https://doi.org/10.1590/1678-9865202134e200258

ORIGINAL

Clock hours of food and nutrition education in curricula of undergraduate nutrition programs: a two-country comparison

Horas de instrução de educação alimentar e nutricional nos currículos de cursos de graduação em nutrição: comparação entre dois países

Isabela Cicaroni OTTONI[1] 0000-0002-6920-1295
Bruno Miguel Paz Mendes de OLIVEIRA[1] 0000-0002-7710-4284
Daniel Henrique BANDONI[2] 0000-0003-1638-1437
António Pedro Soares Ricardo GRAÇA[1] 0000-0002-6262-4658

[1] Universidade do Porto, Faculdade de Ciências da Nutrição e Alimentação, Programa de Pós-Graduação em Ciências da Nutrição e Ciências Naturais. Rua do Campo Alegre, n. 823, 4150-180 Porto, Portugal. Correspondence to I.C. OTTONI. Email: <isabela_ottoni@hotmail.com>.

[2] Universidade Federal de São Paulo, Instituto de Saúde e Sociedade, Programa de Pós-Graduação em Alimentos, Nutrição e Saúde. Santos, São Paulo, Brasil.

Article elaborated from the theses by I. C. OTTONI, entitled "Nutritionists´ training in Food and Nutrition Education: a comparative analysis of curricula of undergraduate nutrition programs between Brazil and Portugal". Universidade do Porto, 2020.

How to cite this article
Ottoni IC, Oliveira BMPM, Bandoni DH, Graça APSR. Clock hours of food and nutrition education in curricula of undergraduate nutrition programs: a two-country comparison. Rev Nutr. 2021;34:e200258. https://doi.org/10.1590/1678-9865202134200258

https://doi.org/10.1590/1678-9865202134e200258

ABSTRACT

Objective

To make a critical and comparative analysis of curricula of Brazilian and Portuguese higher education institutions in terms of clock hours and semester distribution of food and nutrition education in undergraduate nutrition programs, also assessing the main differences among courses classified into thematic axes and professional practice areas.

Methods

The curricula of fifteen Brazilian and eleven Portuguese nutrition programs were collected and classified into thematic axes and professional practice areas with the method of Document Analysis. Next, we performed statistical analysis regarding the total and proportional clock hours of instruction and their semester distribution to assess the differences between the two countries. The variables of interest were the hours of Food and Nutrition Education and their semester distribution.

Results

The Food and Nutrition Education axis was the second smallest one, with statistically significant differences among the axes (2.2% of curricula; $p<0.001$). Brazilian higher education institutions showed greater total clock hours of Food and Nutrition Education ($p=0.018$), Human and Social Sciences ($p=0.003$), Public Health ($p<0.001$), as well as a wider dispersion and lower relative weighted mean for the semester offering of courses ($p=0.004$) of Food and Nutrition Education courses. Portuguese higher education institutions showed greater total and proportional clock hours of instruction for Exact Sciences ($p<0.005$; $p=0.001$, respectively) and more proportional hours of Biologic and Health Sciences ($p<0.001$).

Conclusion

Our study found a reduced presence of the area of Food and Nutrition Education in the undergraduate training of nutritionists in both countries.

Keywords: Curriculum. Food and nutrition education. Higher education institutions. Nutritionist.

RESUMO

Objetivo

Realizar uma análise crítica e comparativa das horas de instrução e distribuição semestral da Educação Alimentar e Nutricional nos cursos de graduação em nutrição. Além disso, analisar as principais diferenças entre disciplinas classificadas em Eixos Temáticos e em Áreas De Atuação Profissional de currículos de cursos de nutrição das Instituições de Ensino Superior brasileiras e portuguesas.

Métodos

Os currículos de quinze instituições brasileiras e onze portuguesas foram coletados, e o método Análise Documental foi usado para classificar as disciplinas de cada curso em Eixos Temáticos e em Áreas de Prática Profissional. Em seguida, foi feita uma análise estatística das horas de aula totais e proporcionais e do semestre de oferta, para verificar a diferença entre os países. As horas de instrução de Educação Alimentar e Nutricional e a distribuição semestral foram as variáveis de interesse.

Resultados

O eixo Educação Alimentar e Nutricional foi o segundo menor, com diferença estatisticamente significativa entre eixos (2,2% dos currículos; p<0,001). As Instituições de Ensino Superior brasileiras apresentaram maior carga horária absoluta para Educação Alimentar e Nutricional (p=0,018), Ciências Humanas e Sociais (p=0,003) e Saúde Pública (p<0,001), e maior dispersão e menor média ponderada relativa de localização do curso (p=0,004) para as disciplinas de Educação Alimentar e Nutricional. As Instituições de Ensino Superior portuguesas apresentaram maior carga horária absoluta e proporcional em Ciências Exatas (p<0.005; p=0,001 respectivamente) e maior proporcional em Ciências Biológicas e da Saúde (p<0.005).

Conclusão

Este estudo encontrou uma presença reduzida da área de Educação Alimentar e Nutricional na formação de nutricionistas em ambos os países.

Palavras-chave: *Currículo. Educação Alimentar e Nutricional. Instituições de Ensino Superior. Nutricionista.*

INTRODUCTION

Food and Nutrition Education (FNE) is a determinant tool for health workers to promote autonomous, healthy, and sustainable eating behaviors and food and nutritional security [1-3]. FNE is described in public health policies worldwide as educational strategies that facilitate the voluntary adoption of healthy food choices [4]. It is a compulsory subject in university curricula in Brazil [1,5]. In Portugal, FNE is taught in the course of Community Nutrition [6].

In Brazil, there are four essential contents in the education of nutritionists: Biological and Health Sciences; Social, Human, and Economic Sciences; Food and Nutrition Sciences; and Food Sciences [5].

In 2016, the Portuguese Order of Nutritionists published its Reference for Academic Nutritionist Training defining essential contents and its minimum and maximum European Credit Transfer and Accumulation System (ECTS) values, for a total of 240 ECTS: Natural and Exact Sciences (min 20; max 30); Social Sciences (min 10; max 15); Medical and Health Sciences (min 35; max 60); Nutrition Sciences (min 90; max 150); Internship (min 30; max 30) [7].

In Brazil, studies seem to agree that there is a hegemony of the biological Cartesian model, with the predominance of biological sciences in the university curricula, which is often fragmented [8-10].

Therefore, this article aims to make a critical and comparative analysis of clock hours of instruction and the semester distribution of Food and Nutrition Education in undergraduate nutrition programs, as well as to assess the main differences among courses classified into thematic axes and professional practice areas in curricula of Brazilian and Portuguese Higher Education Institutions (HEI).

METHODS

This is a comparative study that used Document Analysis [11]. The data collection took place from September 2018 to July 2019. The websites of the Portuguese *Direção Geral do Ensino Superior* (DGES, Directorate General for Higher Education) and the Brazilian *Ministério da Educação* (MEC, Ministry of Education), which rank HEI based on pedagogical aspects, were consulted for information on which HEI offered undergraduate nutrition programs. In 2018, there were 709 in-person nutrition programs in Brazil, but only eleven in Portugal [12]. All Portuguese HEI, four public and seven private, and thirteen public and two private Brazilian HEI were selected. The inclusion criteria for the Brazilian sample were the highest-ranked Brazilian HEI that offered certified undergraduate nutrition programs and provided online data on FNE courses and pedagogical curricula. Polytechnic institutions and Distance Learning Programs were not included.

The Clock Hours of Instruction (CHI) of each course in the HEI curricula and their syllabuses were collected from the official websites of the institutions, from their Political-Pedagogical Projects (registered between 2014-2018) for Brazilian institutions, and from the Orders (2005-2018) published in the Government Gazette of Portugal for Portuguese institutions. Each course was classified into a thematic axis adapted from Canesqui and Garcia [13] and the Portuguese Reference for Academic Nutritionist Training, according to a syllabus analysis, as follows: Biological and Health Sciences; Exact Sciences; Food and Nutrition Education; Human and Social Sciences; Professional Sciences; Professional within social and human sciences; Other [7].

Then, Professional Sciences and Professional within social and human sciences courses were reassessed and classified into professional practice areas, according to the Reference for Academic Nutritionist Training and the *Conselho Federal de Nutricionistas* (CFN, Federal Board of Nutritionists), as follows: Clinical Nutrition; Food Marketing; Food Technologies and Industry; Nutrition and Food Services; Public Health; Sports Nutrition; Teaching and Research [7,14].

https://doi.org/10.1590/1678-9865202134e200258

Internships were not analyzed; however, their CHI were included in the total amount. Analyses were made of the total and proportional CHI of each thematic axis and professional practice area, as well as of their distribution along academic semesters. We computed the mean semester of courses in FNE weighted by the CHI in each semester, divided by the duration of the program in semesters. The CHI and distribution of FNE were the variables of interest.

The data was processed with the IBM SPSS version 25.0 for Windows (SPSS Inc, Chicago) statistical software. Descriptive statistics were used for assessing means and minimum and maximum values, or relative or absolute frequencies. The Shapiro-Wilk test of normality was used, and we found that most variables did not follow a normal distribution [15]. Therefore, the nonparametric Mann-Whitney test for independent samples was used to compare the two countries [16]. The nonparametric Friedman test was used to check for differences between the thematic axes or the professional practice areas [16].

The method of Document Analysis was used for assessing public domain information. Consent forms were not necessary for this study. The anonymity of the studied HEI was preserved.

RESULTS

The Biological and Health Sciences axis and the field of Clinical Nutrition were predominant, as shown in Figures 1 and 2. The differences in CHI found between Brazil and Portugal for thematic axes and professional practice areas can be seen in Tables 1 and 2. Figure 3 shows the CHI for each FNE course according to HEI, semester of offering, and country.

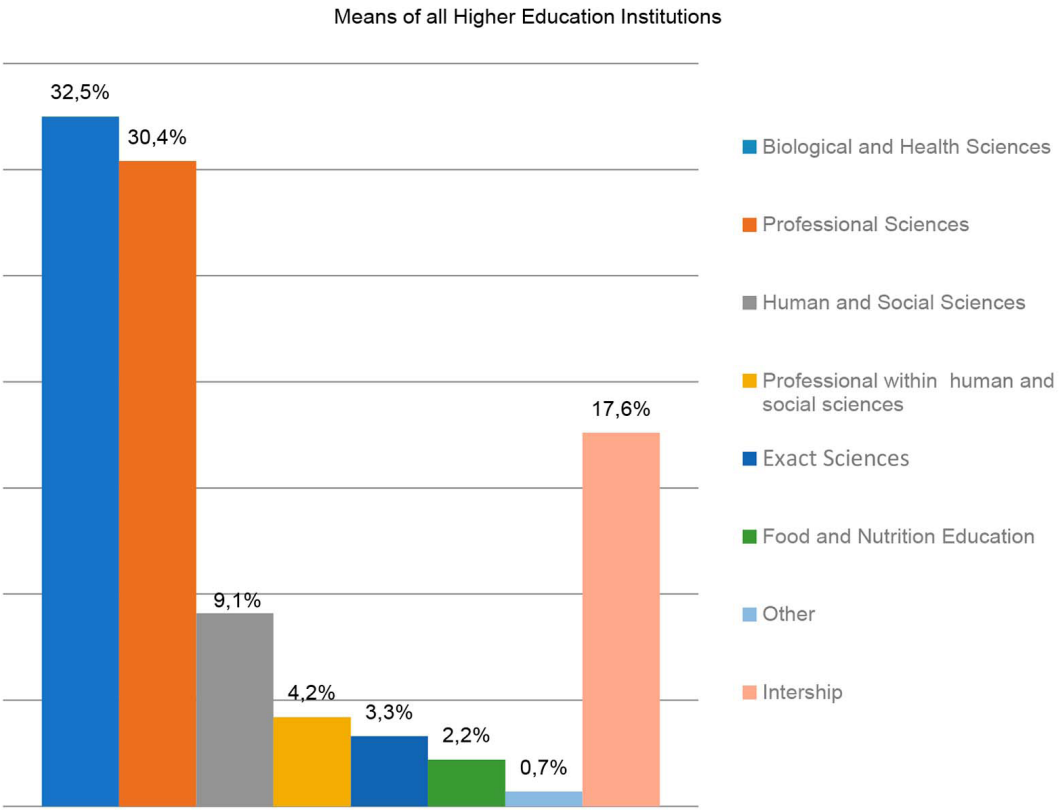

Figure 1 – Mean rank for thematic axes in Brazil and Portugal according to proportional Clock Hours of Instruction, 2019. (n=26).

Note: Friedman test $p<0.001$, difference between axes; Other: Portuguese, English, theological anthropology, training practices, information technologies, integrated practices; Total including Clock Hours of Internship: 3199 hours, mean of all Higher Education Institution.

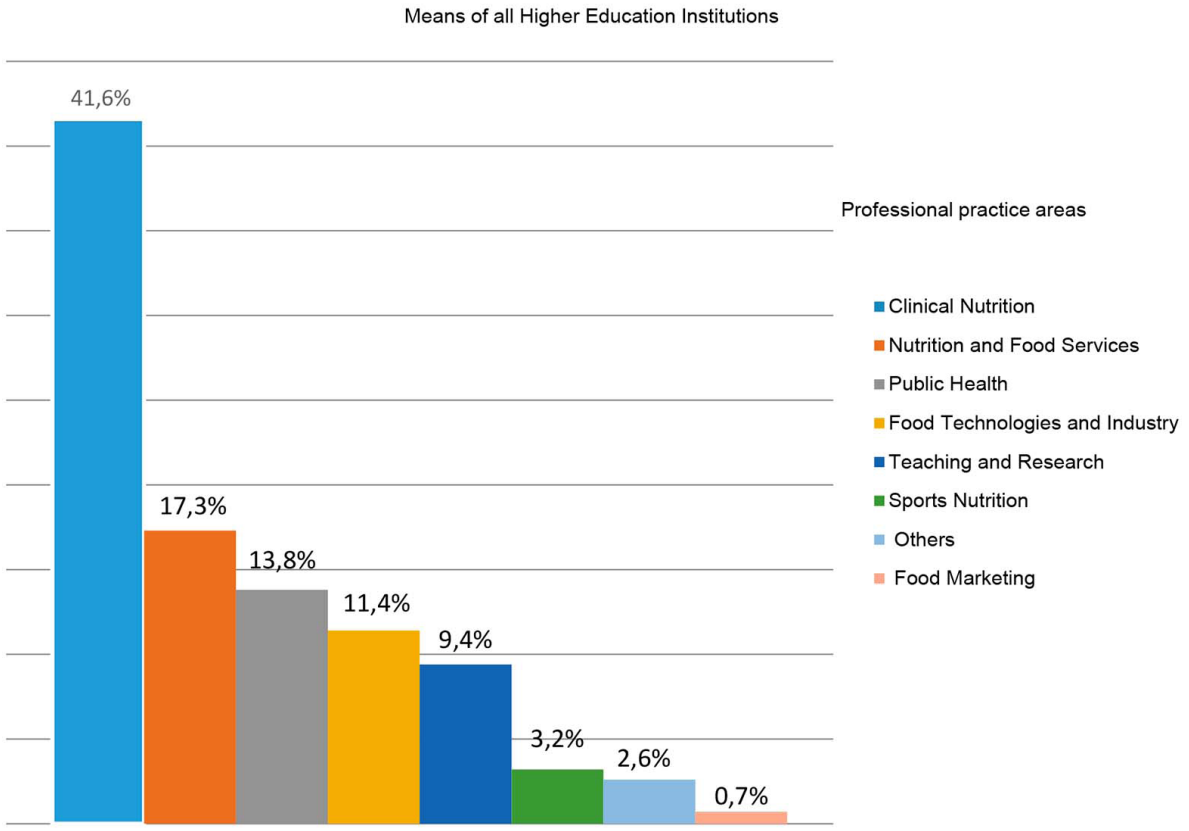

Figure 2 – Mean rank for professional practice areas in Brazil and Portugal according to proportional Clock Hours of Instruction, 2019. (n=26).

Note: Friedman test $p<0.001$, difference between axes; Others: Introduction to Nutrition, Oriented Practice, Professional Ethics; Total: Professional Sciences + Professional within social and human sciences: 1098.5 hours, mean of all Higher Education Institution.

Table 1 – Distribution of total and proportional Clock Hours of Instruction according to thematic axes and country, 2019. (n=26)

Thematic axes	Country							
	Brazil				Portugal			
	Mean	min	max	%	Mean	min	max	%
Food and Nutrition Education	86.8*	0	160	2.4%	50.0*	0	104	1.9
Human and Social Sciences	348.0*	180	570	9.7	212.5*	104	462	8.4
Biological and Health Sciences	990.9	660	1360	27.6**	1032.0	823	1757	39.3**
Exact Sciences	60.8*	0	165	1.7**	142.5*	60	173	5.4**
Professional Sciences	1069.1*	825	1440	29.9%	813.9*	487	1050	31.0
Professional within human and social sciences	175.9*	60	300	4.8%	84.8*	48	120	3.3%
Other	14.7	0	150	0.4	36.3	0	157	1.2%
Total:	3601.2**	2655	4262	100	2650.5**	1868	3469	100%

Note: CHI: Clock Hours of Instruction per Higher Education Institutions; Total amount includes CHI of internships. Other: Portuguese, English, theological anthropology, training practices, information technologies, integrated practices. % Proportion of CHI to the total curricula, including internships; Mann-Whitney Test for the comparison between the two countries: *$p<0.05$; **$p<0.001$.

https://doi.org/10.1590/1678-9865202134e200258

Table 2 – Distribution of total and proportional Clock Hours of Instruction according to professional practice area and country, 2019. (n=26).

Professional Practice Areas	Country							
	Brazil				Portugal			
	Mean	min	max	%	Mean	min	max	%
Nutrition and Food Services	190.3	108	320	15.4*	173.3	90	232	19.9*
Clinical Nutrition	517.3*	384	700	41.8	379.6*	182	660	41.4
Public Health	210.5**	80	468	16.8*	84.8**	48	120	9.7*
Teaching and Research	150.5*	0	340	11.8	60.1*	0	105	6.0
Food Technologies and Industry	90.3*	0	224	7.6	142.5*	75	260	16.6*
Sports Nutrition	38.9	0	160	2.9	33.3	0	75	3.6%
Food Marketing	2.1	0	32	0.2	14.1	0	45	1.4%
Others	44.9*	0	180	3.5	11.1*	0	45	1.3*
Total	1244.9**	960	1520	100	898.7**	535	1155	100

Note: CHI: Clock Hours of Instruction per Higher Education Institutions; Others: Introduction to Nutrition, Oriented Practice, Professional Ethics. Total: Professional Sciences + Professional within social and human sciences. % Proportion of CHI to the total amount for Professional Sciences + Professional within social and human sciences; Mann-Whitney Test for the comparison between the two countries: *p<0.05; **p<0.001.

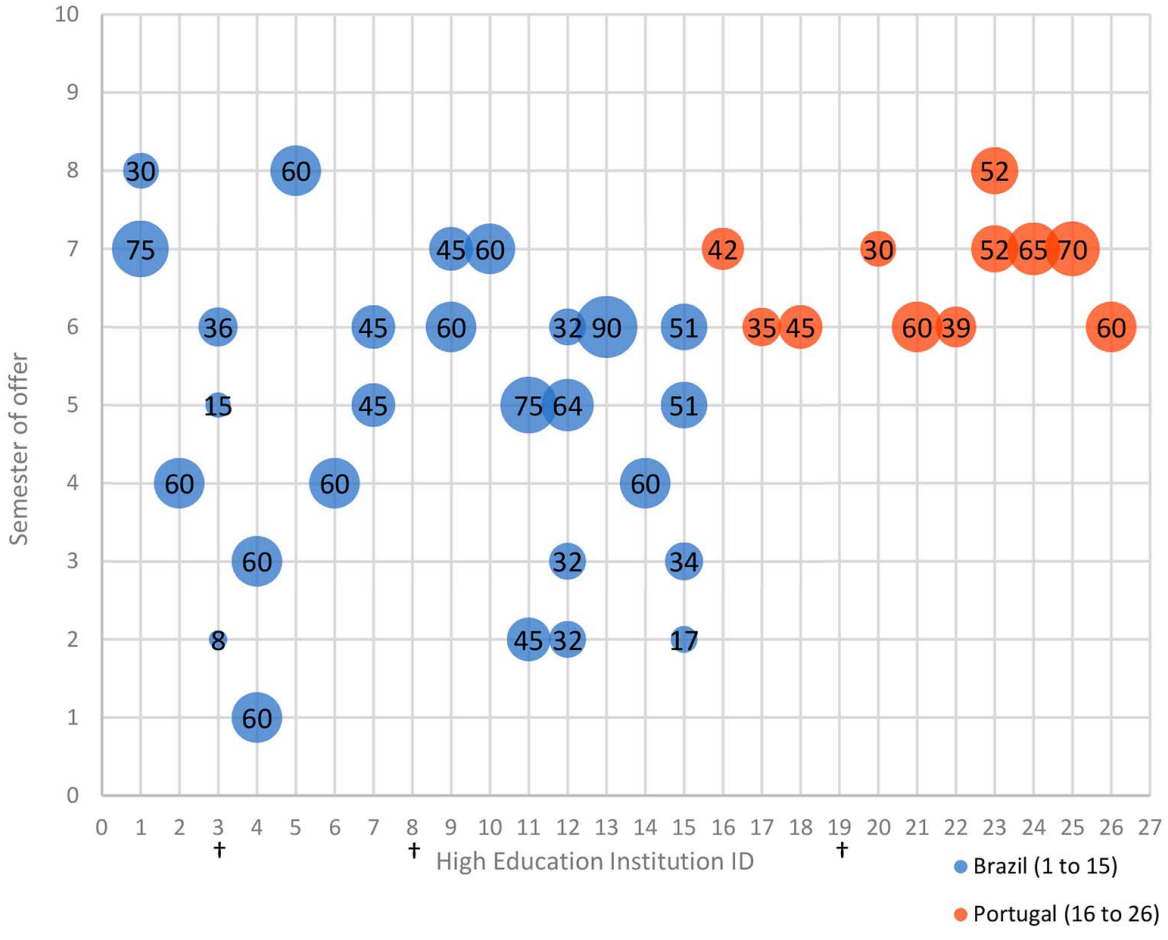

Figure 3 – Distribution of Clock Hours of Instruction of Food and Nutrition Education courses by semester according to countries, 2019.

Note: n=26; *p*: 0.004; for the comparison between Brazil and Portugal of the relative weighted mean of FNE for semester of offer of courses. †HEI without specific FNE courses.

DISCUSSION

There was a predominance of courses in the Biological and Health Sciences and Professional Sciences axes in both countries, which is indicative of a professional profile centered on technical training and biological perspective, and of courses aimed at Clinical Nutrition, followed by Nutrition and Food Services – areas that employ most nutritionists and that receive a greater number of CHI at universities [8,17-20]. Among the main professional practice areas, Public Health had the smallest number of CHI. The number of nutritionists working in the National Health Service in Portugal and the *Sistema Único de Saúde* (SUS, Unified Health System) in Brazil is smaller than what is considered adequate and may have a relevant effect on the nutritionists' training [21-23]. The biologist approach, or "nutritionism", when food is understood as its nutrient profile at the expense of its social, human, and symbolic context, seems to prevail [24].

Both countries offered few CHI for FNE and Professional within social and human sciences when compared to the other axes. Technical and biological knowledge is indispensable [25]. However, the study of social and psychological aspects of food consumption, the complexity of food choices, and their relationship with food systems are necessary [26]. Such subjects are developed mainly in Human and Social Sciences, Public Health, and Professional within social and human sciences courses [3,27-29].

We found fewer CHI for FNE when compared to the other axes [30]. There was no statistically significant difference in proportional CHI for FNE. As learning happens in real hours of work, Brazilian nutritionists might have more opportunities to learn FNE procedures, as they approach the subject for almost twice as much time (in classroom hours) than Portuguese nutritionists. Portuguese HEI establish their CHI based on ECTS. Total CHI and contact/classroom CHI are presented separately in class plans. We only analyzed contact/classroom CHI.

Most programs had restricted loads for the study of human and social sciences, which are related to the development of FNE skills [3,13,27,28]. In 2005, a study conducted in Brazil provided further insights into how social and human sciences were developed throughout the curricula of nutrition programs; the Biological and Health Sciences axis had the highest number of CHI (max-26.57%), while the Human and Social Sciences axis (max-8.58%) had the lowest. However, nutrition has to be associated with its socio-cultural dimensions to complement its biological expression [13,31].

On average, there are fewer total CHI in undergraduate nutrition programs than in other health-related fields [29]. Brazil had a higher rate of total CHI than Portugal, which may allow more flexibility in the universities' curricula. FNE was offered in more semesters and courses in Brazil. Together with a higher amount of CHI for FNE, Human and Social Sciences, Public Health, and Professional within social and human sciences courses, this fact may deepen the understanding and practice of FNE.

One should consider when and for how long each course is taught, as they rely on background knowledge. The understanding of food, nutrition, and human behavior sciences is essential for FNE [26]. As learning happens continuously and permanently, having more semesters offering the same theme in different ways may be more efficient to promote the abilities required for practice [27].

The studied Brazilian HEI showed higher CHI rates for the FNE, Human and Social Sciences, and Professional within social and human sciences axis. This is probably influenced by the several pedagogical reformulations that took place since the establishment of the first nutrition undergraduate program in 1939, which in turn were fostered by discussions about the role of nutritionists in ensuring food and nutrition security [13,18,23]. Brazil has profound inequalities due to its colonial history and land size and is marked by the prevalence of hunger and a rapid increase in obesity rates, both results of food insecurity. In the last decades, the country has sought to respond to such problems in a pioneering and comprehensive manner, with public health policies and changes in the training of health professionals, although setbacks in recent years threaten these advances [32]. All the studied Brazilian institutions offered the axes determined by CNE/CES Resolution [5]. Nevertheless, as there are no recommended CHI intervals, making universities and faculties autonomous, we could not determine the adequacy of our sample to these parameters [33].

The studied Portuguese institutions were in agreement with the Reference for Academic Training of Nutritionists, thus maintaining the proportion between the axes [7]. The first program in Portugal opened in 1976, and for more than twenty years, it was the only one [34]. It may have settled the professional profile and training, explaining its hegemony over Portuguese programs.

Medical sciences were the core of nutrition sciences from the beginning in both countries. Nutrition shares these sciences' reductionist approach and the cartesian model. However, to reverse current unhealthy eating habits, nutritionists need to understand the determinants of food consumption and take FNE as a process that goes beyond merely providing information [4]. This requires thorough assessments of the pedagogical curricula to break with the current paradigms of public assistance and promote the formation of autonomous, humanist, and critical professionals.

Our sample had different total amounts of CHI, and the curricula from distinct HEI had different lengths (in semesters), so we presented the CHI proportionally. Moreover, courses might include FNE concepts even if they are not explicitly stated on their syllabi. That may have led to an underestimation of the proportion of FNE, especially for the programs which computed zero CHI for FNE. As a compulsory subject in nutritionist training, it may appear as a transversal area and not as an autonomous course.

There were 709 in-person nutrition undergraduate programs in Brazil in 2018, of which only 77 were public institutions [12]. This prevents the generalization of the results, for there are far more private HEI in Brazil than public ones, and we analyzed only the better-ranked ones, which are usually public. However, we had at least two HEI from each great region of Brazil, except for the North, and our methods and results can be used in further and more comprehensive studies.

CONCLUSION

Undergraduate nutrition programs were similar in Brazilian and Portuguese HEI regarding the proportional CHI for each thematic axis and professional practice area. Notwithstanding, they were different in terms of contact/classroom hours of work/learning and distribution of FNE along the academic semesters. We found a predominant approach based on the technical aspects of the profession, centered on a biological model.

This study was the first to address CHI and semester distribution of FNE in undergraduate nutrition programs. Nutritionists' work practice involves intensive interventions to modify individual and collective eating behavior, as well as knowledge of FNE foundations. However, our study found a reduced presence of this area both in Portugal and in Brazil.

CONTRIBUTORS

IC OTTONI contributed to the conception and design of this study, interpretation of results, manuscript writing, and final revision. BMPM OLIVEIRA contributed to the design of this study, interpretation of results, and final revision. DH BANDONI and APSR GRAÇA contributed to the conception and design, interpretation of results, manuscript writing, and final revision.

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Received: October 22, 2020
Final version: April 20, 2021
Approved: May 26, 2021