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Original article

Student and faculty perceptions of nutrition education in medical school

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SUMMARY

Background & aim: There is abundant evidence to support the beneficial role of nutrition in the prevention, management and treatment of many health conditions including non-communicable diseases and malnutrition. Despite the increasing prevalence of these conditions around the world, research over the past decades has identified that many medical schools lack adequate nutrition education and training for medical students. With the Czech Republic not represented in these findings, this qualitative study aimed to assess and describe the perceptions of nutrition education at a Czech medical school.

Methods: Thirty-six participants, including students in all grades (n = 30) and faculty members from different disciplines (n = 6), completed individual, semi-structured interviews. Interviews were audio-recorded and transcribed verbatim. Inductive coding and thematic analysis were used to analyze data and identify key themes.

Results: Participants emphasized the important and wide-ranging role of nutrition, describing it as significant and essential for both prevention and treatment of many medical conditions. The first main theme, 'Nutrition in Medical Care and Health' identified support for the important role that nutrition plays in medical care and health. Participants acknowledged that doctors have an important role to promote good nutrition and thus require sufficient education in medical school to offer general nutrition information to patients. In the second theme, 'Nutrition Education in the Current Curriculum' some participants acknowledged that while the medical school offers a good theoretical education about nutrition, and training for specific populations such as pediatrics and oncology, overall, the current education about nutrition was 'inadequate,' not emphasized like other subjects and lacked practical application in clinical practice. The third main theme 'Opportunities for Nutrition Education in Medical School' identified the students' interest in learning more about nutrition to improve their knowledge in preparation for future practice and to promote healthy eating during medical school. In addition to identifying specific topics of interest, the participants shared preferred methods of learning nutrition information.

Conclusions: The participants in this study recognized the importance of nutrition in medical care and perceived that nutrition education is not emphasized consistently in medical school. Students desired additional nutrition education to include current topics, promote self-care, and improve the emphasis in clinical training.

1. 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]. The World Health Organization reports that noncommunicable diseases

Abbreviations: CR, Czech Republic; CZ, Czech language; EN, English language; MU, Masaryk University; NCDs, Non-communicable diseases; UNCG, The University of North Carolina at Greensboro.

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(NCDs) are the leading cause of premature death worldwide and are impacted by modifiable risk factors such as an unhealthy diet [2]. Evidence-based research supports the benefits of nutrition therapy which includes assessment and education for numerous health outcomes [3,4] 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 diabetes [8] and cardiovascular disease [9]. While physicians provide medical care and patients see them as a trusted source of health information [10–12] many physicians feel unable to adequately counsel patients about common nutritional treatment options [13]. Unfortunately despite abundant evidence demonstrating the beneficial role of nutrition and dietetic interventions in the prevention, treatment and management of many health conditions [3,8,14], research identifies that many medical schools in Europe and around the world lack the recommended amounts of nutrition education for medical students [15–17]. This likely contributes to physicians reporting a lack of knowledge and time to provide patients with nutrition care [13,14,18], which is defined as “any practice done by a health professional to improve the nutrition behavior and subsequent health of patients.” [19] Until recently the Czech Republic (CR) was not represented in the published research on this topic, but a 2019 assessment of course syllabi from a Czech medical school curriculum estimates that students are getting fewer hours of nutrition education than is recommended, 19.5 vs 25 h [16,20,21]. With rising rates of obesity and nutrition related chronic diseases [22,23] along with more than half of the elderly population at risk of malnutrition [24], this represents a growing concern for the health of the population of the CR. The aim of this study was to explore the perceptions of medical students and faculty about nutrition education at a Czech medical school.

2. Materials and methods

This qualitative, cross-sectional study used semi-structured interviews with a wide range of medical students and faculty at a medical school in the Czech Republic. With no prior research about the process of nutrition education at a Czech medical school, tenets from a grounded theory approach [25–27] were used to explore and identify the experiences of faculty and medical students in all grades. As such, individual interviews were conducted in Czech (CZ), and English (EN) using open-ended questions to gather information, improve understanding, and identify any barriers to nutrition education in medical school. Open coding was used to inductively develop codes and general categories from the interview data [25,26], and thematic analysis was used to identify major themes [28,29]. The medical school provided a unique environment for exploring this issue because it 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 neighboring Slovakia, but also from countries in Europe and around the world. In addition, the medical school has taken steps to promote innovation by including dietitians on the faculty and through recent efforts to improve the quality of teaching and support preparation for students in clinical practice.

2.1. Participant recruitment

All students and faculty of the medical school were invited to volunteer for an individual interview with research staff. We purposely recruited a convenience sample of medical students from all grades in both the Czech and English programs, along with faculty teaching in one or both programs [25]. Potential participants were recruited through broadcast e-mail announcements, printed flyers posted on campus, referrals from other participants and through in-person visits by study staff to medical school classes to describe and promote the research. Recruitment continued until the primary researchers decided that no new or additional information was obtained from the student and faculty participants [30,31]. As an incentive to participate, students were offered a consultation with a dietitian.

2.2. Data collection

Thematic interview guides were developed in English by the study research team to collect demographic information and to explore the perceptions of study themes related to the role of nutrition in medical care, and nutrition education in medical school. Similar interview guides were developed for medical students and faculty, with some questions modified based on a student's grade in medical school and to include faculty clinical and teaching experience as indicated in Table 1. The interview guides were reviewed by faculty at Masaryk University (MU) and the University of North Carolina at Greensboro (UNCG), and translated into Czech. Face validation of the Czech and English versions was completed by members of the study population not otherwise involved in the research and resulted in a few minor wording changes to improve the clarity of the questions.

Interviews were conducted on the medical school campus by two primary researchers with each using her native language, Czech or English. Both researchers had 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 who prepared written interview notes. The 12-75-min interviews were audio recorded, transcribed verbatim and de-identified. The Czech transcripts were translated into English by a bi-lingual translator who was not involved in the study data collection. Each translation was reviewed by both primary researchers for accuracy and readability, and member checks were completed for several CZ and EN interviews [32].

2.3. Data analysis

The primary researchers independently reviewed each transcript and corresponding interview notes, identified emergent themes, and through open coding inductively developed and grouped codes to characterize the information expressed by participants. In addition, the researchers wrote descriptive memos to identify emerging ideas throughout the process [25,26]. These results were compared and discussed collaboratively to corroborate themes, codes, and the grouping of codes. The codes and themes were then reviewed, discussed, and endorsed by other team members. The transcripts were coded using Atlas.ti version 9 (ATLAS.ti Scientific Software Development GmbH Berlin, Germany) and subsequent data analysis was conducted collaboratively by the primary researchers using thematic analysis [28,29]. Participant quotes were identified for themes and are presented to illustrate and describe the results.

2.4. Ethical approval and consent to participate

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 before enrollment.

3. Results

Thirty-six participants completed interviews from April 2019 to February 2020, including medical students (n = 30) and members of the medical school faculty (n = 6). The students were equally divided between the CZ and 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) as presented in Table 2.

Most of the faculty participants were clinicians (n = 5; 83%), with n = 3 medical doctors and n = 2 health professionals (nurse and dietitian), while one had no clinical experience as shown in Table 3. Overall, the faculty participants represented a variety of disciplines including internal medicine, pediatrics, oncology, nursing, biochemistry, and public health.

Through thematic analysis [28,29] three main themes were identified related to medical student and faculty perceptions about nutrition education in medical school and are presented in Table 4.

3.1. Theme 1. nutrition in medical care and health

3.1.1. Subtheme 1. importance of nutrition

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.

"Without the proper diet you cannot have proper medicine."

Grade 3, EN program

"Nutrition plays a major role in treating a patient."

Faculty.

3.1.2. Subtheme 2. Doctor's role in providing nutrition care

Regarding the role of doctors in providing nutrition care, most students and faculty members agreed that doctors play an important role in promoting good nutrition and should be educated to offer general nutrition information to patients. Students recognized that patients view the doctor as a role model and stressed that doctors should not offer incorrect or inconsistent advice regarding nutrition topics. Barriers such as limited time during patient visits, inadequate nutrition knowledge and varied emphasis on nutrition were identified. Participants expressed concerns about doctors having sole responsibility for offering nutrition education and advice.

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%

"Doctors should definitely have information about proper nutrition."

Grade 4, CZ 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.

3.2. Theme 2. nutrition education in the Current Curriculum

3.2.1. Subtheme 1. general education focusing on theoretical information

Both faculty and students perceived 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, many other faculty and students expressed frustration and requested more be added to the curriculum. These participants described the current nutrition education as "inadequate" and "not enough," declaring it is insufficient for today's medical care.

"[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

Table 1
Interview guide questions for medical students and faculty.

Major Questions – Medical Students	Major Questions – Medical Faculty
What do you think about the role of nutrition in medical care?	What do you think about the role of nutrition in medical care?
What do you think about nutrition education at MU medical school? **	How did you gain your nutrition related knowledge?
**Grade 1 Semester 1 students:	
Where do you go for more information about nutrition?	
How well does the MU course work prepare you to address nutrition with your patients? **	What do you think about the nutrition education in the curriculum at MU medical school?
**Grade 1 Semester 1 students:	
What nutrition topics would you like to learn about?	
What information, resources or skills do you need to be equipped to provide nutrition related care to your patients?	How well do the classes and training prepare students to address nutrition with patients?

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%

> "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.

3.2.2. Subtheme 2. limited emphasis on nutrition topics

Some students perceived that the faculty emphasize nutrition topics only in certain subjects including pediatrics, oncology, biochemistry, and public health. Otherwise, they perceived that nutrition is treated like a secondary subject, only briefly discussed, not a priority and not emphasized in tests. Faculty identified possible barriers to learning nutrition and including nutrition education in the curriculum, such as a lack of time in the current schedule, the pervasive attitude underestimating the importance of nutrition, and speakers not updating lectures to include new or changing information related to nutrition topics.

> "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.

3.2.3. Subtheme 3. preparation for clinical practice

Students and faculty perceived that the school's lack of emphasis on nutrition is continued through to clinical training. Students at different levels of education confirmed that while the importance of nutrition may be discussed, their education was inadequate and they lack confidence offering nutrition 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 requires a lot of time.

> "I wouldn't dare advise anyone on [nutrition]."
>
> Grade 6, CZ program
>
> "I have not seen any emphasis given by the doctor to the patient [about] nutrition."
>
> Grade 6, EN program.

3.3. Theme 3. Opportunities for Nutrition Education in Medical School

3.3.1. Subtheme 1. student interest in personal nutrition for self-care

While students expressed an interest in learning more about nutrition to support their work as future doctors, they emphasized the importance of improving their nutrition knowledge to promote healthy eating through the long hours of studying and stress associated with medical school. With students from different countries as well as some students away from home for the first time, they emphasized the need for nutrition knowledge and skills to support a healthy lifestyle. This includes both practical education about food and meal planning as well as access to dietitians for personal counselling and advice.

> "[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
>
> "Many students are coming from abroad without relatives here. So, we don't have the time to also 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.

3.3.2. Subtheme 2. interest in more practical education and training

Students and faculty offered suggestions to improve nutrition education at the medical school. In addition to the specific nutrition topics presented in Table 5, they expressed a preference for interactive experiences to develop practical skills including case studies, role plays and opportunities to learn from experienced clinicians through both lectures and demonstrations.

> "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

Table 4
Main themes and sub-themes identified from data analysis.

Theme	Subtheme
Nutrition in medical care and health	1 Importance of nutrition
	2 Doctor's role in providing nutrition care
Nutrition education in the current curriculum	1 General education focusing on theoretical information
	2 Limited emphasis on nutrition topics
	3 Preparation for clinical practice
Opportunities for nutrition education in medical school	1 Student interest in personal nutrition for self-care
	2 Interest in more practical education and training

Table 5
Student's most popular responses to nutrition topics of interest (listed in order of preference).

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

"[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.

4. Discussion

4.1. Nutrition in medical care and health

The findings of this study demonstrated that students and faculty at a Czech medical school clearly perceived the important role of nutrition in medical care and health [5–9] and consistent with other research, affirmed that doctors have an important role to play in providing nutrition care to patients [18,33,34]. Similar to other studies, our participants identified barriers to providing nutrition care including limited time during patient visits, their lack of nutrition knowledge and low confidence to deliver nutrition education and advice [18,35]. Despite these barriers, global research documents that patients view their doctor as a reliable source of advice for healthcare issues including nutrition [11,12,36]. Study participants recognized that patients not only seek nutrition advice, but students also acknowledged that doctors should serve as role models for patients [34]. Evidence exists that nutrition education and knowledge can translate into healthier behaviors that may support improved nutrition care for patients [19,37].

4.2. Nutrition education in the current curriculum

Regarding the nutrition education offered at the medical school, many participants praised the theoretical education offered in the program. But similar to studies at other medical schools, the students in this study expressed frustration about a lack of emphasis on nutrition including limited nutrition information discussed in courses, and nutrition topics not included on exams [19,38,39]. As with other research, faculty participants perceived barriers to teaching nutrition topics which included a crowded curriculum and limited time available for updating lectures as nutrition science continues to evolve [40]. This suggests that despite rising rates of NCDs and malnutrition in the Czech population [22–24] the importance and benefits of current evidence based nutrition care for these and other conditions may not be discussed with the medical students. Furthermore, while some courses included nutrition topics in their clinical education, overall students perceived that faculty teaching clinical courses did not discuss or demonstrate offering nutrition care to patients, a finding consistently reported in research from other medical schools [41–44]. The limited emphasis on nutrition in clinical education was evidenced by several students in their final year reporting a lack of confidence to offer nutrition care to patients. Although consistent with reports from other medical schools [35,44], this finding is concerning because doctors have the potential to improve their patient's dietary habits by providing nutrition advice [36,45], and lends support for evaluating the use of competency standards to advance nutrition education in medical school [46,47].

4.3. Opportunities for nutrition education in medical school

In our study, nearly half of the students expressed an interest in interactive nutrition education in current topics including skills to promote self-care. This was identified by students in all grades, with several suggesting that self-care education should be provided in the pre-clinical education during grades 1 and 2. Participants recognized the stress associated with medical school and the challenges faced by students to support healthy eating including missing meals due to long hours of study. These findings were consistent with results from other studies [48,49]. In recent years, this has been addressed in part through the emergence of culinary nutrition education in medical schools which blends "the art of food and cooking with the science of medicine." [50] Several of our pre-clinical students acknowledged that they are living away from home for the first time, and for those in the EN program this may be their first time in the CR, thus offering new challenges for acclimating to new food choices and availability. Research demonstrates the importance of self-care for doctors with evidence showing those that practice healthful behaviors are more effective counselors for patients [37,45].

4.4. Strengths and limitations

A strength of this study is that we interviewed students and faculty in both the Czech and English programs at a large Czech medical school, thus including additional perspectives to the global literature on this topic. We included faculty with different types of expertise and clinical experience along with students in all grades, thus enriching the views and perceptions obtained. In addition, the interviews were conducted using standard interview guides and lead by trained facilitators.

A limitation of the study was using a convenience sampling approach to recruit participants. While this method was selected because we had no knowledge about the perceptions of nutrition education in Czech medical schools, a more representative sample may have identified different viewpoints, as most of the participants expressed support for the role of nutrition in medical care. In addition, although it was beneficial to obtain viewpoints from students and faculty in both programs, the translation of materials and transcripts may have resulted in the loss of subtle information.

5. Conclusions

This study highlights the interest and support for offering more nutrition education at a medical school in the Czech Republic. Overall, both students and faculty recognized the important role of nutrition in medical care but acknowledged the limited emphasis on nutrition education throughout medical school. Students desired more nutrition education and training to promote self-care and better prepare them for clinical practice. Further research is needed to assess opportunities to improve the nutrition education in medical training. This includes assessing the time allocated to nutrition education, and the relevance of the topics related to clinical care. In addition, the feasibility of offering education in current topics in nutrition and promoting healthy eating among medical students could be investigated, along with practical methods of training to better prepare students to incorporate nutrition care into clinical practice.

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Credit author statement

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Declaration of competing interest

None to declare.

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