

Relevant factors to healthy eating and to be healthy from the perspective of Nutrition students

Fatores relevantes para uma alimentação saudável e para estar saudável na perspectiva de estudantes de Nutrição

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Abstract

Introduction: Healthy eating is one of health determinants and the understanding of Nutrition students about healthy eating will guide their professional practice. *Objectives:* To evaluate factors considered relevant to healthy eating and to be healthy, attitudes towards eating, body and the nutritionist among Nutrition students. *Methodology:* 472 students (mean 23.4 years old) from 39 institutions in 23 cities in the state of São Paulo participating in the Nutritionist Health Study (NutriHS) answered questions, in order of importance, about factors for healthy eating and to be healthy, attitudes towards eating, body and nutritionists. Factors were ranked by weighted frequency; attitudes and factors were evaluated by mean and standard deviation and differences between the groups were assessed by the Kruskal-Wallis test. *Results and Discussion:* The main factors for healthy eating - eating unprocessed and *in natura* foods, eating with pleasure, and respecting signs of hunger and satiety; and the main ones for being healthy - eating healthy and practicing physical activity - were aligned with guidelines and consensus; but 48.8% agreed that nutritionists should be examples of good shape; and 41.9% that studying Nutrition increased their guilt when eating. *Conclusions:* Although the main answers about healthy eating and being healthy are in line with recommendations, attitudes regarding eating, body and the nutritionist should be discussed in academic education, due to their possible impact on future professional practice.

Keywords: Health. Feeding. Nutritional Sciences. Students.

Resumo

Introdução: A alimentação saudável é um dos fatores determinantes da saúde; e o entendimento de estudantes de Nutrição sobre alimentação saudável norteará sua prática profissional. *Objetivos:* Avaliar fatores considerados relevantes para uma alimentação saudável e para estar saudável, atitudes com relação à alimentação, ao corpo e ao nutricionista entre estudantes de Nutrição. *Metodologia:* 472 estudantes (média 23,4 anos) de 39 instituições em 23 cidades do estado de São Paulo participantes do Estudo de Saúde dos Nutricionistas (NutriHS) responderam, por ordem de importância, sobre fatores para uma alimentação saudável e para estar saudável, atitudes com relação à alimentação, ao corpo e ao nutricionista. Os fatores foram ordenados por meio de frequência ponderada; atitudes e fatores foram avaliados por média e desvio padrão e diferenças entre os grupos foram avaliadas pelo teste Kruskal-Wallis. *Resultados e Discussão:* Os principais fatores para uma alimentação saudável - comer alimentos *in natura* e pouco processados, comer com prazer e respeitar os sinais de fome e saciedade - e os principais para estar saudável - comer de forma saudável e praticar atividade física - estão alinhados com guias e consensos; mas 48,8% concordaram que nutricionistas devem ser exemplo de boa forma; e 41,9%, que estudar Nutrição aumentou sua culpa ao comer. *Conclusões:* Embora as principais respostas para uma alimentação saudável e estar saudável estejam alinhadas às recomendações, atitudes com relação à alimentação, ao corpo e ao nutricionista que emergiram devem ser discutidas na formação acadêmica pelo possível impacto na prática profissional futura.

Palavras-chave: Saúde. Alimentação. Ciências da Nutrição. Estudantes.

Introduction

The word *health* derives from the Greek *holos*, whole, entirety;¹ it is a complex concept defined by the World Health Organization, in a utopic and simplistic manner,^{1,2} as “a state of complete physical, mental and social well-being, and it does not only consist of the absence of disease or infirmity.”³ However, the relationship between food and health is well-established. Healthy eating is a determining factor regarding health and one of the main goals of the activities that promote it.⁴

From an anthropological point of view, eating is obviously recognized as a vital biological function,⁵ but it is known that “in the act of eating, the biological man and the cultural and social man are strictly connected.”⁶ Thus, healthy eating must be understood as what is good for the

health, for the individual, and as mentioned in the *Dietary Guidelines for the Brazilian Population*,⁷ “it is a basic human right that guarantees permanent, regular, fair access to an eating practice that is adequate to biological and social aspects and it must be in accordance with special eating needs; it must have as a reference the eating culture and the gender, race and ethnical dimensions, it must be accessible physically and financially, there must be a balance between quantity and quality, catering to the principles of variety, balance, moderation and pleasure; and be based in productive practices that are adequate and sustainable.”

Although this definition is broad and holistic, the concepts, ideas and perceptions about what healthy eating is are variable. Historically, healthy eating has been putting an emphasis in biological characteristics, as proposed by Escudero in 1937 in the Laws of Feeding – with the classic definition that “a regular diet should be quantitatively sufficient, qualitatively complete, harmonious in its components and adequate to its finality and to the organism it is destined to.”⁸

This view of healthy eating has the tone of “nutritionism”, with more appreciation of nutrients and biological aspects.⁹ Currently, it is amplified by news release and excessive messages about Nutrition, eating and health in different channels, in a simplistic manner, oftentimes without scientific basis and according to what is trending.^{10,11} Concepts centered only in nutrients and in the biological role of food can create a confusion about what to eat,⁹ distancing people from other aspects that are involved in the attitudes and food consumption.

Eating attitudes are defined as “beliefs, thoughts, feelings, behavior and relationship with food”,¹² and evaluating them is important because from these attitudes it is possible to understand and predict behaviors.¹³

Even students and professionals of the health area, despite their academic background, may have concepts that are centered only in nutrients and in the biological role of food. Nutritionists are considered experts in healthy eating and it is believed that one can learn the most about such concepts by having an educational background in Nutrition. However, Nutrition students are immersed in the same environment and are subjected to the same influences that other people, modulating their eating attitudes. Some studies point that among Nutrition students, there is a bigger practice of eating restrictions aiming to maintain or lose weight,¹⁴ frequency of risk behavior related to eating disorders – including orthorexia nervosa –¹⁵ and dissatisfaction with the body.¹⁶ Despite this, they will be future health agents, responsible for acting in several areas that involve the “promotion, maintenance and recovery of health through eating”, according to the attributions of the profession as stated by the class council.¹⁷

Thus, to know the factors considered relevant for healthy eating and to be healthy, as well as ideas and perceptions related to the nutritionist and change in attitudes due to the graduation in Nutrition is important to the current scenario and to think about the contents and the focus of the academic education of the nutritionist.

Material and Methods

This study, with cross-sectional outline and prospective collection, is part of the “Cohort Study of Nutritionists’ Health – NutriHS”. Nutrition students of public and private institutions, from courses registered in the Ministry of Education in 2014 in the State of São Paulo (SP), were invited to participate after the consent of the course coordinators. Data collection was made online on the NutriHS website: <http://www.fsp.usp.br/nutrihs/>.

The calculation of the sample size was made taking into account the institutions with undergraduate courses in Nutrition in the state of São Paulo, recognized by the Ministry of Education, whose graduates in the years 2012 and 2013 joined the Regional Nutrition Council (RNC) of the 3rd Region and the mean of graduates of each institution that joined the RNC in 2012 and 2013. Also, the mean score of the Disordered Eating Attitude Scale – an instrument that evaluates eating attitudes¹¹ in a sample of nutritionists that participated in the research about the behavior of the orthorexia nervosa – served as a basis to calculate the size of the sample. The size of the sample of 360 students was calculated based on a trust coefficient of 95% and an estimation of error of 0.015.

Students between the ages of 18 and 30 that were willing to participate were included in the research; those that mentioned chronic diseases were excluded. For characterization, they were asked questions about the institution they attended (public or private), city where it is located, semester in the course (to evaluate according to the stage in the graduation course: beginning: 1st and 2nd years; end: 3rd, 4th and 5th years), age, weight, height (to calculate the Body Mass Index – BMI), gender, marital status and family income.

Considering the complexity of the evaluation of ideas and perceptions, and the nonexistence of specific instruments to understand the concept of healthy eating and what it means to be healthy, questions inspired in governmental documents, such as the *Dietary Guidelines for the Brazilian Population*,⁷ from the *World Health Organization*³ were used, and several other researches that in some way explored the theme related to eating attitudes,¹⁶⁻¹⁹ through closed questions.

One of the questions evaluated is the level of importance of healthy eating, based on a list of 14 factors (numbered from 1 to 14 according to relevance, being 1 the most important and 14 the least important). It was also listed 12 important factors to be healthy, the same way, from 1 to 12, according to the level of importance.

A list with assertions about desirable characteristics for nutritionists, change in attitude due to Nutrition studies and assertions about attitudes regarding food was made. The answers, according to the level of agreement, in a Likert scale of 5 points, varied from “strongly disagree” to “strongly agree”.

There were also assertions about different attitudes regarding food. These included assertions based on the *Dietary Guideline for the Brazilian Population*,⁷ questions from the *ORTO-15 – an instrument developed to evaluate the behavior of orthorexia nervosa*^{18,19} – from the subscale General Health Interest from the Health and Taste Attitude Scales (HTAS)^{20,21} – which evaluates attitudes related to health. The answers were also according to the Likert scale of 5 points.

The analysis of data was made with the SPSS version 21.0 (IBM Corporation, Armonk-NY, USA). A value of $p \leq 0.05$ was adopted as level of significance. The normality of the variables was evaluated by the Kolmogorov-Smirnov test. The questions of characterizations are presented according to frequency of answer or mean and standard deviation. The factors of relevance for healthy eating and to be healthy were organized by weighted frequency from the values attributed to the whole sample and according to the type of institution, stage in the graduation course and nutritional status. The mean and the standard deviation according to the institution, stage in the graduation course and classification of nutritional status were analyzed. As factor 1 was considered the most important and 14 (for healthy eating) or 12 (for being healthy) the least important, the lower the mean, the bigger is the importance given to the factor. The agreement assertions were analyzed by the mean, standard deviation and frequency of agreement for the general sample and according to the type of institution, stage in the graduation course and nutritional status. The effect of the groups on the variables was evaluated by the Kruskal-Wallis test due to the lack of normality of the sample. The correlation between the characteristics of the sample and the agreement assertions was tested by the Spearman Correlation.

The study was approved by the Committee of Ethics in Research of the Public Health College of the University of São Paulo, protocol number 44576515.0.0000.5421. The participants received information on the first page of the online research and gave consent to their participation by ticking “I accept”.

Results and Discussion

Four hundred and seventy-two Nutrition students were evaluated, from 39 institutions, located in 23 cities in the state of São Paulo. From these institutions, four were public; 80.1% of the total of students studied in private institutions; 51.1% were at the end of the graduation; 93.4% were female and 90.5% were single.

On chart 1 the characteristics of the sample are presented. Some differences were observed between students from public and private institutions.

The understanding of what is healthy eating is rarely evaluated, even among health professionals, nutritionists and Nutrition students, which will work having this notion as basis.

Chart 1. Characteristics of the sample regarding age. Body Mass Index (BMI). classification of nutritional status, year and semester at graduation and family income. São Paulo, SP. 2015.

Characteristics	General (N=472)	Public (N=94)	Private (N=378)	P
Age (years). Mean (SD)	23.4 (3.0)	23.3 (2.1)	23.4 (3.2)	0.524
BMI (kg/m ²). Mean (SD)	22.8 (3.1)	22.1 (3.6)	23.0 (4.1)	0.076
Underweight. N(%)	35 (7.4)	8 (8.5)	27 (7.1)	0.001
Eutrophic. N(%)	329 (69.7)	72 (76.6)	257 (68.0)	≤ 0.001
Overweight. N(%)	83 (17.6)	11 (11.7)	72 (19.0)	≤ 0.001
Obesity. N(%)	25 (5.3)	3 (3.2)	22 (5.8)	≤ 0.001
Beginning of course. N(%)	231 (48.9)	31 (33.0)	200 (52.9)	≤ 0.001
End of course. N(%)	241 (51.1)	63 (67.0)	178 (47.1)	≤ 0.001
< 1 Minimum-wage. N(%)	18 (3.8)	2 (2.1)	16 (4.2)	0.001
1-5 Minimum-wages. N(%)	308 (65.3)	38 (40.4)	270 (71.4)	≤ 0.001
6-10 Minimum-wages. N(%)	65 (13.8)	28 (29.8)	37 (9.8)	0.264
> 10 Minimum-wages. N(%)	39 (8.3)	18 (19.1)	21 (5.6)	0.631
Do not know. N(%)	42 (8.9)	8 (8.5)	34 (9.0)	≤ 0.001

Beginning of the course = 1st and 2nd years of graduation; End of the course = 3rd, 4th and 5th years of graduation.

The studies show a vision of healthy eating focused on dealing with biological needs, direct or indirectly dichotomizing food into healthy and unhealthy. In Brazil, a study made with health professionals defined healthy eating as “an eating condition that must be varied and balanced with nutrients; that offers benefits to health and is adequate to the nutritional needs of the individual for a healthy weight and that includes fresh, natural and whole foods.”²² In Canada, healthy eating was described by Nutrition students as that in which “there is consumption of all food groups of the food pyramid, [being] associated to moderation and a balanced diet; it must be individualized, pleasant and ‘make you feel good’.”²³ In England, an instrument was developed to evaluate the

perception of nutritionists about several foods from a dichotomous classification of food in healthy and unhealthy.²⁴ It is possible to observe the lack of studies and the focus on classification and on biological “functionality” of food.

This study aimed to cover this gap and explore, with different questions, the understanding of Nutrition students about healthy eating. It was possible to observe that for the more “obvious” questions (like listing the main factors related to healthy eating and living), the answers were adequate, aligned with the Dietary Guideline⁷ and the World Health Organization⁴. However, if educated laypeople were asked the same questions, they would have probably given similar answers. With the dissemination of content related to eating and Nutrition, people have knowledge and may even answer adequately, but several other factors, besides knowledge, may influence the dietary choice, such as flavor, appearance, price and social, cultural, psychological, economical and anthropological aspects.^{6,25-28}

The results here presented are the first ones of the study “*Healthy eating from the perspective of Nutrition graduation students in the State of São Paulo*”. The aim is to call the attention for an education in Nutrition that contemplates the current problematics, as well as the complexities of the eating attitudes and its influence on the performance of the professional.

In the analysis, students were compared according to the type of institution, stage in the graduation course and nutritional status. Some differences were observed on the answers related to the factors of relevance for healthy eating and being healthy, as well as attitudes related to eating, to the body and to the nutritionist among Nutrition students – most notably with differences related to the type of institution.

It is known that the type of institution can reflect many other questions involving economic, social and cultural aspects. Some of these aspects were approached superficially in this study, such as family income and educational level of the head of the family. Besides, it is known that many students choose Nutrition because of personal matters with food, weight, body shape and that the nutritional status can influence attitudes related to food, together with biological, psychological, anthropological, social, economic and cultural factors and by the interaction of these factors.²⁵⁻²⁸

Chart 2 shows the order of importance given to the factors for healthy eating and to be healthy.

Chart 2. Order of importance given to factors for healthy eating and to be healthy by Nutrition students, according to educational institution, stage at the graduation course and classification of the nutritional status. São Paulo, SP. 2015.

Order of Importance of Factors	Public (N=94)		Private (N=378)		Beginning (N=231)	End (N=241)	Under weight (N=35)		Regular weight (N=329)		OW (N=83)		Obes (N=25)	
	2	1	2	1			1	1	1	1	1	1	1	
1) Eating especially fresh/natural and low-processed/whole foods	2	1	2	1	1	1	1	1	1	1	1	1	1	
2) Eat with pleasure	1	2	1	2	2	3	2	2	2	2	2	2	2	
3) Respect the physiological signs of hunger and satiety	3	3	3	3	3	2	3	3	3	3	3	3	3	
4) Avoid industrialized foods	6	4	4	4	5	4	5	4	4	5	5	4	4	
5) Have contact with food and cook	4	6	4	6	4	5	4	5	5	4	4	4	8	
6) Eat according to the Food Pyramid	11	5	11	5	6	7	8	6	6	7	7	6	6	
7) Allow the consumption of all foods	5	8	5	8	8	6	7	7	7	6	6	5	5	
8) Eat preferably organic food	8	7	8	7	7	8	6	6	8	8	12	9	9	
9) Control ingestion of calories	9	9	9	9	9	9	13	9	9	9	9	7	7	
10) Restrict sugars	12	10	12	10	10	10	9	11	11	11	8	10	10	
11) Restrict fats	10	11	10	11	11	11	12	10	10	10	10	11	11	
12) Avoid carbohydrates, especially processed. Ex: white flours	13	12	13	12	12	13	10	12	12	11	11	13	13	
13) Eat sitting at a table without watching TV. computer. smartphones or cellphones	7	13	7	13	13	12	11	13	13	13	13	12	12	
14) Restrict compounds present in food. Ex: gluten and lactose	14	14	14	14	14	14	14	14	14	14	14	14	14	

continue

Order of Importance of Factors	Public (N=94)		Private (N=378)		Beginning (N=231)	End (N=241)	Under weight (N=35)			Regular weight (N=329)			OW (N=83)			Obes (N=25)				
	1	2	3	4			1	2	3	4	5	6	7	8	9	10	11	12	1	2
1) Eat healthily			3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2) Practice physical activity			5	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3) Be happy and have a less stressful life			1	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4) Have a respectful relation with your own body			2	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5) Have a pleasurable relation with food			4	5	6	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
6) Have clinical exams within normality			6	6	5	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5
7) Have adequate weight (within the eutrophic range)			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8) Have a diet rich in functional food			9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9) Have a diet without simple sugars and poor fats			10	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
10) Eat less and exercise more			8	10	11	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11
11) Control ingestion of food in order not to gain weight			11	11	10	11	10	10	10	10	10	10	10	10	10	10	10	10	10	10
12) Be thin and have a low percentage of fat			12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

Beginning of the course = 1st and 2nd years of graduation; End of the course: 3rd, 4th and 5th years of graduation; OW=overweight; Obes=obesity

Despite some differences in the order of the factors according to the type of institution, stage in the graduation course and nutritional status, overall, the main factors were similar between the groups.

The three main factors for healthy eating were the same: “eating especially fresh/natural and low-processed/whole foods”, “eating with pleasure” and “respecting the physiological signs of hunger and satiety”, even when in different orders. They indicate that aspects defended by the Dietary Guide⁷ are incorporated by Nutrition students.

Similarly, the classification of the main factors to be healthy was similar among the groups, with some differences in the order. Food and physical activity are the main risk factors for the development of non-communicable diseases⁴ – and they seem internalized by the students.

“*Healthy eating*” was considered the most important factor for students in private institutions in all stages of the graduation course and nutritional status. For students in public universities, “being happy and having a less stressful life” was considered the main factor to be healthy. “Practice physical activity” was among the five main factors to be healthy for all groups, with exception of the obese.

Chart 3 presents the effect of the type of institution, stage in the graduation course and nutritional status on the factors of importance for healthy eating.

Differences were observed in almost all factors according to the type of institution, in half of the factors according to the stage in the graduation course and only in one factor according to the nutritional status.

Chart 4 presents the effect of the type of institution and stage in the graduation course on the importance factors to be healthy.

Differences were observed in almost all the factors according to the type of institutions and in two factors according to the stage in the graduation course. No differences according to nutritional status were observed (data not presented).

Chart 5 presents the attitudes related to nutritionists and change in attitudes because of studying Nutrition.

Chart 3. Scoring of the factors for healthy eating for Nutrition students, according to educational institution, stage at the graduation course and nutritional status. São Paulo, SP, 2015.

Order of Importance	Public (N=94)		Private (N=378)		Beginning (N=231)		End (N=241)		Under weight (N=35)		Regular weight (N=329)		OW (N=83)		Obes (N=25)	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	p
Eating especially fresh/natural and low-processed/whole foods	4.0 (2.9)	5.2 (3.9)	0.058	5.3 (3.9)	4.6 (3.6)	0.074	4.3 (3.6)	4.9 (3.7)	5.4 (4.0)	4.4 (3.2)	0.521					
Respect the physiological signs of hunger and satiety	4.4 (3.0)	5.7 (3.6)	0.002	5.8 (3.6)	5.1 (3.3)	0.043	5.5 (3.4)	5.4 (3.6)	5.6 (3.5)	5.5 (3.1)	0.955					
Eat with pleasure	3.9 (3.5)	5.7 (4.1)	0.000	5.6 (4.2)	5.2 (3.8)	0.534	5.2 (3.8)	5.4 (4.0)	5.5 (4.4)	4.9 (4.0)	0.923					
Avoid industrialized foods	6.5 (3.1)	6.5 (3.9)	0.629	6.7 (3.7)	6.3 (3.7)	0.223	6.7 (4.1)	6.4 (3.7)	6.8 (3.9)	6.6 (3.2)	0.808					
Have contact with food and cook	4.9 (3.2)	6.9 (3.8)	0.000	6.6 (3.8)	6.4 (3.8)	0.359	5.5 (3.6)	6.6 (3.8)	6.2 (3.7)	7.4 (4.2)	0.234					
Eat according to the Food Pyramid	9.5 (3.1)	6.6 (3.6)	0.000	6.7 (3.8)	7.5 (3.6)	0.014	7.5 (3.9)	7.0 (3.7)	7.4 (3.6)	7.0 (3.8)	0.755					
Allow the consumption of all foods	5.0 (3.5)	7.7 (3.9)	0.000	7.7 (4.0)	6.6 (3.9)	0.004	7.5 (4.0)	7.2 (4.0)	6.9 (3.9)	6.9 (3.9)	0.842					
Eat preferably organic food	8.2 (2.7)	7.5 (3.5)	0.106	7.3 (3.4)	8.0 (3.3)	0.022	7.2 (3.5)	7.4 (3.4)	8.6 (3.2)	8.2 (3.4)	0.035					
Control ingestion of calories	9.4 (3.0)	7.7 (3.8)	0.000	7.7 (3.8)	8.4 (3.6)	0.066	9.2 (3.0)	8.1 (3.7)	7.6 (3.7)	7.1 (4.3)	0.138					
Restrict sugars	9.6 (2.6)	8.0 (3.5)	0.000	8.1 (3.5)	8.5 (3.3)	0.224	8.6 (3.4)	8.4 (3.4)	7.6 (3.4)	8.4 (3.6)	0.206					
Restrict fats	9.4 (2.8)	8.2 (3.6)	0.003	8.2 (3.6)	8.6 (3.4)	0.312	9.0 (3.5)	8.4 (3.5)	8.2 (3.4)	8.4 (3.7)	0.686					
Avoid carbohydrates, especially processed Ex: white flours	10.15 (2.9)	8.6 (3.3)	0.000	8.7 (3.2)	9.0 (3.2)	0.353	8.7 (3.7)	8.9 (3.2)	8.5 (3.1)	10.3 (3.0)	0.063					
Eat sitting at a table without watching TV, computer, smartphones or cellphones	7.8 (3.6)	9.6 (4.3)	0.000	9.8 (4.1)	8.8 (4.2)	0.004	8.9 (4.1)	9.4 (4.2)	9.1 (4.4)	8.8 (4.2)	0.842					
Restrict compounds present in food. Ex: gluten and lactose	12.4 (3.3)	11.2 (3.3)	0.000	10.8 (3.6)	12.1 (2.9)	0.000	11.1 (3.4)	11.5 (3.3)	11.6 (3.4)	10.9 (3.6)	0.794					

Beginning of the course 1st and 2nd years of graduation; End of course= 3rd, 4th and 5th years of graduation; OW=overweight; Obes=obesity

Mean: Minimum=1; Maximum=14. The importance given to the factors decreases from 1 to 14. Therefore, the lower the mean of the factor, the bigger its importance.

Chart 4. Scoring of factors related to being healthy for Nutrition students, according to educational institution and stage at the graduation course. São Paulo, SP, 2015.

Order of Importance	Public (N=94)		Private (N=378)		Beginning (N=231)		End (N=241)	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	p
Eat healthily	3.8 (2.4)	3.4 (2.9)	3.4 (2.9)	0.007	3.7 (3.1)	3.3 (2.5)	0.950	
Practice physical activity	4.7 (1.8)	4.9 (2.9)	4.9 (2.9)	0.326	4.9 (2.8)	4.8 (2.7)	0.648	
Be happy and have a less stressful life	3.4 (3.1)	5.4 (3.2)	5.4 (3.2)	0.000	5.0 (3.2)	4.9 (3.4)	0.631	
Have a respectful relation with your own body	3.5 (2.8)	5.3 (3.4)	5.3 (3.4)	0.000	5.2 (3.5)	4.7 (3.2)	0.153	
Have a pleasurable relation with food	3.9 (2.4)	6.0 (3.0)	6.0 (3.0)	0.000	5.9 (3.1)	5.2 (2.9)	0.017	
Have clinical exams within normality	6.1 (2.1)	5.9 (3.1)	5.9 (3.1)	0.373	5.7 (3.0)	6.2 (2.8)	0.085	
Have adequate weight (within the eutrophic range)	7.4 (2.1)	6.1 (3.2)	6.1 (3.2)	0.000	6.2 (3.0)	6.6 (3.1)	0.184	
Have a diet rich in functional food	8.7 (2.1)	7.0 (2.8)	7.0 (2.8)	0.000	7.0 (2.7)	7.6 (2.9)	0.016	
Have a diet without simple sugars and poor fats	9.2 (2.5)	7.8 (2.9)	7.8 (2.9)	0.000	8.2 (2.8)	7.9 (3.0)	0.386	
Eat less and exercise more	8.4 (2.9)	8.4 (3.1)	8.4 (3.1)	0.737	8.4 (3.1)	8.4 (3.0)	0.780	
Control ingestion of food in order not to gain weight	9.3 (2.5)	8.4 (2.8)	8.4 (2.8)	0.005	8.3 (2.9)	8.8 (2.6)	0.136	
Be thin and have a low percentage of fat	9.7 (2.7)	9.5 (3.0)	9.5 (3.0)	0.975	9.5 (3.1)	9.6 (2.8)	0.978	

Beginning of the course = 1st and 2nd years of graduation; End of the course = 3rd, 4th and 5th years of graduation; Mean: Minimum=1; Maximum=12. The importance given to the factors decreases from 1 to 12. Therefore, the lower the mean of the factor, the bigger its importance.

Chart 5. Attitudes regarding nutritionists and change in behavior due to educational background in Nutrition among Nutrition students, according to educational institution and nutritional status. São Paulo, SP, 2015.

Assertions	General (N=472)		Public (N=94)		Private (N=378)		Under weight (N=35)		Regular weight (N=329)		OW (N=83)		Obes (N=25)	
	Mean (SD)	I+2; 3; 4+5 (%)	Mean (SD)	p	Mean (SD)	p	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	p
Nutritionists should be thin	2.6 (1.1)	47.7; 30.9; 21.4	2.1 (1.1)	2.8 (1.0)	0.000	2.8 (1.0)	2.5 (0.9)	2.1 (1.3)	0.020					
Nutritionists should set the example of good physical shape	3.2 (1.2)	29.0; 22.2; 48.8	2.4 (1.2)	3.4 (1.1)	0.000	3.2 (1.1)	2.5 (1.5)	0.030						
Nutritionists should not eat "junk food"	2.3 (1.0)	67.2; 21.2; 11.6	1.7 (0.8)	2.4 (0.9)	0.000	2.2 (0.9)	2.4 (1.2)	0.840						
After I started studying Nutrition I worry more about my eating habits and weight	4.3 (0.8)	4.4; 8.9; 86.7	3.9 (0.9)	4.4 (0.8)	0.000	4.2 (0.8)	4.5 (0.7)	0.340						
Studying Nutrition changed my eating preferences	4.1 (1.0)	8.9; 12.7; 78.4	3.9 (1.1)	4.1 (0.9)	0.109	4.1 (1.0)	3.9 (1.2)	0.940						
After I started studying Nutrition I try to change eating habits of my family and close friends	4.1 (0.9)	6.8; 11.2; 82.0	3.8 (1.0)	4.2 (0.8)	0.000	4.1 (0.9)	4.1 (1.0)	0.860						
Studying Nutrition increased my guilt regarding food	3.1 (1.4)	39.0; 19.1; 41.9	2.6 (1.5)	3.2 (1.3)	0.000	3.0 (1.4)	3.5 (1.6)	0.000						

I + 2 = Strongly disagree and Disagree; 3 = Neutral; 4 + 5 = Agree and Strongly agree; OW=overweight; Obes=obesity; Mean: Minimum=1; Maximum=5. The lower the mean, the bigger the disagreement regarding the assertion; and the higher the mean, the bigger the agreement.

No significant correlations of the assertions were found about nutritionists and change in attitudes as a result of an educational background in Nutrition and attitudes related to eating and age, year in the graduation course, BMI, classification of the nutritional status and family income (data not presented). However, it is possible to observe some differences especially related to the type of educational institution.

The field of activity of the nutritionist has changed a lot over the last decades; many new areas and an interest in the potential of food in health have emerged, frequently emphasizing weight, physical shape and aesthetics. Besides, nutritionists are also on social media, publicizing their ideas and services. Because there are curricular guidelines and discipline syllabus to be followed, there is little or no room during graduation to talk about this scenario with the future professionals.

The frequency of agreement with “*nutritionists must be an example of good physical shape*” and “*nutritionists must be thin*” indicate a certain demand regarding the body of the nutritionist. Other studies show that body dissatisfaction is frequent among Nutrition students and nutritionists.^{16,29} The current appreciation of the ideal thinness and of being thin, sometimes mistaken with health, can contribute to this attitude related to the body of the professional.³⁰

There was a high rate of agreement with “*After I started studying Nutrition I worry more about my eating habits and my weight*”, with “*After I started studying Nutrition I try to change eating habits of my family and close friends*” and with “*Studying Nutrition changed my eating preference*” – with differences according to the type of institution for the first two, and between stages in the graduation course for the first, with bigger occurrence for students at the end of the graduation ($p=0,034$; data not presented). This result was partially expected because nutritional education aims to increase knowledge about eating and Nutrition, resulting in alterations on eating habits. However, it is necessary to pay attention to changes in eating preferences and in the tendency of dichotomizing food because pleasurable food is frequently perceived as not being healthy,³¹ and this view can cause feelings of anxiety and guilt, especially in women.³² Thus, this result should be carefully interpreted, because it is not possible to know if the preferences changed in order to approach the norms currently established, taking into account the amplitude of the aspects related to food.

The impact of food in the body, not only physiologically, can be important regarding feelings of guilt after eating.³³ The frequency of agreement with the statement “*studying Nutrition increased my feelings of guilt with food*” proves the conjectures made. Thus, somehow, the increase of knowledge acquired about Nutrition during the graduation course may not include the discussion about eating (and health) in its biological, psychological and sociocultural extent.

The answers to the assertions about attitudes related to food based on the *Brazilian Dietary Guideline*,⁷ on ORTO-15^{18,19} and HTAS^{20,21} are on chart 6, as well as the comparison according to the type of institution.

Chart 6. Attitudes regarding eating habits among Nutrition students according to nutritional status. São Paulo, SP, 2015.

Assertions	Total (N=472)		Public (N=94)	Private (N=378)	P
	Mean (SD)	1+2; 3; 4+5 (%)	Mean (SD)	Mean (SD)	
Healthy eating should focus on natural and minimally processed foods ^a	4.4 (0.8)	4.7; 2.5; 92.5	4.5 (0.7)	4.4 (0.8)	0.302
To eat healthily it is important to give preference to organic foods and avoid genetically modified ones ^a	3.7 (1.0)	14.4; 20.8; 64.7	3.3 (1.1)	3.8 (1.0)	0.000
Taking time to eat, cook, and value the meals is important to have healthy eating habits ^a	4.6 (0.5)	0.4; 1.5; 98.1	4.7 (0.5)	4.6 (0.6)	0.059
Eating behavior – how, when, with whom, why, in what way - you eat is as or more important than what or how much you eat ^a	3.9 (1.0)	11.9; 13.8; 74.3	4.4 (0.8)	3.8 (1.0)	0.000
The pleasure in eating and appreciation of psychosocial aspects of food make a difference for a healthy life ^a	4.5 (0.6)	1.3; 3.8; 94.9	4.7 (0.5)	4.4 (0.7)	0.000
Currently, the use of food supplements is necessary to have a healthier life and stay in shape.	2.0 (0.9)	76.4; 16.6; 7.0	1.5 (0.7)	2.1 (0.9)	0.000
My eating choices are conditioned by my concerns regarding my health ^b	3.7 (0.9)	13.2; 16.6; 70.2	3.5 (1.1)	3.8 (0.9)	0.005
The flavor of the food is more important than the quality when I evaluate it ^b	2.2 (0.9)	72.4; 19.5; 8.1	2.6 (0.9)	2.1 (0.8)	0.000
I believe my mood affects my eating behavior ^b	4.2 (0.9)	8.3; 5.9; 85.8	4.3 (0.9)	4.1 (0.9)	0.035
I believe the conviction of eating only healthy food improves my self-esteem ^b	3.4 (1.1)	21.0; 26.5; 52.4	2.8 (1.1)	3.6 (1.0)	0.000
I believe that consuming healthy food improves the way I look ^b	4.3 (0.8)	2.3; 8.7; 88.8	3.9 (0.9)	4.4 (0.7)	0.000
I am very concerned about how healthy the food is ^c	3.7 (0.9)	13.0; 18.9; 68.2	3.2 (1.0)	3.8 (0.9)	0.000
I always follow a healthy and balanced diet ^c	3.0 (1.0)	37.4; 29.9; 32.7	2.8 (1.0)	3.0 (1.0)	0.204

continue

Assertions	Total (N=472)		Public (N=94)	Private (N=378)	P
	Mean (SD)	1+2; 3; 4+5 (%)	Mean (SD)	Mean (SD)	
It is important to me that my diet is poor in fat ^c	2.8 (1.0)	43.5; 25.5; 31.0	2.4 (0.9)	3.0 (1.0)	0.000
It is important to me that my daily diet includes a lot of vitamins and minerals ^c	4.2 (0.8)	3.6; 8.7; 87.7	4.0 (0.9)	4.2 (0.7)	0.053
I eat what I like, and I do not worry how healthy the food is ^c	2.2 (0.9)	70.5; 21.4; 8.0	2.3 (0.9)	2.1 (0.9)	0.035
How healthy is a certain type of food does not impact my choices ^c	2.0 (0.8)	81.3; 11.9; 6.8	2.1 (0.9)	2.0 (0.8)	0.557
How healthy snacks are does not make a difference to me ^c	2.1 (0.9)	74.9; 15.3; 9.8	2.4 (1.1)	2.1 (0.8)	0.005
I do not avoid any kind of food, except those that might elevate my cholesterol ^c	2.4 (1.1)	63.5; 16.3; 20.2	2.9 (1.3)	2.3 (1.0)	0.000

^a based on the Dietary Guideline to the Brazilian Population (2014); ^b based on ORTO-15 (Donini et al., 2005; Alvarenga et al., 2012); ^c based on HTAS 1 + 2 = Strongly Disagree and Disagree; 3 = Neutral; 4 + 5 = Agree and Strongly Agree; Mean: Minimum=1; Maximum=5. The lower the mean, the higher the disagreement regarding the assertion; and the higher the mean, the higher the agreement.

For almost all the assertions, differences between the type of educational institution were observed. For students at the beginning and at the end of graduation, differences were found not only for “to eat healthily it is important to give preference to organic food and avoid genetically modified ones” ($p=0,026$), “the use of food supplements is necessary to have a healthier life and stay in shape” ($p=0,025$), “I believe the conviction of eating only healthy food increases my self-esteem” ($p=0,004$), “I believe that consuming healthy food improves the way I look” ($p=0,010$), with a higher mean of agreement for students at the beginning of the graduation course (data not demonstrated).

When comparing the students according to nutritional status, differences were observed for “*I believe my mood affects my eating behavior*”, with a higher mean of agreement among those who are overweight or obese ($p=0,022$) and for “*I always follow a healthy and balanced diet*”, with a higher mean of agreement among students with lower weight and eutrophic ($p=0,002$) – data not demonstrated.

The answers to the assertions about attitudes related to eating evidenced a concern over the adoption of healthy eating habits. The increase of concern over eating and weight is sometimes perceived as a positive result, but without exploring this concern and the behaviors it generates. It could be in fact negative, since these matters emphasize nutrients in general and reflect nutritionism. According to this doctrine, food is seen as the sum of its nutrients, leaving aside important aspects, even the flavor, which is not seen as a genuine guide in the food choice.⁹

Still, the obsessive concern over adopting a healthy diet, many times associated to the idea that healthy eating improves self-esteem, is responsible for the body image, with a judgement over moral values about the way of eating – observed, for example, in the desire to change the diet of family and close friends. These signs are an indication of orthorexia nervosa, but such behavior, more frequent in students and health professionals that study Nutrition, sometimes goes unnoticed because the search for healthy eating is encouraged by society to reach health, well-being and longevity.^{18,34}

During the graduation in Nutrition, we receive several information from “disciplinary and normative” guides and consensus. The data on this study point that factors seen as adequately approached during academic education – like the message that *in natura* and low-processed foods must be stimulated as part of healthy eating – are interiorized. However, when this idea is explored indirectly with questions that are not so obvious, others emerge.

The curricular guidelines of the Nutrition course in Brazil puts emphasis in the biological aspect of eating.³⁵ Contents related to Psychology, Sociology and Anthropology are restricted to a short period of the course,³⁵ and may be underexplored together with content related to the professional practice, without enabling an integration of this knowledge or the creation of complex

thinking.³⁶ In addition to that, there is the lack of spaces to discuss concepts and preconceptions of the students, reinforcing the focus currently valued, according to which health and eating habits are strongly medicalized and connected to aesthetics.^{2,37}

Conclusion

Apart from the information given and acquired during the graduation course, future nutritionists will work based on their understanding of what is healthy eating. Academic education should have a more relevant and differentiated role – not only discussing the current science but also critically discussing the profile of the future nutritionist, as well as the diversity of factors that influence the attitudes and choices regarding food and the relation of these with the understanding of what is healthy eating.

Some limitations should be considered: this is a cross-sectional and exploratory study, and even though it was made with Nutrition students from the state of São Paulo, it is a non-probabilistic sample (although it has adequate level of statistical significance, size of effect and power observed in the sample calculation made). One should pay attention to the difference between the number of students from public and private institutions, as well as the classifications of nutritional status (despite being a reflex of reality). Besides, it should be considered that the perception of what is healthy eating is influenced by a series of other factors that were not approached in this study – like a socio-historical context, in addition to “personal questions”.

New studies should be made to broaden the understanding of the concept of healthy eating, as well as better understanding the relation between the factors evaluated. Either way, potentialities can be highlighted: it is the first study in Brazil that evaluates such factors among Nutrition students and brings up the fact that they seem to incorporate the main messages from guides and normative consensus regarding food and health, although it indicates the need to explore and studies regarding attitudes related to food and body during academic education – because they can have an impact in the health of the population in future professional practices.

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Contributors

Koritar P was responsible for the elaboration of the project, collection and analysis of data, writing and discussion of manuscript; Alvarenga MS contributed with the elaboration of the project, discussion and review of the manuscript.

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