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Dietetics students' opinion on food and their future profession

Opinião de estudantes de Nutrição sobre alimentação e sobre sua futura profissão

Abstract

Introduction: Although it is believed that dietitians will use their opinions about food in their professional practice, few studies evaluated conceptions about food and health among dietitians, and this evaluation could be useful for understanding university education and thinking about possible professional implications. **Methods:** The study aimed to understand the role of food and what it means to be a dietitian from the perspective of Brazilian dietetics students (495 from 34 institutions in the state of São Paulo) through the questions, "What do you consider the main role of food?" and "For me, being a dietitian means..." The responses were analyzed with the support of AtlasTi software and codified into analytical categories based on content analysis. **Results:** Of the total, 93% were female and 20% were enrolled in public institutions. Two main categories were defined for food: biological and psycho-sociocultural aspects, and two for nutritionists: health promoter and integral health promoter; 69% indicated the function of food as only biological and 61,3% see the dietitian to be only a health promoter, considering only physiological aspects. Students from public institutions responded more for psycho-sociocultural aspects and integral health promotion ($p < 0.0001$). **Conclusion:** Most participants present opinions about food in their professional practice focusing mainly on biological and physical health aspects. The possible impact of these opinions on professional practice should be discussed and addressed so that undergraduation can expand critical training and better professional practice.

Keywords: Nutritional Sciences. Health Knowledge. Attitudes, Practice. Education, Professional.

Resumo

Introdução: Embora se acredite que os nutricionistas utilizem suas opiniões sobre alimentos em sua prática profissional, poucos estudos avaliaram as concepções sobre alimentos e saúde entre nutricionistas, e tal avaliação pode ser útil para entender a formação universitária e refletir sobre possíveis implicações profissionais. **Métodos:** O estudo buscou compreender o papel dos alimentos e o que significa ser nutricionista na perspectiva de estudantes de Nutrição brasileiros (495 em 34 instituições no estado de São Paulo), por meio das perguntas: "Qual você considera ser o principal papel dos alimentos?" e "Para mim, ser nutricionista significa...". As respostas foram analisadas com o suporte do software AtlasTi e codificadas em categorias analíticas com base na análise de conteúdo. **Resultados:** Do total, 93% eram mulheres e 20% estavam matriculadas em instituições públicas. Duas categorias principais foram definidas para alimentos: aspectos biológicos e psicossocioculturais, e duas para nutricionistas: promotor de saúde e promotor de saúde integral; 69% indicaram a

função dos alimentos como apenas biológica e 61,3% veem o nutricionista apenas como um promotor de saúde, considerando apenas aspectos fisiológicos. Estudantes de instituições públicas responderam mais para aspectos psicossocioculturais e promoção de saúde integral ($p < 0,0001$). **Conclusão:** A maioria dos participantes apresenta opiniões sobre alimentos focando principalmente nos aspectos biológicos e de saúde física. O possível impacto dessas opiniões na prática profissional deve ser discutido e abordado, para que a graduação possa expandir a formação crítica e melhorar a prática profissional.

Palavras-chave: Ciências Nutricionais. Conhecimento, Atitudes e Práticas em Saúde. Educação Profissional

INTRODUCTION

The relationship between food and health is well established, and it is generally accepted that having a healthy diet is one of the determinants of health and is, therefore, the focus of health promotion.¹ Dietitians are responsible for diverse areas that involve “health promotion, maintenance and recovery using food”² and will probably act according to their perception of eating and nutrition and the understanding of their role as professionals.

Food and health are frequently and massively discussed nowadays, and people are concerned about these aspects. The process of medicalization of food has accentuated in recent decades and reinforced this connection between food and health – which has always existed – in all sociocultural groups.³ However, we have seen an increasing prevalence of obesity, chronic diseases, and eating disorders worldwide.^{4,5} This makes us question how people eat, but also what they understand as health and healthy eating.

Irrespective of being considered utopian or simplistic,⁶ just as how the World Health Organization defined health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”,⁷ eating should not privilege only the physiological aspects of an individual. It must be considered in its biopsychosociocultural dimension,⁸ taking into account that despite eating has an undeniable vital biological function, through it “the biological man and the cultural and social man are strictly bound”.⁹ Hence, the diet must have a broader paradigm, as proposed by the Food Guide for the Brazilian Population: planned with all kinds of foods, respecting and valuing culturally identified food practices, and aiming to satisfy nutritional, emotional, and social needs.¹⁰

Some differences in the dietitian training and regulation of dietetics careers can be observed worldwide.¹¹ In Brazil, after completing a bachelor's degree in a Nutrition course (equivalent to a Dietetics major) with a duration of four to five years, they will obtain a title corresponding to the “registered dietitian” in the US, which will entitle them to work in clinical and diet therapy, as well as in-service administration, marketing, sports, and experimental cooking. Despite the development of the dietitians' professional activity¹¹ and their importance in addressing eating issues and professional role, there have been few studies about the opinions of dietetics students about food – in that of discussion of senses and meanings, both individually and collectively – and their own role as a health professional.

In Canada, a study evaluated dietetics students (N=9) through focus groups with guiding questions about what is healthy and found that a healthy diet was often described as “that where all groups of the foods pyramid are included, associated with moderation and balance, needs to be customized and pleasant and makes one feels good” activity.¹² In a Brazilian city, the concept of a healthy diet by health professionals (including dietitians) was evaluated. They were questioned about this concept and answered that healthy eating was defined as “a varied, balanced and well-proportioned diet with nutrients, which provides benefits to health, is suitable to the individual's nutritional needs to have a healthy body weight, and has fresh, natural and whole foods”.¹³ Another study was conducted with dietetics students in the state of São Paulo, Brazil, and found that although the key factors of healthy eating were following Brazilian guidelines, some dysfunctional concepts, attitudes, and beliefs reveal that these issues should be better addressed throughout academic training.¹⁴ A study comparing Brazilian, Spanish, and French dietitians and young laywomen tried to understand the social representations of healthy food and found that it is ambivalent and polysemic, divided on the one hand, a physiological, nutritional and functional conception, and the other, an “eco-ideological” conception that took into account production, culture and distribution methods.¹⁵

These results reinforce the need to discuss the training of the dietitians and their conceptions. Nevertheless, the exploration of the opinion of healthy eating among dietitians is scarce¹⁶ and it is believed

that this evaluation is interesting and can bring important subsidies to rethink training and professional practice, as well as the promotion, maintenance, and recovery of health. It can be hypothesized that students' opinions of the role of food and the role of the dietitian may govern and influence their practice as health professionals. Thus, this study aimed to understand the role of food and what it means to be a dietitian for dietetic students. This knowledge may be important for the current scenario of food and nutrition "cacophony"⁸ with the possibility of a content review and focus of academic education of dietitian's training.

METHODS

An interdisciplinary team composed by researchers from the field of Nutrition and the Human and Social Sciences carried out this cross-sectional study. The research design and data analysis were conducted to seek articulation between different fields of knowledge, especially Nutrition and the Socio-Anthropology of Food. The data analyzed in this article is part of the Nutritionists' Health Study cohort.¹⁶

Undergraduate Dietetics students from public and private higher educational institutions with courses registered at the Ministry of Education of Brazil in 2014 (N=53; 5 of them public and the others, private) in the state of São Paulo (Southeast Brazil) were invited to participate. The sample size was calculated considering the institutions with dietetic courses in São Paulo recognized by the Ministry of Education and the average number of students who completed the course at each institution in the years 2012 and 2013 who applied for registration with the Regional Council of Nutrition that encompasses São Paulo. The sample size of 360 students was calculated based on a 95% confidence coefficient and an estimation error of 0.015.¹⁴

Dietetics students aged 18-30 years, who agreed to participate, were included in the study. Those who reported having any chronic disease were not included since some clinical conditions require specific care with food and can change their eating attitude. For the sample characterization, they informed: an educational institution (public or private), the locality of the institution, the undergraduate term that they were coursing, age, body weight, and height (for calculation of the Body Mass Index – BMI), sex and marital status. After the agreement of the institution, the research was disclosed to the students in the classrooms or auditorium with the delivery of a printed form; or by the course coordinator or professor defined by the coordinator; or by institutional e-mail and posters in the institutions – through which the students were instructed to access the research page. Data were collected on-line through the research web page.^{14,16}

Among the various questions in this study, developed based on qualitative and quantitative studies carried out both with dietitians and other populations,^{17,18} they should answer two open-ended questions: 1) "Please answer in a few lines what is for you the main role of eating" and 2) "To me, being a dietitian means..."

This is a quantitative study that collected qualitative data through open-ended questions. The statistical analysis of descriptive data was carried out by the SPSS program, version 21.0 (IBM Corporation, Armonk, NY (USA)). The questions on characterization are presented in the frequency of response or mean and standard deviation. The answers to the open-ended questions were analyzed by two researchers with the support of the Atlas.ti software, version 7.5.2 (Scientific Software Development GmbH, Berlin, Germany).

Based on the analysis of open questions included in questionnaire¹⁹ and Contents Analysis,²⁰ categories were identified for each question, defined in accordance with the research objectives and the content emerging from the responses, thus, each question were codified into two analytical categories with subdivisions. The chi-square test was used to investigate the association between the analytical categories of answers given to open-ended questions and type of institution and sex.

The study was developed according to the National Health Council Resolution no. 466/2011 and was approved by the Research Ethics Committee, of the Faculdade de Saúde Pública, Universidade de São Paulo

(Public Health Faculty, University of São Paulo), (protocol no. 44576515.0.0000.5421) and the participants accessed information on the first page of the website of the on-line survey and expressed their consent to participate by ticking “accepted”.

RESULTS

We surveyed 445 students from 34 educational institutions (4 public; 30 private) located in 22 municipalities in the state of São Paulo, Brazil. The mean age was 22.9 (SD 3.0); 20.0% of the students were enrolled in public institutions; 93.3% were female; 70.1% had a normal BMI weight range; 23.4% were overweight and 90.3% were single.

Based on the responses given to “... what is for you the main role of eating”, two main analytical categories were defined corresponding to distinct conceptions of eating, being associated with two kinds of rationality: “biological aspects” and “psycho-sociocultural aspects” which one with subcategories. Due to the thin line contained in statements, some subcategories were included in the Biological aspects and the Psycho-sociocultural aspects. Table 1 describes the subcategories according to each category, and the frequency of participants’ responses about the role of eating.

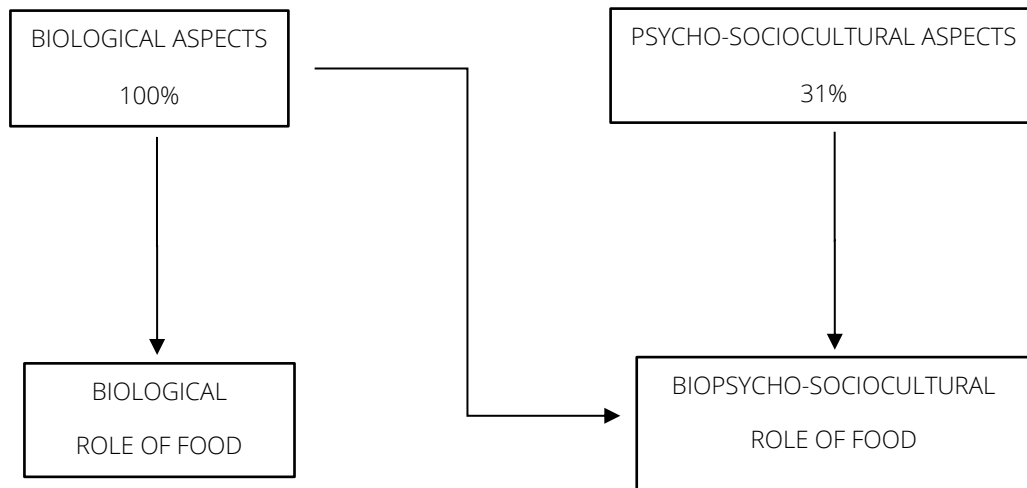
Table 1. Categories, subcategories, and frequency of responses on the role of eating by Dietetics students (N=445). São Paulo, Brazil, 2015-2017.

| Role of eating | N | % |
|-------------------------------------|------------|--------------|
| Biological aspects | 445 | 100.0 |
| Well-being | 26 | 5.8 |
| Energy | 89 | 20.0 |
| Aesthetics | 3 | 0.7 |
| Body functioning/physiological need | 195 | 43.8 |
| Nourishment | 262 | 58.9 |
| Quality of life | 15 | 3.4 |
| Satiety | 15 | 3.4 |
| Health | 114 | 25.6 |
| Survival | 73 | 16.4 |
| Diseases treatment/ prevention | 38 | 8.5 |
| Psycho-sociocultural aspects | 138 | 31.0 |
| Soul | 6 | 1.3 |
| Spiritual aspect | 1 | 0.2 |
| Cultural aspects | 13 | 2.9 |
| Political / ethical aspects | 3 | 0.7 |
| Psychological aspects | 44 | 9.9 |
| Social aspects and socialization | 46 | 10.3 |
| Well-being | 26 | 5.8 |
| Aesthetics | 3 | 0.7 |
| Happiness | 6 | 1.3 |
| Pleasure | 68 | 15.3 |
| Quality of life | 15 | 3.4 |

Source: The authors, 2024.

Based on the analytical categories of Biological and Psycho-sociocultural aspects, the participants were divided into two groups according to their stated role of food: “biological function” and “biopsychosociocultural function”. The first group is composed of individuals who considered only the Biological aspects, and the second, individuals who considered both the Biological and the Psycho-sociocultural aspects (all participants who considered the Psycho-sociocultural aspects also indicated the Biological aspects).

Figure 1. Relationship between the categories and the role of food.



Source: By authors, 2024

All participants mentioned, as the main function of eating, biological aspects such as to provide energy, ensure the body function and nourish, as indicated by NSC (female, 24 years): “To provide energy and nutrients for the body to function properly”. Similarly, RP (male, 24 years): “To maintain or recover the body homeostasis to ensure good health and quality of life to the human being”.

Also as stated by WSV (male, 22 years): “To keep us alive, and if we eat properly we will be healthy and free of chronic diseases”, who highlighted aspects related to health, prevention of diseases, and survival.

Of total 31% considered the Biopsychosociocultural aspects as the main role of eating (Table 1), comprising biological aspects as well, but mentioning social, cultural, and psychological ones, as indicated by JD (female, 21 years): “Maintaining life and physical and mental well-being every day. Food is a necessary and frequent component; besides ensuring body nourishment, it gives pleasure and satisfaction”.

The perception of the role of eating as Biological function was higher between individuals from private institutions (74.7% versus 30.8%; $p < 0.001$). No association was found between categories and sex.

According to the answers given to “To me, being a dietitian means...”, two main analytical categories were also defined: “aspects relating to physical health” and “aspects relating to mental and social health”, taking into consideration the WHO’s definition of health,⁷ each of them composed of subcategories. Of the total number of students, 3.6% of them indicated aspects that do not fit into these two categories, such as MD (female, 26 years): “Make a dream come true”.

Table 2 presents the subcategories as well as the frequency of responses according to the students’ opinions on what it means to be a dietitian.

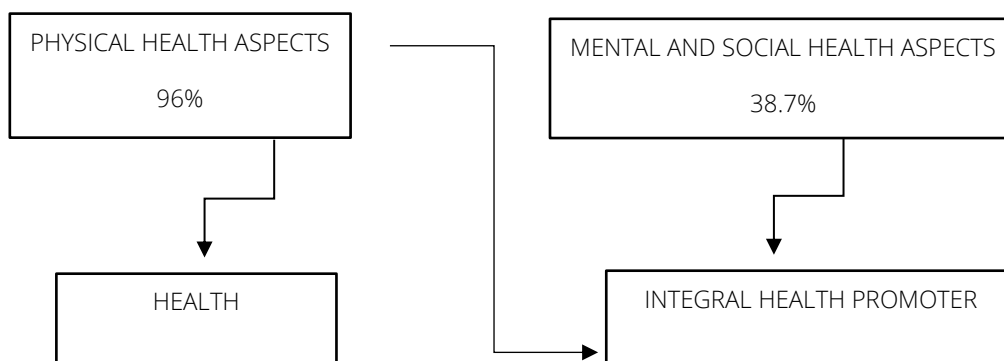
Table 2. Categories, subcategories, and frequency of response on what it means to be a dietitian according to Dietetics students (N=445). São Paulo, Brasil, 2015-2017.

| Role of dietitian | N | % |
|---|------------|-------------|
| Aspects relating to physical health | 427 | 96.0 |
| Self-esteem | 3 | 0.7 |
| Well-being | 1 | 0.2 |
| Science | 38 | 8.5 |
| Consumption / Eating | 208 | 46.7 |
| Disease | 65 | 14.6 |
| Pleasure | 3 | 0.7 |
| Quality of life | 2 | 0.4 |
| Health | 278 | 62.5 |
| Aspects relating to mental and social health | 172 | 38.7 |
| Socioeconomic aspects | 19 | 4.3 |
| Self-esteem | 5 | 1.1 |
| Well-being | 37 | 8.3 |
| Culture | 7 | 1.6 |
| Happiness | 13 | 2.9 |
| Pleasure | 30 | 6.7 |
| Psychology | 17 | 3.8 |
| Quality of life | 59 | 13.3 |
| Relationship with food | 29 | 6.5 |
| Relationship with body | 7 | 1.6 |

Fonte: Os autores, 2024.

Based on the categories of physical health, and mental and social health aspects, the students were divided into two groups according to their stated perception of what it means to be a dietitian: "Health promoter" and "Integral health promoter". The first comprised those who considered only the physical health aspects and the latter included students who considered both (all participants who considered mental and social health aspects also indicated physical health aspects).

Figure 2. Relationship between categories and what it means to be a dietitian.



Source: The authors, 2024.

Of the total students, 96% considered the dietitian as a health promoter (Table 2), with a focus on biological aspects, as we can see in the ACP's discourse (female, 23 years): "To promote healthy eating habits to promote and protect the health and the treatment of diseases".

On the other hand, 38.7% consider dietitians as Integral health promoters or promoters of holistic relationships to food, in a biopsychosocial perspective (Table 2), as described by LCR (female, 23 years):

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On the other hand, 38.7% consider dietitians as Integral health promoters or promoters of holistic relationships to food, in a biopsychosocial perspective (Table 2), as described by LCR (female, 23 years):

To respect the knowledge on the patient's dietary habits, complementing and helping him balance the foods intake, according to both his nutritional and socioeconomic and psychocultural needs to provide an appropriate diet according to his body type and quality of life.

PSC (female, 22 years) also had a discourse attached to this perspective: "To instruct and support people to have a healthy lifestyle, through which the relationship with healthy foods will be pleasant and the relationship with their own body is made of respect and love."

Regarding what it means to be a dietitian, self-esteem, well-being, pleasure, and quality of life seemed to appear in some discourses relating to the Biological aspects and others relating to the psycho-social aspects, like that of LPH (female, 22 years): "To provide well-being by working on health prevention/promotion, lightness for a less-stressful life, with functional foods and the pleasure of eating properly".

Call attention to mention pleasure in eating properly, but not pleasure related to sensorial characteristics, memories and social events.

The number of individuals who considered the dietitian as a promoter of integral health was greater in public educational institutions than those in private (67.3% *versus* 33.5%, respectively; $p < 0.001$). No association was found with sex.

DISCUSSION

This study evaluated Brazilian Dietetics students concerning the main role of eating, and what being a dietitian. It can be inferred that for most participants food is reduced to its biological dimension and physiological effects, and that the dietitian is understood as a health promoter – in a reductionist way. Besides evaluating a little explored theme, the study has the merit of a sample of students from various institutions, of adequate size to the exploration performed, and seeking associations with sociodemographic characteristics. As far as it is known, this is the first study assessing such factors among Dietetics students.

In the perspective of biological function, eating seems to aim for these students to provide energy, nutrients, and organic benefits²¹ to a body identified as a "domicile of nutrients",¹³ or a medicalized body²². The emphasis given to food based on medical-nutritional rationality²³ is legitimized by the scientific knowledge

on the chemical composition of foods and body metabolism. Studies worldwide and not restricted to Dietetics students also indicated that individuals associate food directly with the health and maintenance of the body²⁴ and women are more likely to establish this relationship.^{22,25} A study conducted with the Brazilian population showed that nearly half of them consider that eating is “above all a biological need”.²⁶

However, dietitians should work with a holistic approach to eating and their patients. In this study, only a small portion considered food from a Biopsychosociocultural perspective. Unlike the purely biological perspective, in this approach the biological aspect is not disconnected from the hedonistic, gustatory, social, cultural, emotional, and/or symbolic dimensions but it appears to be part of a sociocultural normative system that does not depend only on scientific medical principles.

Even considering the curricular guidelines of the Nutrition course, there seems to be a weakness in the human and social training of nutritionists aimed at healthcare.²⁷ Regarding the question about the view of dietitians, among those that considered dietitians just as a health promoter (in a reduced way), the statements emphasized health, disease, eating habits, and science. This view may be associated with a perception of food and eating restricted to biological aspects, influenced by the logic of food medicalization. In this biological bias, the dietitian assumes the role of a “biological engineer”, who is supposed to ensure optimal physiological benefits to individuals. Among those participants who considered a dietitian as a promoter of integral health, the role of the professional is to consider all elements related to the individual. In this approach, a socio-cultural normative system is considered, and the “nutritional” level is considered as much as the “eating” level, the latter including the various dimensions of eating. When the dietitian assumes this role, it is believed that it is possible to establish a dialogue between the scientific knowledge, sociocultural standards, and the individual’s daily reality.

For some students, the mention of self-esteem, well-being, pleasure, and quality of life seem to be related only to the biological aspects: it is not just the pleasure of eating but also rather “the pleasure of eating healthfully”. It means a kind of pleasure that comes from the act of conforming to precise nutritional standards and manage to shape body and health. These universes merge giving new senses to eating and the dietitian role, making pleasure associated with aesthetic and subordinated to nutritional ideals (“eat properly”, “functional foods”).

The fact that more than half of the students who indicated a broader role of eating also considered a broader role of a dietitian is interesting because it indicates that if actions were put into practice to foster an integral vision, they could also favor new nutritional interventions detached from the “reductionist nutritional approach”.²¹ Such a line is necessary because of the new, or increased challenges that these professionals have dealt with, such as chronic diseases, eating disorders, and obesity – conditions that are associated not only with biological problems but also sociocultural and psychological ones.²²

It can be believed that the perception of mainly biological aspects of eating can be reinforced by educational institutions, through the curricula of the undergraduate Dietetics courses. In Brazil, many disciplines focus on biological aspects of nutrition throughout the training period.²⁹ Although disciplines such as Psychology, Anthropology, and Sociology of Nutrition should also be present in the courses of Dietetics in Brazil, they are usually limited to a short period, they are seen as less interesting³⁰ and poorly integrated with other disciplines, disconnected from the professional practice.²⁹ Thus, Dietetics students and dietitians may have concepts more focused on nutrients and the biological function of food – and a perception of the dietitian as just a health promoter.²⁹ But we should also not disregard that this conception is internalized by the population in general, especially among women,^{24,25} and present in the media. This reality is related to Fischler’s concept of dietary cacophony,⁸ defined as the confusing and often contradictory noise one

encounters from various sources about what and how to eat. In this sense, it would be appropriate to question whether students did not already have this perspective before the course, which could have influenced their professional choice and the training in Nutrition would not have changed these perceptions and would not have promoted a more multidimensional view of eating.

The differences found in relation to the type of institution should be problematized. In Brazil, public educational institutions have much more difficult selection examination and offer fewer places for new students compared to private institutions. And even with curriculum guidelines for the undergraduate course in Nutrition in Brazil, it is known that the time available and focused on a deeper sociocultural discussion within this course "of the biological area" varies between institutions – which can impact the training and critical look of the student to food. Still, even in the existence of public policies aimed at greater democratization of access to public universities, a difference in profile – economic, social, and cultural – may exist between those who enter public or private universities, even different opportunities during graduation (such as research and extension activities) that may also impact the student's view of the topic of food and nutrition broadly. This fact should be further explored in future investigations. In any case, this difference found here should serve as an opportunity for educators and managers to question the dietitian we are training in Brazil and worldwide. The national curriculum guidelines for the Nutrition course were instituted by the Ministry of Education in 2001.²⁹ Since then, the main content is no longer focused on subjects, duration and workload, but on the delineation of the professional profile, on what should govern the practice and on required competencies and skills – organized according to the areas biological and health sciences, social sciences, humanities and economics, food and nutrition sciences, and food science. Although we may observe advances in these guidelines, there were protests from the Federal Council of Nutrition about the omission of a minimum workload. In addition, it is questionable whether this guideline format truly achieves the necessary space for broader discussions about the role of the professional and the worldviews, health, and nutrition that he or she brings with them as baggage, and that they carry with them after graduation.

Some limitations of this study should be considered: it is a cross-sectional, exploratory study, although conducted with dietetics students from the entire state of São Paulo it is a non-probabilistic sample (although it has an acceptable level of statistical significance, as calculated for the sample effect size and power), and that regardless of students' opinions, practice may be different from the norm, or from actual behavior.³¹ We must emphasize that the state of São Paulo has the highest Human Development Index in the country³² and the greatest number of students enrolled in undergraduate dietetics courses so,³³ the present results could not be expanded to total Brazilian dietetics students, and even less for all the students in the world.

It should also be noted that several other factors not discussed here could influence perceptions of the role of food and what it means to be a dietitian, such as the media, the social-historical context and personal issues. Besides, data collected online may limit the understanding of the discourses, since it cannot be deepened (although it allows having a more expressive number of participants). The starting questions for this study are quite specific and allow for space-limited answers, unlike in-depth interviews, in a more classical qualitative approach – which may be the goal of future study.

Additional studies should be conducted to broaden the knowledge of these aspects to understand better the relationship among these factors, also using other methodologies and culturally diverse samples.

CONCLUSIONS

The results indicate that for this group of Brazilian Dietetics students is mainly related to biological aspects and that the dietitians perceived as a health promoter in a "reductionist" way. It brings up the need

to discuss and expand these conceptions during academic training allowing bridges with the knowledge and methodologies of the humanities and social sciences so that more critical and complex approaches are introduced or emphasized. This perspective could make possible a biopsychosociocultural approach of food, and of the dietitian as a promoter of integral health, necessary for a multidimensional approach to contemporary food issues crossed by social, cultural, economic, and political factors.

PSC (female, 22 years) also had a discourse attached to this perspective: "To instruct and support people to have a healthy lifestyle, through which the relationship with healthy foods will be pleasant and the relationship with their own body is made of respect and love."

Regarding what it means to be a dietitian, self-esteem, well-being, pleasure, and quality of life seemed to appear in some discourses relating to the Biological aspects and others relating to the psycho-sociocultural aspects, like that of LPH (female, 22 years): "To provide well-being by working on health prevention/promotion, lightness for a less-stressful life, with functional foods and the pleasure of eating properly".

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The number of individuals who considered the dietitian as a promoter of integral health was greater in public educational institutions than those in private (67.3% *versus* 33.5%, respectively; $p < 0.001$). No association was found with sex.

DISCUSSION

This study evaluated Brazilian Dietetics students concerning the main role of eating, and what being a dietitian. It can be inferred that for most participants food is reduced to its biological dimension and physiological effects, and that the dietitian is understood as a health promoter – in a reductionist way. Besides evaluating a little explored theme, the study has the merit of a sample of students from various institutions, of adequate size to the exploration performed, and seeking associations with sociodemographic characteristics. As far as it is known, this is the first study assessing such factors among Dietetics students.

In the perspective of biological function, eating seems to aim for these students to provide energy, nutrients, and organic benefits²¹ to a body identified as a "domicile of nutrients",¹³ or a medicalized body²². The emphasis given to food based on medical-nutritional rationality²³ is legitimized by the scientific knowledge on the chemical composition of foods and body metabolism. Studies worldwide and not restricted to Dietetics students also indicated that individuals associate food directly with the health and maintenance of the body²⁴ and women are more likely to establish this relationship.^{22,25} A study conducted with the Brazilian population showed that nearly half of them consider that eating is "above all a biological need".²⁶

However, dietitians should work with a holistic approach to eating and their patients. In this study, only a small portion considered food from a Biopsychosociocultural perspective. Unlike the purely biological perspective, in this approach the biological aspect is not disconnected from the hedonistic, gustatory, social, cultural, emotional, and/or symbolic dimensions but it appears to be part of a sociocultural normative system that does not depend only on scientific medical principles.

Even considering the curricular guidelines of the Nutrition course, there seems to be a weakness in the human and social training of nutritionists aimed at healthcare.²⁷ Regarding the question about the view of dietitians, among those that considered dietitians just as a health promoter (in a reduced way), the

statements emphasized health, disease, eating habits, and science. This view may be associated with a perception of food and eating restricted to biological aspects, influenced by the logic of food medicalization. In this biological bias, the dietitian assumes the role of a “biological engineer”, who is supposed to ensure optimal physiological benefits to individuals. Among those participants who considered a dietitian as a promoter of integral health, the role of the professional is to consider all elements related to the individual. In this approach, a socio-cultural normative system is considered, and the “nutritional” level is considered as much as the “eating” level, the latter including the various dimensions of eating. When the dietitian assumes this role, it is believed that it is possible to establish a dialogue between the scientific knowledge, sociocultural standards, and the individual’s daily reality.

For some students, the mention of self-esteem, well-being, pleasure, and quality of life seem to be related only to the biological aspects: it is not just the pleasure of eating but also rather “the pleasure of eating healthfully”. It means a kind of pleasure that comes from the act of conforming to precise nutritional standards and manage to shape body and health. These universes merge giving new senses to eating and the dietitian role, making pleasure associated with aesthetic and subordinated to nutritional ideals (“eat properly”, “functional foods”).

The fact that more than half of the students who indicated a broader role of eating also considered a broader role of a dietitian is interesting because it indicates that if actions were put into practice to foster an integral vision, they could also favor new nutritional interventions detached from the “reductionist nutritional approach”.²¹ Such a line is necessary because of the new, or increased challenges that these professionals have dealt with, such as chronic diseases, eating disorders, and obesity – conditions that are associated not only with biological problems but also sociocultural and psychological ones.²²

It can be believed that the perception of mainly biological aspects of eating can be reinforced by educational institutions, through the curricula of the undergraduate Dietetics courses. In Brazil, many disciplines focus on biological aspects of nutrition throughout the training period.²⁹ Although disciplines such as Psychology, Anthropology, and Sociology of Nutrition should also be present in the courses of Dietetics in Brazil, they are usually limited to a short period, they are seen as less interesting³⁰ and poorly integrated with other disciplines, disconnected from the professional practice.²⁹ Thus, Dietetics students and dietitians may have concepts more focused on nutrients and the biological function of food – and a perception of the dietitian as just a health promoter.²⁹ But we should also not disregard that this conception is internalized by the population in general, especially among women,^{24,25} and present in the media. This reality is related to Fischler’s concept of dietary cacophony,⁸ defined as the confusing and often contradictory noise one encounters from various sources about what and how to eat. In this sense, it would be appropriate to question whether students did not already have this perspective before the course, which could have influenced their professional choice and the training in Nutrition would not have changed these perceptions and would not have promoted a more multidimensional view of eating.

The differences found in relation to the type of institution should be problematized. In Brazil, public educational institutions have much more difficult selection examination and offer fewer places for new students compared to private institutions. And even with curriculum guidelines for the undergraduate course in Nutrition in Brazil, it is known that the time available and focused on a deeper sociocultural discussion within this course “of the biological area” varies between institutions – which can impact the training and critical look of the student to food. Still, even in the existence of public policies aimed at greater democratization of access to public universities, a difference in profile – economic, social, and cultural – may exist between those who enter public or private universities, even different opportunities during graduation (such as research and extension activities) that may also impact the student’s view of the topic of food and

nutrition broadly. This fact should be further explored in future investigations. In any case, this difference found here should serve as an opportunity for educators and managers to question the dietitian we are training in Brazil and worldwide. The national curriculum guidelines for the Nutrition course were instituted by the Ministry of Education in 2001.²⁹ Since then, the main content is no longer focused on subjects, duration and workload, but on the delineation of the professional profile, on what should govern the practice and on required competencies and skills – organized according to the areas biological and health sciences, social sciences, humanities and economics, food and nutrition sciences, and food science. Although we may observe advances in these guidelines, there were protests from the Federal Council of Nutrition about the omission of a minimum workload. In addition, it is questionable whether this guideline format truly achieves the necessary space for broader discussions about the role of the professional and the worldviews, health, and nutrition that he or she brings with them as baggage, and that they carry with them after graduation.

Some limitations of this study should be considered: it is a cross-sectional, exploratory study, although conducted with dietetics students from the entire state of São Paulo it is a non-probabilistic sample (although it has an acceptable level of statistical significance, as calculated for the sample effect size and power), and that regardless of students' opinions, practice may be different from the norm, or from actual behavior.³¹ We must emphasize that the state of São Paulo has the highest Human Development Index in the country³² and the greatest number of students enrolled in undergraduate dietetics courses so,³³ the present results could not be expanded to total Brazilian dietetics students, and even less for all the students in the world.

It should also be noted that several other factors not discussed here could influence perceptions of the role of food and what it means to be a dietitian, such as the media, the social-historical context and personal issues. Besides, data collected online may limit the understanding of the discourses, since it cannot be deepened (although it allows having a more expressive number of participants). The starting questions for this study are quite specific and allow for space-limited answers, unlike in-depth interviews, in a more classical qualitative approach – which may be the goal of future study.

Additional studies should be conducted to broaden the knowledge of these aspects to understand better the relationship among these factors, also using other methodologies and culturally diverse samples.

CONCLUSIONS

The results indicate that for this group of Brazilian Dietetics students is mainly related to biological aspects and that the dietitians perceived as a health promoter in a "reductionist" way. It brings up the need to discuss and expand these conceptions during academic training allowing bridges with the knowledge and methodologies of the humanities and social sciences so that more critical and complex approaches are introduced or emphasized. This perspective could make possible a biopsychosociocultural approach of food, and of the dietitian as a promoter of integral health, necessary for a multidimensional approach to contemporary food issues crossed by social, cultural, economic, and political factors.

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Contributors

Koritar P, Gaspar MCMP and Alvarenga MS participated in conceiving the study, developing the methods and research questions; Koritar P contributed with acquisition of data; Koritar P and MCMP Gaspar participated in organization of data bank and its analysis and interpretation. Alvarenga MS and Killinger CL participated in the interpretation and critical revision. All authors read and approved the final manuscript.

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