of the project

The aim of this qualitative research project is to assess the perceptions of nutrition education in medical school at Masaryk University in Brno, Czech Republic. We are interested in identifying and describing the views and experience of students and faculty members regarding the nutrition education offered at Masaryk University (MU) medical school as well as their perceptions of dietitians and any barriers to nutrition education. The target groups for this research project are MU medical students and faculty (MDs and non-MDs).

The results of this research will be provided to the Faculty of Medicine at MU in the form of a research report that summarizes findings and makes recommendations with the goal of identifying opportunities to improve nutrition education at MU medical school. We anticipate that this will benefit society by promoting nutrition care for patients. The results will be also used for academic publications and conferences.

The research team

The research is conducted by the Department of Public Health in the Faculty of Medicine at Masaryk University and the Department of Nutrition at the University of North Carolina at Greensboro, USA (UNCG). Zlata Kapounová and Victoria Hawk are responsible for the organization of the project. The contact for the lead researcher at Masaryk University is **Zlata Kapounová**: z.kapounova@med.muni.cz, at The Department of Public Health, Faculty of Medicine, Masaryk University, Kamenice 5 – A21, Brno 625 00. The contact information for the lead researcher at UNCG is Victoria Hawk: vhhawk@uncg.edu and the contact for the UNCG Faculty Advisor is Dr. Lauren Haldeman: lahaldem@uncg.edu.

Funding and duration of the research project

This research is supported by the grant **MUNI/A/1278/2018** (*Improving knowledge about health risks and benefits of nutrition, environment and lifestyle*) provided by Masaryk University. Its duration is from 1 January to 31 December 2019.

Collection and Processing of Information

The information from participants is gathered through interviews lasting approximately 30-45 minutes. Each interview is recorded by a voice recorder and transcribed for assessment. Before the analysis, the transcripts are pseudonymized (each participant receive a unique code under which the transcripts will be further processed) and deidentified (all names and identifiable information is removed).

The data collected will be stored in locked cabinets in a secure room on the campus of MU with electronic information stored securely on password protected computers using Box with access only by the research staff. The interview recordings and personal data will be stored for five years following the completion of the study. Five years after the project is completed, the personal data and the recordings will be destroyed. The transcripts will be retained indefinitely unless otherwise agreed in the consent. The transcripts can be shared between Masaryk University and The University of North Carolina at Greensboro for the purpose of this study.

The findings of the study will be published in the form of summary information and anonymous citations that exclude any individual identification.

Participation

Your participation in the research is voluntary. During the interview, you can refuse to answer any of the questions, interrupt or terminate the interview, or ask additional questions about the research. There are no advantages or disadvantages to participating in the research. As an incentive for participating in the study you will receive a voucher for nutrition counselling.

If you choose to withdraw from the study, you can do so at any time without giving any reason and without recourse. You have the right to ask the researcher to change or delete the information provided during the study. In such cases, you can contact the lead researchers: Zlata Kapounová, z.kapounova@med.muni.cz.

Additional problems concerning participation in the research

In the event of any personal data processing problems or questions, you can contact the person responsible for participants' privacy at Masaryk University, e-mail: poverenec@muni.cz or the UNCG Office of Research Integrity at telephone number +1 855-251-2351.

CONSENT DOCUMENT

Title of Research Study: Nutrition from Theory to Practice: Perceptions of Nutrition Education for Medical Students at Masaryk University

Principal Investigator: Zlata Kapounová

Supported By: This research is supported by **MUNI/A/1278/2018**

*Please initial
each box*

- | | | |
|----|--|---|
| 1 | I confirm that I have read and understand the Information for Participants in Research for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. | <input style="width: 60px; height: 25px;" type="text"/> |
| 2 | I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. Withdrawal from the study will not have any adverse consequences for me. | <input style="width: 60px; height: 25px;" type="text"/> |
| 3 | I understand that research data collected during the study may be looked at by designated individuals from Masaryk University and the University of North Carolina at Greensboro where it is relevant to my taking part in this study. I give permission for these individuals to access my information and research data. | <input style="width: 60px; height: 25px;" type="text"/> |
| 5 | I understand that this project has been reviewed by and received approval by the Medical Faculty Research Ethics Committee at Masaryk University and the University of North Carolina at Greensboro Institutional Review Board. | <input style="width: 60px; height: 25px;" type="text"/> |
| 6 | I understand who will have access to the data provided, how the data will be stored and what will happen to the data at the end of the project. | <input style="width: 60px; height: 25px;" type="text"/> |
| 7 | I understand how this research will be written up and published. | <input style="width: 60px; height: 25px;" type="text"/> |
| 8 | I understand how to ask a question, raise a concern or make a complaint. | <input style="width: 60px; height: 25px;" type="text"/> |
| 9 | I consent to being audio recorded. | <input style="width: 60px; height: 25px;" type="text"/> |
| 10 | I understand how audio recordings will be used to aid in data analysis. | <input style="width: 60px; height: 25px;" type="text"/> |
| 11 | I understand the results of this study may be used for teaching, publications, or for presentation at scientific meetings. | <input style="width: 60px; height: 25px;" type="text"/> |

*Please initial
each box*

12 I agree to take part in the study

13 Based on reading the document “Information for Participants in Research” I declare that I have understood its meaning and I agree with the participation in the research.

I have been informed:

1. I have the right to request access to, rectification or erasure of personal data relating to myself, or restrictions on processing,
2. I have the right to object to the processing of my personal data
3. I have the right to lodge a complaint with the supervisory authority (Office for Personal Data Protection) if I believe that the processing of my personal data is in violation of the law,
4. the pseudonymized data obtained may be passed on to other entities (cooperating professionals and institutions) but solely for the purpose of scientific research,
5. I have the right to withdraw consent to the processing of my personal data at any time, without any penalty or disadvantage for me, by e-mail to z.kapounova@med.muni.cz, or by contacting the person responsible for participants’ data privacy. This does not affect the lawfulness of data processing prior to the withdrawal of consent.

Based on the information above, I hereby grant Masaryk University (as administrator and processor of personal data) the processing of personal data for the purpose of scientific research for a period of 5 years following the completion of the study.

Signature of participant

Date

Printed name of participant

Signature of person from research team obtaining consent

Date

Printed name of person from research team obtaining consent

APPENDIX B**INTERVIEW GUIDE CZECH AND ENGLISH****MUNI
MED**THE UNIVERSITY of NORTH CAROLINA
GREENSBORO**Postup pro vedení rozhovoru****Sběr dat o účastnících studie****Studenti**

1. Ročník studia na LF MU
2. Prosím specifikujte blíže svou národnost
 - a. česká/slovenská
 - b. Jiná národnost
3. Pohlaví
4. Věk
5. Rodilý jazyk
6. Ve které zemi plánujete, že se budete věnovat lékařské praxi?

Členové fakulty LÉKAŘI

1. Pohlaví
2. Věk
3. Prosím specifikujte blíže svou národnost
 - a. česká/slovenská
 - b. Jiná národnost
4. Rodilý jazyk
5. Jaká je vaše lékařská specializace?
6. Kolik let pracujete na Lékařské fakultě MU?
7. Na kterém nebo na kterých ústavech, je-li jich více, pracujete?
8. Jaké předměty vyučujete? Jaká konkrétní témata přednášíte?
9. Provozujete klinickou praxi? Kde?
10. Kolik let klinické praxe máte za sebou?

Členové fakulty NE-LÉKAŘI

1. Pohlaví
2. Věk
3. Prosím specifikujte blíže svou národnost
 - a. česká/slovenská
 - b. Jiná národnost
4. Rodilý jazyk
5. Jaká je vaše specializace / oblast odborných znalostí?
6. Kolik let pracujete na Lékařské fakultě MU?
7. Na kterém nebo na kterých ústavech, je-li jich více, pracujete?
8. Jaké předměty vyučujete? Jaká konkrétní témata přednášíte?
9. Provozujete klinickou praxi? Kde?
10. Kolik let klinické praxe máte za sebou?

Návod k dotazům

Studenti

Hlavní dotazy	Hlavní podotázky
1. Jakou roli podle vás hraje výživa v léčbě pacienta?	<p>Jaká je podle vás úloha lékařů při poskytování nutriční péče?</p> <p>U kterých skupin populace, případně na kterých odděleních v nemocnici, jsou dle vás znalosti z výživy důležité?</p> <p>Při léčbě kterých onemocnění jsou dle vás znalosti z oblasti výživy důležité?</p>
<p>PŘESKOČIT pro 1. ROČNÍK, 1. semestr</p> <p>2. Co si myslíte o výuce výživy na LF MU?</p> <p>Ročník 1., semestr 1. : Kde vyhledáváte další informace o výživě?</p>	<p>Jak jste spokojen/a s úrovní znalostí u vyučujících, kteří přednášejí /učí o výživě?</p> <p>Povězte mi něco o vyučujících z fakulty, kteří by byli zapálení a nadšení pro výživu?</p> <p>Ve kterém roce studia a ve kterých předmětech si myslíte, že by výživa měla být zařazena?</p> <p>Kolik by podle vás mělo být v rámci studia věnováno výuce výživy?</p> <p>Kde vyhledáváte další informace o výživě?</p>
<p>PŘESKOČIT pro 1. ROČNÍK, 1. semestr</p> <p>3. Jak kvalitně vás škola v rámci svých předmětů připravuje na řešení výživových/nutričních problémů u pacientů?</p> <p>Ročník 1., semestr 1.: Jaké téma z výživy by vás zajímalo? O jakém tématu byste se rád/a dozvěděl/a víc?</p>	<p>Ve kterých předmětech jste získal/a nejvíce znalostí o výživě?</p> <p>Do jaké míry vám vyučující názorně předvádějí, jak edukovat pacienta o výživě? Nebo jak poskytnout pacientům radu týkající se výživy?</p> <p>Popište mi prosím, zda je stávající výuka v oblasti výživy dostačující, aby vás připravila na klinickou praxi či nikoli?</p> <p>Jak si myslíte, že by mohly být informace o výživě lépe začleněny do výuky a/nebo do vaší odborné praxe?</p>

Hlavní dotazy	Hlavní podotázky
	<p>Jaké téma z výživy by vás zajímalo? O jakém tématu byste se rád/a dozvěděl/a víc?</p>
<p>4. Jaké informace nebo dovednosti potřebujete k tomu, abyste pacientům dokázali poskytnout adekvátní nutriční péči?</p>	<p>Jak moc se cítíte být jistá/ý při hodnocení výživového stavu pacienta?</p> <p>Jak moc se cítíte být jistá/ý při poskytování poradenství v oblasti výživy nebo při edukaci pacienta o výživě?</p> <p>Jaký typ školení o výživě potřebujete, abyste se cítil/a připraven/a do praxe?</p> <p>Co může škola změnit nebo udělat pro to, aby byli studenti dobře připraveni na řešení výživových/nutričních problémů u pacientů?</p>
<p>5. Jak vnímáte úlohu nutričních terapeutů (NT) v péči o pacienta? Ve výuce mediků? V jiných oblastech?</p>	<p>Povězte, jaké služby podle vás mohou NT nabídnout?</p> <p>Jaké jsou vaše zkušenosti s NT?</p> <p>Co si myslíte o začlenění NT do výuky na LF MU pro témata týkající se výživy?</p> <p>Kdy nebo v jakých situacích byste doporučil/a pacientům návštěvu NT?</p>
<p>6. Jak vidíte výživu z hlediska jejího začlenění do vaší budoucí lékařské praxe?</p>	<p>Pakliže již víte, můžete nám prosím sdělit, v jaké oblasti medicíny se plánujete dále specializovat?</p>

Návod k dotazům

Členové fakulty lékařů

Hlavní dotazy	Hlavní podotázky
1. Jakou roli podle vás hraje výživa v léčbě pacienta?	<p>Jaká je podle vás úloha lékařů v poskytování nutriční péče?</p> <p>U kterých skupin populace, případně na kterých odděleních v nemocnici, jsou dle vás znalosti z výživy důležité?</p> <p>Při léčbě kterých onemocnění jsou dle vás znalosti z oblasti výživy důležité?</p>
2. Jak jste získal znalosti o výživě?	<p>Byla výživa nedílnou součástí vašeho vzdělání na univerzitě? Jaké předměty o výživě jste absolvoval/a?</p> <p>Jak jste se dále vzdělával/a ve výživě po ukončení univerzity? (např. kurzy, knihy, časopisy, atd.)</p> <p>Kde nyní získáváte informace o výživě?</p> <p>Jak se připravujete do výuky, přednášíte-li téma týkající se výživy?</p>
3. Co si myslíte o výuce výživy a jejím postavení v kurikulu na LF MU?	<p>Myslíte si, že je výživa ve výuce mediků řešena adekvátním způsobem? Nebo v klinické praxi? Která témata týkající se výživy výuka pokrývá?</p> <p>Kdy by měla být podle vás výživa zařazena do výuky během studia?</p> <p>Dokážete prosím popsat, jaké jsou největší problémy týkající se výuky výživy?</p>
4. Jak škola připravuje studenty na řešení otázek souvisejících s výživou u pacientů?	<p>Kdo, případně kolik vás vyučuje výživu na vašem ústavu?</p> <p>Jsou na vašem pracovišti členové fakulty, které lze považovat za odborníky na výživu? Víte, která témata vyučují?</p>

Hlavní dotazy	Hlavní podotázky
	<p>Jak jsou studenti školeni, aby byli schopni poskytnout radu o výživě nebo edukovat pacienta o výživě?</p> <p>Je podle vás výuce výživy věnováno dostatek času, resp. výukových hodin na LF MU? Proč ano, pro ne? Jaká témata z výživy by se měla přednášet ve výuce? Jsou tato témata zahrnutá v osnovách výuky?</p> <p>Myslíte si, že jsou ve výuce probírány důležité otázky a témata z oblasti výživy?</p> <p>Existují podle vás nějaké možnosti, jak by se dala výuka výživy zlepšit/zkvalitnit?</p>
<p>5. Jak vnímáte úlohu nutričních terapeutů (NT) v péči o pacienta? Ve výuce mediků? V jiných oblastech?</p>	<p>Jaké služby podle vás mohou NT nabídnout?</p> <p>Jaké jsou vaše zkušenosti s NT?</p> <p>Co si myslíte o začlenění NT do výuky na LF MU pro témata týkající se výživy?</p>
LÉKAŘI s vlastní klinickou praxí	
<p>6. Snažíte se začlenit výživu také do vaší lékařské praxe? Jakým způsobem?</p>	<p>Doporučujete nebo odesíláte své pacienty k NT? Z jakých důvodů a za jakým účelem?</p> <p>Edukujete své pacienty o výživě/dietě nebo poskytujete jim rady ohledně výživy? Za jakých podmínek?</p> <p>Jaké edukační materiály (letáčky o výživě) nabízíte svým pacientům? Odkud je získáváte?</p> <p>Konzultujete s NT některé problémy ve výživě svých pacientů?</p>

Návod k dotazům

Členové fakulty ne-lékaři

Hlavní dotazy	Hlavní podotázky
1. Jakou roli podle vás hraje výživa v léčbě pacienta?	<p>Jaká je podle vás úloha lékařů v poskytování nutriční péče?</p> <p>U kterých skupin populace, případně na kterých odděleních v nemocnici, jsou dle vás znalosti z výživy důležité?</p> <p>Při léčbě kterých onemocnění jsou dle vás znalosti z oblasti výživy důležité?</p>
2. Jak jste získal znalosti o výživě?	<p>Byla výživa nedílnou součástí vašeho vzdělání na univerzitě? Jaké předměty o výživě jste absolvoval/a?</p> <p>Jak jste se dále vzdělával/a ve výživě po ukončení univerzity? (např. kurzy, knihy, časopisy, atd.)</p> <p>Kde nyní získáváte informace o výživě?</p> <p>Jak se připravujete do výuky, přednášíte-li téma týkající se výživy?</p>
3. Co si myslíte o výuce výživy a jejím postavení v kurikulu na LF MU?	<p>Myslíte si, že je výživa ve výuce mediků řešena adekvátním způsobem? Nebo v klinické praxi? Která témata týkající se výživy výuka pokrývá?</p> <p>Kdy by měla být podle vás výživa zařazena do výuky během studia?</p> <p>Dokážete prosím popsat, jaké jsou největší problémy týkající se výuky výživy?</p>
4. Jak škola připravuje studenty na řešení otázek souvisejících s výživou u pacientů?	<p>Kdo, případně kolik vás vyučuje výživu na vašem ústavu?</p> <p>Jsou na vašem pracovišti členové fakulty, které lze považovat za odborníky na výživu? Víte, která témata vyučují?</p>

Hlavní dotazy	Hlavní podotázky
	<p>Jak jsou studenti školeni, aby byli schopni poskytnout radu o výživě nebo edukovat pacienta o výživě?</p> <p>Je podle vás výuce výživy věnováno dostatek času, resp. výukových hodin na LF MU? Proč ano, pro ne? Jaká témata z výživy by se měla přednášet ve výuce? Jsou tato témata zahrnutá v osnovách výuky?</p> <p>Existují podle vás nějaké možnosti, jak by se dala výuka výživy zlepšit/zkvalitnit?</p>
<p>5. Jak vnímáte úlohu nutričních terapeutů (NT) v péči o pacienta? Ve výuce mediků? V jiných oblastech?</p>	<p>Jaké služby podle vás mohou NT nabídnout?</p> <p>Jaké jsou vaše zkušenosti s NT?</p> <p>Co si myslíte o začlenění NT do výuky na LF MU pro témata týkající se výživy?</p>
<p>ODBORNÍCI s vlastní klinickou praxí</p>	
<p>6. Snažíte se začlenit výživu také do vaší odborné praxe? Jakým způsobem?</p>	<p>Doporučujete nebo odesíláte své pacienty k NT? Z jakých důvodů a za jakým účelem?</p> <p>Edukujete své pacienty o výživě/dietě nebo poskytujete jim rady ohledně výživy? Za jakých podmínek?</p> <p>Jaké edukační materiály (letáčky o výživě) nabízíte svým pacientům? Odkud je získáváte?</p> <p>Konzultujete s NT některé problémy ve výživě svých pacientů?</p>



THE UNIVERSITY of NORTH CAROLINA
GREENSBORO

Interview Guide

Participant Data Collection

Students

7. Year in medical school
8. Please specify your Nationality
 - a. Czech/Slovak
 - b. Non-Czech/Slovak
9. Gender
10. Age
11. Primary language spoken
12. In what country do you plan to practice medicine?

Faculty MD

11. Gender
12. Age
13. Please specify your Nationality
 - a. Czech/Slovak
 - b. Non-Czech/Slovak
14. Primary language spoken
15. What is your medical specialty?
16. How many years on faculty at MU?
17. What Department (s)?
18. What subject(s) do you teach? What are the specific topics you cover?
19. Do you practice clinically? Where?
20. How many years have you practiced clinically?

Faculty Non-MD

12. Gender
13. Age
14. Please specify your Nationality
 - a. Czech/Slovak
 - b. Non-Czech/Slovak
15. Primary language spoken

16. What is your specialty/area of expertise?
17. How many years on faculty at MU?
18. What Department(s)
19. What subject(s) do you teach? What are the specific topics you cover?
20. Do you practice clinically? Where?
21. How many years have you practiced clinically?

Question Guide

Students

Major Question	Major Probes
<p>1. What do you think about the role of nutrition in medical care?</p>	<p>What about the role of doctors in providing nutrition care? For what populations and/or Hospital Departments do you think nutrition knowledge is important? For the treatment of what diseases do you think nutrition knowledge is important?</p>
<p>SKIP for GRADE I, semester I</p> <p>2. What do you think about nutrition education at MU medical school?</p> <p>Grade I, Semester 1: Where do you go for more information about nutrition?</p>	<p>In courses with nutrition topics, are you satisfied with the faculty member's level of nutrition knowledge? Why or why not? Tell me about any faculty members that are enthusiastic /passionate about nutrition? In what year of study and what kind of courses do you think nutrition should be incorporated? In your opinion how much time should be devoted to nutrition education? Where do you go for more information about nutrition?</p>
<p>SKIP for GRADE I, semester I</p> <p>3. How well does MU course work prepare you to address nutrition with your patients?</p> <p>Grade I Semester 1: What nutrition topics would you like to learn about?</p>	<p>In what subjects did you learn the most about nutrition? To what extent are faculty members demonstrating how to offer nutrition counseling and nutrition education to patients? Discuss the preparation for clinical practice, is it adequate or inadequate? How do you think information about nutrition could be better incorporated into your education or clinical training? What nutrition topics would you like to learn about?</p>
<p>4. What information, resources or skills do you need to be equipped to provide nutrition related care for your patients?</p>	<p>How comfortable are you in assessing a patient's nutrition status? How comfortable are you to offer nutrition education or counselling to patients? What nutrition training do you need to be prepared to provide nutrition care to patients?</p>

Major Question	Major Probes
	What could the school do differently to ensure students are well prepared to address nutrition in patient care?
5. How do you view the role of dietitians in patient care? In medical training? In other areas?	Tell me about the services they provide? Describe your interactions with dietitians? How do you feel about having dietitians on the medical school faculty [<i>to teach nutrition topics</i>]? When would you refer a patient to a dietitian?
6. How do you see nutrition being incorporated into your future medical practice?	If you know, will you share what area of medicine you plan to specialize in?

Proposed Question Guide

Faculty MD

Major Question	Major Probes
1. What do you think about the role of nutrition medical care?	<p>What about the role of doctors in providing nutrition care?</p> <p>For what populations and/or Hospital Departments is nutrition knowledge most important?</p> <p>For the treatment of what diseases do you think nutrition knowledge is important?</p>
2. How did you gain your nutrition related knowledge?	<p>Was nutrition part of your education in medical school? What nutrition courses did you take?</p> <p>After finishing university, how have you learned about nutrition?</p> <p>Where do you go for nutrition information?</p> <p>How do you prepare to teach nutrition topics?</p>
3. What do you think about nutrition education in the curriculum at MU medical school?	<p>Do you think nutrition is adequately addressed in the classroom? In clinical training? What topics are covered?</p> <p>When do you think nutrition education should be offered to students?</p> <p>Describe any barriers to offering nutrition education?</p>
4. How well do MU classes and training prepare students to address nutrition with patients?	<p>Who teaches nutrition in your department?</p> <p>Are there any faculty members identified as experts in nutrition? what do they teach?</p> <p>How are students trained to offer nutrition education and counseling to patients?</p> <p>In your opinion is MU devoting enough time nutrition education? Why or why not?</p> <p>What nutrition topics need to be taught?</p> <p>Are these included in the current curriculum?</p> <p>What are the ways you think nutrition education can be improved?</p>

Major Question	Major Probes
5. How do you view the role of dietitians in patient care? In medical training? In other areas?	Tell me about the services dietitians provide? Describe your interactions with dietitians. How do you feel about having dietitians on the medical school faculty [<i>to teach nutrition topics</i>]?
For CLINICIANS	
6. How do you incorporate nutrition into your medical practice?	How often do you refer patients to dietitians? For what? Do you offer nutrition education or counseling to patients? For what conditions? What nutrition handouts do you offer to patients? Where do you get them? Do you consult with dietitians regarding nutrition care for your patients? Why or why not?

Faculty Non-MD

Major Question	Major Probes
1. What do you think about the role of nutrition medical care?	<p>What about the role of doctors in providing nutrition care?</p> <p>For what populations and/or Hospital Departments is nutrition knowledge most important?</p> <p>For the treatment of what diseases do you think nutrition knowledge is important?</p>
2. How did you gain your nutrition related knowledge?	<p>Was nutrition part of your education in university? What nutrition courses did you take?</p> <p>After finishing university, how have you learned about nutrition?</p> <p>Where do you go for nutrition information?</p> <p>How do you prepare to teach nutrition topics?</p>
3. What do you think about nutrition education in the curriculum at MU medical school?	<p>Do you think nutrition is adequately addressed in the classroom? In clinical training? What topics are covered?</p> <p>When do you think nutrition education should be offered to students?</p> <p>Describe any barriers to offering nutrition education?</p>
4. How well do MU classes prepare students to address nutrition with patients?	<p>Who teaches nutrition in your department?</p> <p>Are there any faculty members identified as experts in nutrition? what do they teach?</p> <p>How are students trained to offer nutrition education and counseling to patients?</p> <p>In your opinion is MU devoting enough time nutrition education? Why or why not?</p> <p>What nutrition topics need to be taught?</p> <p>Are these included in the current curriculum?</p> <p>What are the ways you think nutrition education can be improved?</p>

Major Question	Major Probes
5. How do you view the role of dietitians in patient care? In medical training? In other areas?	Tell me about the services dietitians provide? Describe your interaction with dietitians? How do you feel about having dietitians on the medical school faculty [<i>to teach nutrition topics</i>]?
For CLINICIANS	
6. How do you incorporate nutrition into your clinical practice?	How often do you refer patients to dietitians? For what? Do you offer nutrition education or counseling to patients? For what conditions? What nutrition handouts do you offer to patients? Where do you get them? Do you consult with dietitians regarding nutrition care for your patients? Why or why not?

APPENDIX C

FLYER CZECH AND ENGLISH

Version 2 April 12, 2019

RESEARCH STUDY

Perceptions of Nutrition Education for Medical Students at Masaryk University

ARE DOCTORS
GETTING
ENOUGH
NUTRITION
EDUCATION IN
MEDICAL
SCHOOL?

WE WANT
YOUR
OPINIONS!

WOULD YOU LIKE
PERSONAL
NUTRITION
COUNSEL FROM A
NUTRITION
PROFESSIONAL?

Be a part of an important research study



If you are a student or faculty member at the MU Medical School



If you have 30–45 minutes to share your views in a private interview

The purpose of this research is to assess the perceptions of nutrition education in medical school. We are interested in the views of MU students and faculty members. Information will be collected in a short, individual interview with project staff. Participants will receive an offer for 1 hour of individual nutrition counseling as an incentive for participation.

The interviews will be conducted at the MU campus at Bohunice in the Department of Public Health, A21, room 232.



Please email nutrition.education@med.muni.cz for more information

This research is supported by the grant MUNI/A/1278/2018 (Improving knowledge about health risks and benefits of nutrition, environment and lifestyle) provided by Masaryk University.

Verze 2, 12. dubna 2019

VÝZKUM

Výživa od teorie k praxi aneb jak je vnímána výuka výživy na LF MU

VZDĚLÁVÁME
LÉKAŘE V
OBLASTI VÝŽIVY
DOSTATEČNĚ?

ZAJÍMÁ NÁS
VÁŠ NÁZOR!

MÁTE ZÁJEM
O ODBORNOU
KONZULTACI
S NUTRIČNÍM
TERAPEUTEM?

Staňte se součástí důležitého výzkumu!



Jste studentem nebo zaměstnancem Lékařské fakulty Masarykovy univerzity?



Máte 30–45 min času na sdílení svých názorů během řízeného rozhovoru?

Cílem probíhajícího výzkumu je hodnocení vnímání výuky výživy na Lékařské fakultě. Zajímá nás právě názor vás, studentů a zaměstnanců Lékařské fakulty. Sběr informací bude probíhat v rámci řízených individuálních rozhovorů o délce 30 min s vedoucími výzkumu. Za váš čas a vynaložené úsilí nabízíme hodinovou odbornou konzultaci s nutričním terapeutem o všem, co vás ve výživě trápí a zajímá.

Všechny rozhovory budou probíhat v prostorách Univerzitního kampusu Bohunice, pavilon A21, místnost 232.



Neváhejte nás kontaktovat a dohodnout si termín rozhovoru na následující adrese: nutrition.education@med.muni.cz

Tento výzkum je podpořen grantem MUNI/A/1278/2018 (Prohlubování znalostí v oblasti zdravotních rizik a benefitů výživy, prostředí a životního stylu) poskytnutým Masarykovou univerzitou.

Výživa od teorie k praxi aneb jak je vnímána výuka výživy na LF MU

Perceptions of Nutrition Education for Medical Students at Masaryk University

VZDĚLÁVÁME
LÉKAŘE V
OBLASTI VÝŽIVY
DOSTATEČNĚ?

ZAJÍMÁ NÁS
VÁŠ NÁZOR!

MÁTE ZÁJEM
O ODBORNOU
KONZULTACI
S NUTRIČNÍM
TERAPEUTEM?

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APPENDIX D

RECRUITMENT EMAIL CZECH AND ENGLISH

Recruitment Email Text:

What do you think about **nutrition in medical care**?

Would you like to **voice your opinions** about **nutrition education** at MUNI Medical School?

Would you like to **receive personalized nutrition counselling** from a nutrition professional?

Do you have **30-45 minutes to share your views** in an interview at the MU campus at Bohunice?

If you are a student or faculty member at MUNI Medical School then you are invited to participate in this research study to learn about the perceptions of nutrition education in medical school.

For **more information** contact nutrition.education@med.muni.cz

The Perceptions of Nutrition Education for Medical Students at Masaryk University is research supported by the grant MUNI/A/1278/2018

Text náborového e-mailu:

Co si myslíte o **výživě ve zdravotní péči**?

Chtěli byste **sdílet názor na výuku výživy** na Lékařské fakultě MU?

Máte zájem o **odbornou konzultaci s nutričním terapeutem**?

Máte **30-45 min na sdílení vašich názorů** skrze rozhovor na Univerzitním kampusu Bohunice?

Pokud jste student nebo zaměstnanec na Lékařské fakultě MU, srdečně Vás zveme k účasti na výzkumu zabývajícím se vnímáním výuky výživy na LF MU.

Pro více informací kontaktujte vedoucí výzkumu na mailu:

nutrition.education@med.muni.cz

Tento výzkum je podpořen grantem MUNI/A/1278/2018 (Prohlubování znalostí v oblasti zdravotních rizik a benefitů výživy, prostředí a životního stylu) poskytnutým Masarykovou univerzitou.

APPENDIX E

RECRUITMENT SCRIPT CZECH AND ENGLISH

Recruitment Script

Hello, I am [Zlata Kapounová or Victoria Hawk]

I am wondering what you think about the nutrition education offered at MU Medical School?

We are conducting a research study to assess The Perceptions of Nutrition Education for Medical Students at Masaryk University.

We are looking for MU students and faculty to **voice their opinions** in a **short interview lasting about 30-45 minutes**. The interviews are **private**, and the information discussed will be **confidential and de-identified** before analysis and reporting.

If you participate, you will **receive an offer for one hour of personalized nutrition counselling** from a nutrition professional.

For **more information** contact nutrition.education@med.muni.cz

I will leave some **flyers here** with our **contact information** for questions or to get more information.

Dobrý den, jsem [Zlata Kapounová nebo Victoria Hawk]

Přemýšlím, co si myslíte o výuce výživy nabízené na Lékařské fakultě MU?

***Provádíme výzkum za účelem posouzení** Vnímání výuky výživy studentů medicíny na Lékařské fakultě Masarykovy univerzity.*

Hledáme studenty a učitele MU, kteří chtějí sdílet **jejich názory** během **krátkého rozhovoru trvajícího zhruba 30-45 minut**.

Rozhovory jsou **soukromé** a probírané informace budou **důvěrné a nepropojitelné s konkrétní osobou** před analýzou a publikováním.

Jako odměnu za účast nabízíme hodinovou osobní konzultaci s nutričním terapeutem. Pro **další informace** kontaktujte: nutrition.education@med.muni.cz

Nechám vám pár **letáků** s našimi **kontaktními údaji**, pokud máte otázky a chcete další informace.

APPENDIX F

INTERVIEW PROTOCOL

INTERVIEW PROTOCOL

Version 6 August 14, 2019

Nutrition from Theory to Practice: Perceptions of Nutrition Education for Medical Students at Masaryk University

Notetaker

Logistics, Equipment, and Resources Needed for Each Interview

Logistics/Equipment
<ul style="list-style-type: none"> • Identify next consecutive interview number • Confirm recorder is charged • Audio-recorder, microphone and holder • Prepare refreshments (water /snacks) • Laptop (Study Laptop)
Materials
<ul style="list-style-type: none"> • Copy of Interview Guide in appropriate language with Interview Number noted on front • 2 copies of Participant Consent form in appropriate language • Pen and paper • Voucher in appropriate language • Cups

Notetaker duties:

BEFORE the Interview

1. Gather and set out study documents (**Interview Guide, Information sheets/consent forms, voucher**)
2. Prepare refreshments
3. Wear **Student ID** on lanyard
4. Welcome participant when she/he arrives

DURING the Interview

1. Sit in designated location
2. Types notes and observations throughout the interview including:
 - **DO NOT** include any **IDENTIFIABLE** information in the notes (see Identifiable Info sheet)

- Did they **refuse to answer** any questions, were **additional topics** discussed, **anything unusual** occur?
 - Did they have **overly emotional response(s)** to interview questions?
 - Document specific information including:
 - Identify any **notable quotes** that show an important point of view
 - Note **key points shared** for each question
 - Are any **new concepts** identified?
 - Propose any **additional questions** to ask
3. Do not participate in the discussion

AFTER the interview

1. Save the notes file on Study Laptop (STUDY ID Notes)
2. **Clean up** refreshments, put all study materials away and get room ready for class
3. Create a **Checklist Document and Folder** for the Interview and store it in the designate location

Interviewer Duties:

BEFORE the Interview

1. Confirm day/place/time with participant via email
2. Obtain copy of **Code Ticket, Interview Guide and Participant Consent Form** in appropriate language
3. Identify next **Sequential Interview Number**
4. Prepare audio-recorder and microphone
5. **Complete code ticket:** Interview Number + Participant Type + Med School Program + Grade

PARTICIPANT CODE:			
Interview Number	Participant Type	Medical School Program	Grade
2-digit consecutive number	1- Student	1- Czech language	0 – Faculty
	2- Faculty MD	2- English language	1-6 - Student Grade
	3- Faculty Non-MD		

6. **Start recording** and speak **Participant Code**
7. **Pause** audio-recorder
8. Offer refreshments to participant

DURING the Interview

1. Welcome participant
2. Ask Czech/Slovak participants to use **FORMAL language** during interview.

3. Review **Participant Consent Form** and obtain signed **consent** from participant
4. Follow **Interview Guide** to obtain **Demographic Information**
5. **RE-START tape recorder** after obtaining demographic information

6. **Manage Interview**
 - a. **Summarize responses** to transition to next question
 - b. **Pause** to allow participant time to consider answers
 - c. **Remain NEUTRAL - Do NOT** offer any **affirmations or verbal agreement** with responses
 - d. **Probes**
 - i. Would you explain further?
 - ii. Will you give me an example?
 - iii. I don't understand
7. **STOP audio recorder** after completion of last question
8. **WRITE voucher code on Code Ticket**

Voucher Code:

Date:

Signed:

9. **WRITE** Date and Signature on **VOUCHER**
10. Finish by giving **VOUCHER** to participant and explaining how to redeem

AFTER Interview

1. **WRITE Participant Code** on **Participant Consent Form** and **Interview Guide**
2. Login to BOX
3. **Connect the audio recorder to the PC**
 - a. Copy file to **folder on BOX**
 - b. **Rename** file: Participant Code Interview (e.g., 01125 Interview)
 - c. **Confirm** that **audio file** is working
4. **Delete** the audio recording file from recorder
5. **Access** the **Interview Notes** file on the study PC
 - a. **Copy** the notes file to designated location on BOX
 - b. **Rename** the file **Participant Code Notes** (e.g., 0112Notes)
 - c. **Delete** the notes file from the study PC

6. **Prepare file for transcription**
 - a. transcription
 - i. EN – send to Temi
 - ii. CZ – notify students that file is ready for transcription

7. Add **Voucher Number** and date to **Voucher Log** on Box

Welcome

Good [morning, afternoon, evening], my name is [Zlata/Victoria] and I am XX and will be conducting the interview today. Thank you for coming and I want to hear your opinions and viewpoints. This is Veronika, she is a student member of the research team and will be taking notes today. What questions do you have before we begin?

PREPARATION for the INTERVIEW

1. Give participant a copy of the **Information for Participants in Research** to review.
 - This document provides some information about our study and we can review it together. This is your copy to keep.

The AIM of the PROJECT

- We are interested in identifying and describing the views and experience of students and faculty members regarding nutrition education offered at (MU) medical school as well as their perceptions of dietitians and any barriers to nutrition education.
- The results will be used to improve nutrition education at MU and to promote nutrition care for patients.

The RESEARCH TEAM

- This is an international collaboration between MU Dept of PH and UNCG Dept of Nutrition. The Lead researcher is Dr. Zlata Kapounová and her contact email

FUNDING and DURATION of the PROJECT

- This project is supported by MU and we plan to conduct interviews through December 2019.

COLLECTION of INFORMATION

- The Interviews are with students and faculty members from the MU Medical School and last approximately **30 minutes**
- We would like to **record the interview** so we don't miss any information you share – **is this OK?**
- **Before we analyze** the interview, we will review the transcript and **remove any personal and identifying** information
- Your **participation** in this study is **voluntary**
- **During the interview** I will ask you some questions, but you can **refuse to answer any questions**.
- You can **interrupt or finish the interview** at any time.
- You can **ask questions about the research** or **withdraw your participation** in the study.
- **After the interview** you can contact Dr. Kapounová to withdraw, **change or delete any information** discussed during the interview.

- Your **privacy is important** and the data from the study is **stored securely**. The record of the interview will be **stored for 5 years** and the **transcripts indefinitely**, unless otherwise specified.

Additional PROBLEMS with participation in the research

- If you have any concerns about the research and don't want to contact our research team, you can contact someone responsible for participant's privacy at MU.

What QUESTIONS do you have?

Obtain written CONSENT

1. Now I would like your **written consent** to participate in the project
2. Review the **Consent Document**
 - I would like you to complete the consent document to confirm you understand what we have discussed about the study.
 - Participant can **read and review**
 - **Write your initials** in **each box** to confirm agreement with the statement

CONDUCTING the interview

1. **Occasionally verify the audio recorder is working - note SOLID red light** on front.
2. Ask **one question** at a time.
3. **Ask Czech/Slovak participants** to use **FORMAL** language.
4. **Attempt to remain as neutral as possible.** That is, don't show strong emotional reactions to their responses.
5. **Encourage responses** with occasional nods of the head, "uh-huh"s, etc.
6. **Summarize responses and use probes to obtain more information**, e.g., so you've said that you are ... so what about XXX
7. **Don't lose control of the interview.** This can occur when respondents stray to another topic, take so long to answer a question that time begins to run out, or even begin asking questions to the interviewer.

Follow the Interview Guide

1. **Let's start** by getting some **information about you....**
2. **RE-START Audio Recorder AFTER demographic information**

Complete Interview Questions

1. Thank you for sharing your opinions about nutrition education
2. Is there anything that we did not ask about that you would like to share?
3. Thank you for your participation

STOP the audio recording

Offer VOUCHER to Participant

1. Thanks again for your participation
2. Add **Voucher Number** to **Code Ticket**
3. Sign and write date on **voucher**
4. Give them a copy of the **Voucher** for Personal Nutrition Counseling
5. Review voucher
 1. This voucher is for 1 hour of nutrition counselling at the clinic on campus
 2. Identify **email contact** to schedule appointment
 3. Need to **complete visit before the end of 2019.**

CONCLUDE Interview

1. What additional questions do you have?
2. Thank you for your participation

APPENDIX G

TRANSCRIPTION PROTOCOL

Transcription Protocol:

Czech interviews

1. Obtain specific audio recording from Investigator
2. Create folder on desktop. (Copy MP3 file and a blank Word document in folder)
3. Load recording into **OTranscribe** program (Google search: Otranscribe)
4. Put on Headphones
5. Note interview number from audio file: #####Interview (06224 Interview)
6. Open the Word document in the folder – save as ##### **Transcription**
7. Begin playback and transcription in OTranscribe program
8. Every 5 minutes - copy text to Word document and save
9. When finished, add **Page numbers, save document** and **let investigator know** and she will come to review file.
10. Complete entry in the **Transcription Log**
11. **Investigator** will log into BOX and copy file of transcription and will copy file of transcription to backup location
12. **Investigator** will delete files from desktop

Common Questions:

Q – How do I identify WHO is speaking in the transcript?

Each time a new person speaks, start transcribing on a new line

Interviewer in BOLD text, Interviewer Z

Participant in NON-BOLD text Participant#####

Q – How do I transcribe when interviewer says “mmm” during the interview

DO NOT transcribe “mmm” when it **interrupts the flow of the subject’s answers**

DO NOT transcribe “mmm” when it is said **before the interviewer asks a question**

Q – How do I transcribe Laughter

You can transcribe as [Laughter]

Q – What happens if I cannot understand what is said?

Note this as **[inaudible]** in the text, and include a **TIME STAMP** from the audio file.

I do not like to hear about (inaudible) when I attend class. 5:36

Q – What do I do when the interviewer interrupts the participant, or the participant interrupts the interviewer?

You note the interruption with marks “...”

So what you are saying is that you went ...

I went to class

... to class on Monday?

Q - How do I transcribe a long pause

You transcribe it as [pause]

Data De-identification Protocol

May 13, 2020

This is a process that PI's will use to prepare transcripts for translation and analysis.

1. Remove **stalling** words
 - um, ah, so, uh, hm, hm
 - tak, yo
2. Add **[pause]** to note any pauses in conversation
3. Remove **duplicate** words
4. Remove **words and expressions that don't add meaning**
 - Fair enough, Yeah, Wow, like, yep, you know, okay
 - Takže, Vlastně, jakoby, prostě, jako, no, teda, že, jo, právě, třeba, ten, ta, to, ty, toho
5. Deidentify text by replacing **identifying words**
 - Participant's name – replace with [Name]
 - Participant's country – replace with [Country]
 - Participant's language – replace with [Language]
 - Participant's education – replace with [Education information]
 - Participant's personal information replace with [Personal information]
 - Course names replace with [Course name]
 - Faculty Name replace with [Faculty Name]
 - Faculty working place replace with [Faculty working place]
 - Religion – replace with [Cultural customs]
 - Disease – replace with [Disease name]
 - Family member – replace with [Family]
 - Friend's name – replace with [Friend]
 - Health Condition – replace with [health condition]
 - Medical Specialty – replace with [medical specialty]
 - Treatment name – replace with [treatment name]
 - Hospital name – replace with [hospital]
 - University name – replace with [university]
 - Year – replace with [year]
 - Participant's region – replace with [year]
 - Interviewer name – replace with [interviewer]
6. Replace sound of **laughter** with [laugh]
7. Note any **interruptions** with [interruption by]
8. Add information to help clearly explain answers – (include details in **parenthesis**)
9. If there is an unfinished sentence – use “...” to reflect incomplete thought
10. **CZ Only – Correct word order** to make meaning clear, improve sentences to make document ready for translation
11. **CZ Only – Add words** to improve readability of text, make meaning more clear and easier to read. **Put added words in parenthesis ()** This is needed to account

for differences in Czech/Slovak languages that may confuse meaning of interviews.

12. **CZ Only - Finish sentence If it is not complete**, add words to provide meaning based on context [e.g. informal versus formal language] **Put added words in parenthesis ()**

APPENDIX H

DATA ANALYSIS PROTOCOL

Data Analysis Protocol

The purpose of this protocol is to outline the process used for analyzing the interview data including coding and determining themes. The following team members participated in the data analysis:

- ZK – Zlata Kapounová, Co-Researcher
- VH – Victoria Hawk, Co-Researcher
- VS – Veronika Spáčilová, Research Assistant
- LH – Lauren Haldeman, Faculty Advisor

Abbreviations: EN = English language CZ = Czech language

First Pass – Identify ideas and develop codes^{1,2}

- GOAL - Read interviews without thinking about the research questions. In other words, don't restrict thinking or have preconceived ideas.
- We prepared a schedule for our review of the interviews.
- Independently ZK and VH read each transcript and identified key words and phrases, main ideas and recurring thoughts that captured important aspects of the data
 - EN Interviews – both researchers reviewed EN transcript.
 - CZ Interviews – ZK read transcript in CZ and VH and ZK read CZ transcript that was translated into EN.
- Independently and during the process, VH and ZK wrote summary memos to document main ideas, ideas, thoughts, and reflections.
- VH and ZK met to compare and discuss findings and reach consensus about the interview ideas. We developed codes. During our meetings reviewed up to 3 interviews at a time.
- We followed this process for all 36 interview transcripts.
- When the First Pass was completed for all interviews, we met with VS to review findings, code book, and compare with her interview notes. We discuss each interview that she attended to determine if she had other ideas or information to consider.

Prepare Code Book^{3,4}

Definitions:

Code: a label attached to a specific piece of data

Code Book: VH edited the code book, and was responsible for its creation, as well as making updates, and revisions.

Deductive Codes: Codes that are developed from ideas predetermined before data collection.

Inductive Codes: Codes that are developed from new ideas in the data

VH and ZK:

- During the First Pass review we developed our **Code Book** in English including **INDUCTIVE and DEDUCTIVE codes** that emerged during the process. Some codes were directly related to the interview guides, research questions, conceptual model and literature review (deductive) prepared for this study, while others emerged from the data (inductive). VH created and maintained the code book.
- VH and ZK reached consensus on all codes included in the code book.
- The Code Book was reviewed with VS and LH and finalized with 64 codes in 23 categories (code groups, including 42 deductive and 22 inductive codes).
- VH and ZK confirmed that all questions on the interview guides are represented in the codes (e.g., deductive codes).

Second Pass – Coding Transcripts

- VH added transcripts and code book into Atlas.ti 9.
- VH coded all transcripts in Atlas.ti 9.
- VH discussed coding with ZK and made minor updates to code book as needed for any changes or edits noted during coding.

Theme Development^{3,5}

Theme – label that summarizes the meaning of a group of related codes

- VH conducted thematic analysis of the transcript data.
- Transcripts were coded in the order of collection. Each transcript reviewed at least twice to confirm code selection.
- Each transcript and first pass notes from VH and ZK were read again and a document was that identified the main ideas.
- Information in this document was grouped by listing main ideas and related codes into overarching themes.
- A Thematic Map was developed to identify and group major themes, sub themes and related codes.
- Each major theme was assessed to review associated groups of codes and to confirm sub themes and identify consensus of ideas. The thematic map was refined as notes were reviewed.
- Using atlas, all quotes were identified and reviewed for each code included in the thematic map. All quotes were reviewed to confirm main ideas and identify representative quotes.
- A Theme Summary (see Appendix X) was developed to include main themes, sub themes and document details of the coded data.
- The code book was reviewed and compared with the theme summary to identify other codes that may relate to a theme or subtheme. (Theme Summary includes 59 of 64 codes)

- Atlas was used to identify and review quotes for any additional codes. Themes, sub themes and details were updated on the Theme Summary as indicated to reflect the results.
- The Theme Summary for the project data was reviewed and approved by ZK and LH.

Additional Notes on Theme Saturation and Reporting⁶

- Although the study was not designed to be comparative, when applicable I assessed the frequency of selected ideas as per discussion with LH.
 - *This topic was critical for most, only a few etc.*
 - X participants expressed interest in this topic.
- We were unable to assess theme saturation during data collection as this occurs in an ideal setting.
 - We enrolled our study participants in groups due to availability during the semesters.
 - With interviews conducted in two languages, translation was essential for reviewing these transcripts by both researchers. The process of transcription and then translation was time consuming and thus occurred weeks or months after the interviews were completed.
 - We had limited resources to transcribe and translate interview data and thus could not review and analyze data in real time during the recruitment process. This made it impossible to assess saturation in real time.
 - We have a preliminary analysis of 10 interviews conducted in September 2019 that identified similar themes that are consistent with those determined at the end of study, suggesting that no new themes were identified, and saturation occurred.
 - As the first assessment of this kind in the Czech Republic, we successfully recruited a convenience sample from all grades in both the EN and CZ language programs in an effort to obtain a wide variety of responses.

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APPENDIX I

CODE BOOK

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
Nutrition role	1	Nutrition role in Medical Care	Opinion on the importance about the role nutrition for medical care and in medicine.	Huge and very underestimated, prevention is possible with nutrition. Treatment will be poor quality, for some medical treatments nutrition is the cornerstone		
Nutrition role	2	Nutrition role in Health	Opinion about how food and lifestyle impact health	We can't just life on medication and some supplements, we have to take care of ourselves. Lifestyle, prevention, food choices, people who are not nourished, people are confused about diets		
Nutrition role	3	Diseases that Nutrition plays a big role	This identifies any diseases named including lifestyle diseases for prevention, management, treatment	Diabetes, obesity, anorexia		
Nutrition role	4	Hospital Departments where nutrition is important	This identifies hospital department where nutrition should play a role (theoretically)	Oncology, GI,		
nutrition role	5	What groups of people or populations is nutrition important?	What groups in the population is nutrition most important for? Different ages and global groups	Medical students, children, Global problem, people in role model positions, teachers		
Food	6	Hospital food/diets	Options or information about the food offered to patients in hospitals	I saw what patients in most hospitals were getting, just the quality of the food is . . . If the food		

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
				isn't tasty the patient may quit eating, hospital food provided is poor and there would be a big impact if money was invested in nutrition therapy		
Food	7	Czech Food	Typical foods (food and drinks) that are part of the Czech diet and culture		Not opinion about food in CR	
Food	8	Czech Food—History	Opinion on food in the Czech Republic (and history of food)		Not typical Czech foods	
Food	9	Foods available/offered on Campus/Food stores in Czech Republic	Opinion about food options on campus (canteen, vending machines, etc.)	Promote healthier foods in vending machines		
Food	10	Personalized nutrition	Diet is customized for each person, individualized care	Diet should be adjusted and personalized	This is not Personal Nutrition	I would like to know more about how I can eat healthy as a student
Lifestyle	11	Physical activity	Opinion on the amount of physical activity by people (in Czech Republic)			
Hospital	12	Hospital Departments and nutrition—reality	Identifies opinions about the actual view of nutrition in hospital departments			
Doctors role	13	Doctor's role in providing nutrition care	Opinion about the role of doctors to provide nutrition care to patients	Doctor should not provide wrong advice, Doctors should be a role model for patients, need to be aware of influences of certain types of		

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
				diets, I would gladly involve nutrition aspects, Educate and instruct people before the onset of disease, we cannot preach water and drink wine, it should be discussed with a lot of emphasis		
Interdisc. care	14	Interdisciplinary care between doctor and dietitian	Opinion about doctors working together with dietitians	Working hand in hand is in the patient's best interest, Doctors can't do it alone, communicate with doctors about what type of diet, Make the case to show doctors that diet is really important		
Dietitian role	15	Perceptions about the role of dietitians	Do they know what a dietitian does	Dietitians are playing a very preventive role		
Dietitian role	16	Role of dietitians on medical school faculty	Opinion about the role of dietitians as faculty members	Basic information if not for medical students then allied health students		
Dietitian Role	17	What is the role of dietitians in the hospital	What roles are identified for dietitians that work in hospitals			
Dietitian experience	18	Personal experience with a dietitian	Did the student have any experience working with a dietitian personally including friends, family or during clinical experience.	Family member had nutritionist for a while and relayed information to me, I had an intolerance and talked to a doctor and a dietitian	NOT professional experience with a dietitian during volunteer, work or clinical study in health care setting	
Dietitian experience	19	Professional Experience with a dietitian while	Did you work with or see any dietitians in the clinical setting during	I never saw a dietitian in the hospital, I've seen them in the hospital, but I haven't had a deep conversation with them	NOT personal experience with dietitian	

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
		working in a clinical setting	work, volunteer or clinical experience?			
Perceptions about Dietitians	20	Perceptions about the dietitian's level of nutrition knowledge	What opinions do medical students or faculty have about the nutrition expertise of dietitians	There are better experts in nutrition, they are not experts		
Perceptions about Dietitians	21	Students don't know name of dietitian profession	The medical student is not familiar with the term dietitian as a profession	How are they called? So the nutrition therapist, I understand there are some people that are educated in nutrition		
Curriculum	22	Perceptions about current nutrition education for medical students	Opinions about nutrition teaching at MU medical school and importance of nutrition in medical school	Emphasis is on the theoretical knowledge and mostly unnecessary. Not a priority to study nutrition. Offer the correct nutrition information. Suggestions for practical lessons. No test questions/Nutrition not emphasized on exams; no demonstrations or practical information, missed opportunity they could have made. Nutrition is never a real topic. Too little	Not the education system for medical school	
Curriculum	23	Perceptions about current education system for medical students	What do students think about the current system for education at medical school	A lot of teaching is basically this we start at 7:30 and finish at 12:30 and teaching is only lectures	NOT Nutrition education	
Curriculum	24	What courses give the most nutrition information	Which courses in the MU curriculum offer some information about nutrition	Public Health		
Curriculum	25	When should nutrition	What grades in the medical school should offer nutrition	What grades. Timing is the beginning of the semester, The		

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
Curriculum	26	Curriculum - Should nutrition course be obligatory or non-obligatory	education. When should it be included? Should a nutrition course be required?	sooner the better. After subject with theoretical knowledge		
Curriculum	27	What is the optimal amount of nutrition education (lessons) in medical school	15 hours, one semester, one block			
Curriculum	28	Should the school offer a separate course in nutrition?	Opinion about the need to have a separate nutrition course			
Curriculum	29	In what courses would you like more nutrition information	Name of subjects where more nutrition information should be included.	Clinical courses, Biology - didn't really go into how to keep a healthy microbiome, we needed more details	This does not include Nutrition TOPICS of interest	Supplements, personal nutrition, sports nutrition
Curriculum	30	Nutrition Topics of interest	What topics would you like to learn about or what skills would you like to learn.	I am interested in vitamins and minerals (supplements), biochemical, theory to practice, hospital diets, microbiome	Not Nutrition Assessment, Not Anamnesis, Not course names	
Enthusiasm	31	MU Faculty emphasis and enthusiasm for nutrition education	Does the faculty emphasize nutrition education for students. Is nutrition on the tests. Is nutrition discussed during clinical care	Faculty member is passionate about nutrition. There are no test questions about nutrition, there is too little nutrition		

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
Enthusiasm	32	MU Student enthusiasm for nutrition subjects in courses where nutrition is included	Do students give same emphasis to nutrition topics, I have more interest in nutrition now than before,	As a student I'd rather do less work on (nutrition)		
Education methods	33	Student opinions about Preferred methods of education about nutrition	What methods can faculty use to education students about nutrition	Observe dietitians doing nutrition assessments, Case studies, cooking lessons, model situation, in-person education, role play, demonstrating is the best way to learn, Lectures from Dietitians, incorporated in a way that people would be enthusiastic, it should be practical, provide written materials to read at home	This does not include detailed case study information	
Skills needed	34	What practical skills and information about nutrition are needed for medical practice	What are the skills and resources needed to help you incorporate nutrition in your medical practice? What education can medical school give you?	Communication skills, nutrition questions, patient handouts, nutrition basics, shadow dietitian, good internet sites, good app's, how to educate patients, Biochemistry & metabolism knowledge to know how the organism works, gradually set up (diet) something that works for the patient, provide information as a starting point	NOT anamnesis	
Personal Nutrition	35	Personal impact of nutrition	How does personal nutrition care/knowledge affect students. Personal experience with diets, desire to help self	Nutrition affects me because it is what I eat as well, I tried to be a vegan for a few months but had a health problem, I pay attention to nutrition because a family member has a therapeutic diet	Not personalized nutrition	
Personal Nutrition	36	Dietitian visits for students	Medical students are given opportunity to	Observation of practice, personal nutrition advice, Medical students		

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
			visit a dietitian for personal counseling	have so much pressure it's important to have a healthy diet		
Personal Nutrition	37	Barriers to Healthy Eating for students and the population	Identifies problems that medical student report regarding following a healthy diet	You can easily forget to eat, student doesn't know how to cook, people are confused about their diet		
Dietitian referrals	38	Dietitian Referral	Would doctor make a referral to a dietitian and for what reasons?	I would advise (patient) to go to someone more specialized, diet education is relevant to the entire population, I would do anything to help my patients		
Dietitian referrals	39	Barriers to dietitian referrals	What are the reasons that doctors do not make referrals to dietitians	It could make things easier but is not professional		
Case study	40	Case Study	Specific reference to case study relating to nutrition	Specific details - clinical information about a case, too much caffeine, older people don't drink milk	This is NOT the desired methods of education	
Future Practice	41	Plan for Future Practice	What type of medicine does the medic think they will practice			
Future Practice	42	Plan for role of nutrition in future practice	What does the student think about the role of nutrition in future practice	Talk about diet during initial anamnesis (history)		
Nutrition Education	43	Student reports Nutrition Education prior to medical school	Did the student report any nutrition education in high school, through family members, or by visit to dietitian?	My high school teacher was very interested in nutrition so we learned about it in our classes, my family had experience with dietitian and relayed it to me, my parents taught me about nutrition		
Nutrition Education	44	Perceptions about nutrition	Opinion about the nutrition education at	I know that medical schools in my country.... Students from other		

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
		education at MU vs other medical schools	MU as compared to other medical schools	universities have multiple choice exams (not live) and their knowledge is even better		
Nutrition Education	45	Barriers to learning nutrition in medical school	What are some of the things that can reduce a student's interest in learning nutrition in medical school	If it was about how you would advise someone else then students may take it more seriously. Volume of information in medical education, not emphasized by faculty. Tests don't have many nutrition questions; I don't have any nutrition textbook, not on test so I didn't read it		
Resources	46	Institute of Modern Nutrition	Note anyone that mentions IOMN	I went to the lecture on campus by the IOMN	ONLY IOMN	
Resources	47	Where do you look for and learn about nutrition information	Sources used to find information about nutrition	I'll go straight to Google. I have a friend studying in the dietitian program, I watch the show "you are what you eat"	NOT Institute of Modern Nutrition	
nutrition attitude	48	Student Perceptions about nutrition	What attitude is expressed about nutrition	"it's not a field of interest," we want to be doctors not nutrition specialists, should be presented in a way that people will be enthusiastic, I will be glad about any topic related to nutrition		
Clinical nutrition	49	Perceptions about nutrition in clinics or clinical practice	Medical students and Faculty MD experience or observations about nutrition in the clinical setting	in clinic we see people that people didn't care about nutrition for years, Weight may fluctuate and GP doesn't address it at all, my pediatrician took it seriously so I thought it was very important		
clinical nutrition	50	Anamnesis	Is nutrition information included	I don't know what questions to ask / how to use medical record		

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
Clinical Nutrition	51	Barriers for doctors to offer nutrition care	What are the things that prevent a doctor from giving nutrition care	Doctors need more training to be confident to give nutrition advice, perform nutrition assessment, I think in the CR Doctors don't interfere much nowadays		
clinical practice	52	Med School Preparation for nutrition in clinical practice	What is opinion about how well the program prepares students for NUTRITION ISSUES in clinical practice	As far as I know, in the plans, we have no nutritional advice. They prepare us to have at least some minimum or at least average knowledge about it, Examine the body looking for signs of nutrition status, like how does it help the patient in daily life? we learn this stuff in theory in Dept of PH, but we don't see this in practice		
Clinical practice	53	Medical students' confidence about Giving nutrition advice	What is their opinion about confidence level to give advice, or if faculty teach them how to give advice or model behavior assessment	I wouldn't dare give a patient too much nutrition advice; other people say you should eat this way, but I'm really confused by what is the proper way		
Nutrition Knowledge	54	Medical students' confidence about nutrition knowledge	How confident are the medical students in their knowledge of nutrition	I'm really confused about what is the proper way, maybe this is not a general consensus of what one should eat and not eat		
Nutrition Knowledge	55	Perceptions about the doctor's level of nutrition knowledge	What are the student perceptions about the how much nutrition knowledge doctors have	In my country, the doctor doesn't know nutrition, as a doctor I'm not going to be the person people will ask questions about nutrition		
Nutrition Knowledge	56	Nutrition literacy/level of knowledge	Nutrition Literacy is knowledge of nutrition principles and skills in food-related tasks	People aren't educated on nutrition, yes I think we can do much better when it comes to education on nutrition people from lower SES		

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
				have not rec' knowledge about the role of diet		
Nutrition Knowledge	57	Student perceptions about faculty knowledge about nutrition	Does the MU Medical Faculty have adequate knowledge about nutrition topics – include department/ willing to include much information	Theory is great, but we don't have any practice (practical), I was not satisfied with the Faculty's level of nutrition knowledge		
Nutrition Knowledge	58	False beliefs or wrong information about nutrition	What do students say that is not correct about nutrition	Doctors can quite quickly determine if a patient is eating correctly or not, Dietitian needs to adjust diet		
Curriculum	59	Nutrition topics in lectures	How do faculty report incorporating nutrition information into lectures?			
Nutrition Knowledge	60	Faculty nutrition knowledge	How and where do faculty report learning nutrition knowledge			
Curriculum	61	Barriers to including nutrition in lectures	Faculty identified barriers to including nutrition information into courses	Limited lecture time, not willing to take time to update slides		
Curriculum	62	Barriers to teaching nutrition topics	Faculty Identified barriers to teaching nutrition in medical school	Very few teachers with clinical experience, textbooks are expensive		
Curriculum	63	Nutrition topics included in lectures	What nutrition topics do faculty report including in their courses?	When a patient has a deficiency or an excess		

THEME Group	Code Number	Code name	Definition	Representative Quote	Exclusion Criteria	Representative quote for exclusion
Curriculum	64	Faculty member's suggestions for improving nutrition education in medical school	Ideas for ways that nutrition can be included in medical school education	You have slides, video or something extra to identify the importance of nutrition		

APPENDIX J

THEME SUMMARY

Theme Summary Ver 10

Jan 24, 2021

Theme	Sub Theme/Code Group	Codes	Main Ideas from Interviews
1. Nutrition in medical care and health	1. Importance of nutrition <i>Important and essential</i> <i>Important for many groups including students</i>	1. Role of Nutr in Medical Care 2. Role of Nutr in Health 3. Diseases where Nutr plays big role 4. Hospital Dept's where Nutr is imp 5. What Populations or groups is Nutr imp?	<ul style="list-style-type: none"> • Important, significant, preventive. treatment • Without proper diet you can't have proper med • One of the most important parts • Pediatrics • Pregnant and lactating women • Mothers and parents • Geriatrics/older adults • Medical students
	2. Doctor's role in providing nutrition care <i>Role model,</i> <i>Offer Education,</i> <i>Correct advice</i> Referral to dietitian	13 Doctor's Role 12 Hosp dept's and nutr – reality 38 Dietitian referrals 39 Barriers to dietitian referrals 49 Nutr in Clinical practice – reality 51 Barriers for doctors to offer nutrition care	<ul style="list-style-type: none"> • Doctors need to promote nutrition • Doctor as a role model for patients • Give advice, but not wrong advice • Referrals to dietitian • Not all doctors educated in nutrition
2. Nutrition education in the current curriculum	1. General education focusing on theoretical information <i>Good theoretical info</i> <i>Limited practical information</i>	22 Percept about current nutr ed for MS 23 Percept about current ed system for MS 44 Perceptions about nutr at MU vs other schl 45 Barriers to learning nutrition in MS 61 Barriers to including nutrition in lectures 63 Nutr topics included in lectures	<ul style="list-style-type: none"> • Good basic knowledge • The school does not prepare us for the practical problems at all. We have some theoretical background but practically (in reality) we know nothing 3 • Emphasis on theoretical knowledge

Theme	Sub Theme/Code Group	Codes	Main Ideas from Interviews
	2. Limited emphasis on nutrition topics <i>Enthusiasm in certain subjects Not a priority Only briefly discussed, if at all Not tested Limited resources</i>	31 Faculty Emph & Enth for nutrition ed 32 Student enth for nutr subjects in courses 24 What courses give you the most nutr info 26 Should nutr be obligatory or non-oblig 27 What is the optimal amt of nutr ed 42 Plan for role of nutr in future practice 43, 48, 57, 59, 60, 62	<ul style="list-style-type: none"> • Timetable is crammed – no space for additional topics • Importance of Nutrition is underestimated 33 • Enthusiasm for other subjects, nutrition not a priority in any subject • Nutrition not included on tests More emphasis on rare virus than on nutrition 34 • Teachers not willing to spend time updating presentations • Don't get good materials to read at home
	3. Preparation for clinical practice <i>No demonstration from faculty Students lack confidence offering nutrition education and advice Not emphasized with patients Anamnesis nutr questions optional Nutrition not discussed in clinic</i>	52 MS preparation for nutr in clinical practice 51 Barriers for doctors to offer nutrition care 53 Medical Students confidence about giving nutrition advice 54 Medical students' confidence about nutrition knowledge 55 Perceptions about doctors' level of nutrition knowledge 46 Institute of Modern Nutrition 47 Where do you look for and learn about nutr 50 Anamnesis	<ul style="list-style-type: none"> • Clinical years: "I have not seen any emphasis given by the doctor to the patient upon nutrition." 03 • We had some patients with special nutr requirements and saw it in practice in ICU • Don't know how to use knowledge or explain it to a patient • Not comfortable, not confident, not equipped • Too few clinicians on faculty • No demonstration from faculty • Never seen doctor emphasize nutrition w/patient • Anamnesis doesn't ask much about nutrition • In clinical internships we don't discuss nutrition • No, they (students) don't have sufficient training. They have just some imagination of that nutrition

Theme	Sub Theme/Code Group	Codes	Main Ideas from Interviews
3. Role of dietitians in medical care and education	1. Limited awareness and interaction in the clinical setting	12 Hosp dept's and nutrition – reality 15 Role of Dietitians 17 Role of Dietitians in hospital 18 Personal experience with a dietitian 19 Prof experience with a dietitian 20 Perceptions about dietitians' level of nutrition knowledge 21 Students don't know the name of the profession 49 Nutrition in Clin practice - reality	should be solved but don't know exactly 33 <ul style="list-style-type: none"> • Not met dietitian in hospital 20 • Don't know how dietitian works 1 • Should be Used more in hospitals 3 • Very beneficial profession 2 • Important, Significant • Educated in nutrition, can be helpful for patients and offer more information that doctors 22 • Not respected or considered part of the healthcare team in CZ 30 • I would love it if there were a position like Junior Dietitian and then Senior Dietitian 36
	<i>Limited awareness about dietitians</i> <i>Very beneficial profession</i> <i>Not aware of role in hospitals</i> <i>Not respected on healthcare team</i> <i>More nutrition knowledge than doctors</i>		
	2. Role on the medical school faculty	16 Role of Dietitians on Faculty	<ul style="list-style-type: none"> • Supportive • Enhance our knowledge on nutrition 29 • No one better to lead 27 • Learn more about a health profession with nutrition knowledge 04 • Beneficial to learn from those with practical experience
	3. Importance of interdisciplinary care	14 Interdisciplinary care between doctor and dietitian and other health professionals	<ul style="list-style-type: none"> • Most think cooperation is beneficial for doctors and patients 5,15 • Referrals or consults when doctors are not sure about nutrition advice needed 36, 28 • One student prefers to rely on his own knowledge 6
	Cooperation is beneficial and practical		

Theme	Sub Theme/Code Group	Codes	Main Ideas from Interviews
4. Opportunities for nutrition education in medical school	1. Student interest in personal nutrition for self-care <i>Students are interested in learning how to cook and eating well MS is stressful, need to eat well</i>	35 Personal Impact of Nutrition 36 Dietitian visits for students 37 Barriers to healthy eating for students and the population 9 Food available on campus	<ul style="list-style-type: none"> • Nutrition for self-care, meal planning (13) • Students are busy, stressed (7) • Learn to take care of self and others (6) • Opportunity for Dietitian visit helpful (2) • Limited time, money, cooking skills • New to CR, away from home first time
	2. Interest in more practical education and training <i>Practical education including current topics Preferred Education Methods Faculty Suggestions for improvement</i>	30 Students Nutrition topics of interest 33 Preferred methods of education 34 Practical skills and info needed for medical practice 64 Faculty Sugg for improving nutr ed in ms 25 When should nutr education be offered 27 What is the optimal amt of nutr ed 28 Should the school offer a separate nutrition course 29 In what courses would you like more nutrition information	<p>5 Most Prevalent Topics</p> <ul style="list-style-type: none"> • General Nutrition (19 students) • Popular Diets (14 students) • Meal Planning and Cooking skills (13 stud) • Therapeutic diets for disease mgt (12 stud) • Sports nutrition and exercise (4 students) • How to give advice, educate, assess nutrition status • Observe case studies and see how they are treated – diabetic, high cardiovascular risk • Standards or guidelines that are useful • Know basics of nutrition • Resources – apps or internet pages • General diet recommendations • Inform faculty about specializations of students so content can be tailored

Theme	Sub Theme/Code Group	Codes	Main Ideas from Interviews
			<ul style="list-style-type: none">• Well planned case studies w/good and poor nutrition• Full semester course with exam• Emph whole regimen for treatment meds & nutrition• Practical education with continual updates

APPENDIX K

EFAD POSTER

Perceptions of Nutrition Education and the Role of Dietitians at a Medical School in the Czech Republic: Preliminary Results



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INTRODUCTION

- The WHO estimates that 70% of deaths worldwide are related to noncommunicable (chronic) diseases with modifiable risk factors including unhealthy diet.¹
- Evidence supports that nutrition care is important for the prevention, treatment and management of many diseases and conditions.²⁻²
- Medical doctors are a trusted source of health information,^{3,4} but many do not advise patients about nutrition.⁵
- Most medical schools worldwide do not offer the recommended amount of nutrition education to students.⁶
- Medical schools in the Czech Republic are not represented in published research on this topic.

Research Question:

What are the perceptions of nutrition education and the role of dietitians at a medical school in the Czech Republic?

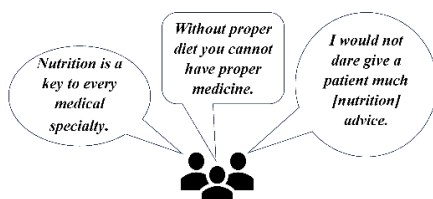
METHODS

- Qualitative, cross-sectional study.
- Semi-structured interviews with medical school faculty and students in all grades (1st-6th).
- Interviews conducted in the Czech or English language.
- Interview data transcribed, translated and analyzed.

PRELIMINARY RESULTS

- 32 interviews completed (29 students/3 faculty).
- Preliminary analysis includes 10 interviews.
- Data collection and analysis is ongoing until theme saturation is achieved.

What are perceptions about nutrition education?



What are perceptions regarding the role of dietitians?

For some chronic diseases, I think the dietitian is more important than the doctor.

Dietitians have a role in medical training.

I think their role is important, but honestly, I do not know exactly how dietitians work and what they do..



Emerging Themes

Nutrition is important in medical care

Students want nutrition education on current topics

Students lack confidence offering nutrition education to patients

Participants have limited awareness about the roles of dietitians

PRELIMINARY CONCLUSIONS

- Participants recognize the important role of nutrition in medicine but need additional education and training to include nutrition in medical care.
- By expanding the nutrition education offered to medical students, there are opportunities to promote cooperation with dietitians and improve patient care.

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