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Assessment of the knowledge on nutrology among medical course students: an observational cross-sectional study

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Abstract

Introduction: An unbalanced diet is responsible for more deaths than any other risk factor, including smoking. By definition, Nutrology is the medical specialty whose function is to prevent, diagnose and treat nutroneurometabolic diseases. As it is a relatively new specialty, it has not yet become part of the basic curriculum as a mandatory subject in most medical schools. This fact means that students have little or no contact with the specialty during their academic training. **Objective:** The objective of this study was to evaluate the knowledge on Nutrology among medical students. **Methods:** An observational and cross-sectional study was conducted to assess the knowledge of students enrolled in the Ugraft Journey of the Plastic Surgery Leagues of Rio Grande do Sul. Data collection took place through the application of an online questionnaire comprising 14 questions**. Results:** A total of 170 participants spanning across all semesters of the course, representing 7 universities (UFSM, UFCSPA, UFN, UFAL, Unoeste, Univates, and Unijuí). The participants were aged between 18 and 43 years old, 114 were female and 56 were male. In regard to the question of which course Nutrology is a part of, 84.1% answered Medicine, 14.7% answered Nutrition, and 1.2% answered another course. Additionally, 67.6% stated that they do not know or are not sure about the area of activity of Nutrology, while only 17.6% have already consulted a Nutrologist. Concerning the significance of dietary guidance and supplementation during the pre- and post-operative phases of surgery, 98.2% deemed it advantageous for the patient. When it came to distinguishing between the various indications for oral dietary supplementation, enteral, or parenteral therapy, 74.7% did not know how to differentiate them. Regarding the safety of prescribing a food supplement, 90% do not feel able to do so. As for the meaning of the acronym MNTT, 93% are unaware. Regarding obesity being a chronic disease, 92.4% agreed. Regarding the desire to undertake a residency in Nutrology, 12.9% expressed interest. Finally, regarding the importance of the subject of Nutrology in the curriculum, 94% considered it important. **Conclusion:** Despite the increasing prevalence of nutrition-related diseases and the evidence showing that poor diet is responsible for more deaths than any other risk factor, studies have observed that the majority of medical students feel unprepared regarding the subject. The findings of this study could serve as motivation for institutions to reconsider the significance of incorporating the discipline of Nutrology into the medical curriculum.

Keywords: Nutrology. Medical students. Knowledge.

Introduction

An unbalanced diet is responsible for more deaths than any other risk factor, including smoking **[1,2]**. Improving global dietary standards could potentially

prevent one in five deaths, highlighting the urgent need to improve the human diet in all nations [3]. The Brazilian Association of Nutrology (ABRAN) was founded in 1973 in Rio de Janeiro [4]. However, it was only in 1978 that Nutrology was recognized as a Medical Specialty by the Federal Council of Medicine (CFM), the Brazilian Medical Association (AMB) and the National Council of Medical Residency (CNRM) [4].

By definition, Nutrology is a medical specialty of a clinical nature whose function is to prevent, diagnose and treat nutrineurometabolic diseases [4]. In other words, it addresses nutrition in its normal, pathological, clinical, and therapeutic dimensions. This entails a comprehensive reconsideration of the human condition, enabling professionals to address disorders stemming from both nutritional excess and deficiency. As hunger represents a remediable social evil.

As it is a relatively new specialty, it has not yet become part of the basic curriculum as a mandatory subject in most medical schools. This fact means that students have little or no contact with the specialty during their academic training. Despite the increasing prevalence of nutrition-related diseases and substantial evidence that poor dietary habits are responsible for more deaths than any other risk factor [3], research indicates that the majority of medical students feel inadequately prepared regarding nutritional education [5]. Among the reasons for that is the lack of contact with this specialty during their training [5].

The discipline of nutrology is not included in the mandatory curriculum at most medical schools in the country. Consequently, students often lack the confidence and competence necessary to prevent, diagnose, and treat nutritional disorders. The lack of nutritional knowledge impacts both patient treatment and the quality of life of the medical students themselves. Research indicates that the prevalence of overweight and obesity increases as medical students approach the completion of their studies, a trend attributed to poor dietary habits and increasingly sedentary lifestyles [6-8].

The presentation of the results of the present study may serve as an impetus for the Federal Council of Medicine and universities to consider incorporating Nutrology into the undergraduate curriculum, either as a mandatory or elective subject. Furthermore, it may encourage the creation of academic Nutrology leagues and scientific research in the area, thus promoting an increase in nutrological knowledge and, consequently, an improvement in the quality of life of these future doctors and their patients.

The objective of this study was to evaluate the knowledge on Nutrology among medical students.

Methods

Study Design

An observational cross-sectional study was conducted to assess the nutrological knowledge of medical students participating in the 1st Functional Ugraft Journey organized by the Academic Plastic Surgery Leagues of Rio Grande do Sul, Brazil.

Data Collection

Data collection was conducted using a semi-structured online questionnaire, which consisted of two sections. The first section included four questions focused on sociodemographic information, while the second section contained ten questions specifically related to the topic under investigation, resulting in a total of fourteen (14) questions. The form applied consisted of a questionnaire validated by the reliability of Cronbach's alpha coefficient [9]. Subsequently, the data collected were analyzed using descriptive statistics and parametric and non-parametric tests (significance level $p \leq$ or equal to 0.05), allowing better direction of the resulting statistical analysis.

Ethical Approval

This study was conducted with the approval of the Research Ethics Committee of Franciscan University of Santa Maria, Rio Grande do Sul, Brazil, under the number 6130948, following the proposed schedule. The research protected the secrecy and confidentiality of the data and the nominal preservation of the participants of this research, being characterized only the data stipulated and described in this study with use in a joint manner. A link was created containing the free and informed consent form, the confidentiality term and the questionnaire.

Statistical Analysis

The data were compiled in Excel® 2016 software and statistically analyzed. The questionnaire proposed in this study was validated using the statistical technique of Cronbach's alpha (α) to know the reliability and measure of internal consistency. The calculation of Cronbach's alpha coefficient (α) required the administration of only one test to provide a single estimate of the reliability of the entire research. The reliability of Cronbach's alpha coefficient varies between 0 and 1 as a standard. The classification of the reliability of Cronbach's alpha coefficient obeyed the following limits: A. $\alpha \leq 0.30$ – Very low; B. $0.30 < \alpha \leq 0.60$ – Low; C. $0.60 < \alpha \leq 0.75$ – Moderate; D. $0.75 < \alpha \leq 0.90$ – High; E. $\alpha > 0.90$ – Very high [9].

Results

The questionnaire containing a total of 14 questions was sent to 8 Medicine schools, from different Brazilian regions and with participants in different semesters of the undergraduate Medicine curriculum, covering students at all stages (Tables 1 and 2). The validation analysis of the questionnaire proposed in this study using Cronbach's alpha (α) statistical technique showed that the reliability classification was high, with alpha (α)=0.83, considering 0.75<α≤0.90.

Table 1. Participating institutions and number of individuals.

Institutions	Number of Individuals
UFCSPA	3
UFN	46
UFAL	3
UFSM	52
UNIJUÍ	13
UNIVATES	16
UNOESTE	27
UNOESTE- GUARUJÁ	10
Total	170

Source: Own Authorship.

Table 2. Number of individuals in each semester of the Medicine course.

Semester	Number of Individuals
1º	35
2º	11
3º	6
4º	13
5º	12
6º	40
7º	15
8º	11
9º	5
10º	11
11º	5
12º	6
Total	170

Source: Own Authorship.

The present study obtained responses from a total of 170 individuals, comprising 114 females (67.1%) and 56 males (32.9%), with ages ranging from 18 to 43 years. Concerning the knowledge of which specialty the area of Nutrology is part of, approximately 84.1% correctly identified it as a branch of Medicine, 14.7% mistakenly associated it with Nutrition, and 1.2% believed it belonged to another field. More than 67.6% of participants do not know and/or have doubts regarding the area of expertise of the professional specialist in Nutrology. Only 17.6% of the sample had already consulted a Nutrologist at some point in their lives.

Concerning the questions regarding the importance of dietary guidelines and food prescription in the pre- and post-operative phases of surgical intervention, 98.2%, acknowledged their potential benefits for patients. However, regarding their knowledge of the specific indications for prescribing oral dietary supplementation, nutritional therapy, or parenteral therapy, 74.7% of participants reported an inability to differentiate among these modalities.

When asked about the safety of prescribing a food supplement, over 90% of respondents indicated they did not feel capable of doing so safely. Additionally, more than 93% were unaware of the meaning of MNTT (Multidisciplinary Nutritional Therapy Team). Regarding obesity, 92.4% of participants recognized it as a chronic disease, while 7.6% did not.

The last two questions addressed the perceived importance of including Nutrology in the medical curriculum and the interest in pursuing medical residency or postgraduate studies in Nutrology. Over 94% of participants considered Nutrology to be an important discipline for the medical curriculum. However, approximately 87.1% did not express interest in pursuing a medical residency or postgraduate degree in Nutrology, while 12.9% indicated interest in the field. The last two questions addressed the perceived importance of including Nutrology in the medical curriculum and the interest in pursuing medical residency or postgraduate studies in Nutrology. Over 94% of participants considered Nutrology to be an important discipline for the medical curriculum. However, approximately 87.1% did not express interest in pursuing a medical residency or postgraduate degree in Nutrology, while 12.9% indicated interest in the field.

Finally, the last two questions addressed the perceived importance of including Nutrology in the medical curriculum: Over 94% of participants considered Nutrology to be an important discipline for the medical curriculum; and regarding the interest in pursuing medical residency or postgraduate studies in Nutrology - approximately 87.1% did not express interest in the field, while 12.9% did.

Discussion

The aim of this study was to assess the understanding of medical students of the field of Nutrology, its relevance within medical education, and

the necessity of knowledge in this area for providing optimal nutritional care to patients. It is known that the importance of adequate nutrition for both healthy and unhealthy individuals is well documented in the literature, and the prevalence of diseases associated with poor nutrition is increasing **[10,11]**. Despite this, nutritional education in medical schools remains inconsistent, ineffective, and unsystematic, resulting in significant deficiencies in medical training **[11,12]**.

It is crucial for health students to understand during their training that obesity is a chronic disease characterized by the excessive accumulation of body fat, resulting from a positive energy balance. This condition has devastating health repercussions and leads to a significant loss of quality of life **[13]**. The lack of knowledge in this area may be attributed to inadequacies in the school curriculum related to nutritional education, as assessed in this study.

This research aligns with existing literature, which indicates a substantial deficiency in knowledge concerning the field of Nutrology. This includes limited understanding of the various indications for prescribing oral dietary supplementation, nutritional therapy, or parenteral therapy, as well as a lack of confidence in safely implementing nutritional interventions for patients. A systematic review carried out in 2019 highlights the inadequate incorporation of the discipline of nutrition into medical school curricula, irrespective of country, location, or year of medical education **[14]**. It is evident that despite the critical importance of nutrition for maintaining a healthy lifestyle, medical students are not sufficiently prepared through their education to deliver effective, high-quality nutritional care to patients **[14]**.

Nevertheless, an evaluation of the responses reveals that participants exhibited insecurity regarding the supplementation of their patients, which can be attributed to the absence of a dedicated Nutrology course in their undergraduate medical curriculum. This is supported by the literature, which indicates that students from various universities express dissatisfaction with the nutrition education they have received and feel unprepared to practice safely in this medical field **[15]**.

The medical students evaluated in this research, as well as in the literature findings, reported inadequate nutritional knowledge, whether evaluated objectively or subjectively; varying in their confidence and perceived competence to provide nutritional care, as well as lack of confidence in counseling patients on nutrition **[13]**.

Finally, it is important to emphasize that the selection of a medical specialty is characterized by a dynamic process. In this process, students try to optimally align their values, needs, and capabilities with the expectations and needs of others, as well as with the attributes of various career options that they perceive to be suitable for themselves **[16]**. A portion of future physicians typically decide on their specialty during the third or fourth year of medical school, following exposure to various medical disciplines **[16]**. Therefore, it is imperative to integrate the subject of Medical Nutrology comprehensively within the academic curriculum. This integration will enable students to engage directly and effectively with this specialized knowledge. Consequently, they will be better equipped to make informed decisions regarding their potential pursuit of a career in Nutrology.

Based on the aforementioned considerations, it is evident that conducting an environmental analysis to address this potential gap in medical education is crucial. Such an analysis will facilitate the development of robust strategies for medical nutritional education, thereby equipping future physicians with the essential tools to promote well-being and effectively manage disease **[13,15]**.

Conclusion

Despite the increasing prevalence of nutrition-related diseases and the substantial evidence indicating that poor diet is responsible for more deaths than any other risk factor, research has shown that a majority of medical students feel inadequately prepared in this area. The findings of this study may serve as a catalyst for educational institutions to reevaluate the importance of incorporating Nutrology into the medical curriculum.

CRediT

Author contributions: **Conceptualization** - Paloma Salomone, Mauricio S. Viaro, Michely Machado, Silvana Leão, Liliane Alves Pereira; **Data curation -** Paloma Salomone; **Formal Analysis -** Paloma Salomone, Mauricio S. Viaro, Michely Machado, Silvana Leão, Liliane Alves Pereira; **Investigation-** Paloma Salomone, Mauricio S. Viaro, Michely Machado, Silvana Leão, Liliane Alves Pereira; **Methodology-** Mauricio S. Viaro, Michely Machado, Silvana Leão, Liliane Alves Pereira; **Project administration-** Paloma Salomone; **Supervision -** Paloma Salomone, Liliane Alves Pereira; **Writing - original draft-** Paloma Salomone, Mauricio S. Viaro, Michely Machado, Silvana Leão, Liliane Alves Pereira; **Writing-review & editing-** Paloma Salomone, Mauricio S. Viaro, Michely Machado, Silvana Leão, Liliane Alves Pereira.

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Not applicable.

Ethical Approval

This study was conducted with the approval of the Research Ethics Committee of Franciscan University of Santa Maria, Rio Grande do Sul, Brazil, under the number 6130948, following the proposed schedule. The research protected the secrecy and confidentiality of the data and the nominal preservation of the participants of this research, being characterized only the data stipulated and described in this study with use in a joint manner. A link was created containing the free and informed consent form, the confidentiality term and the questionnaire.

Informed Consent

It was applicable.

Funding

Not applicable.

Data Sharing Statement

No additional data are available.

Conflict of Interest

The authors declare no conflict of interest.

Similarity Check

It was applied by Ithenticate®.

Peer Review Process

It was performed.

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