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Twenty years of the Postgraduate Program in Nutrition at the Federal University of Santa Catarina: analysis of dissertations and theses

Vinte anos do Programa de Pós-Graduação em Nutrição da Universidade Federal de Santa Catarina: análise das dissertações e teses

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ABSTRACT

Objective

To perform a descriptive analysis of the methodological characteristics of the dissertations and theses produced by the Postgraduate Program in Nutrition of the Federal University of Santa Catarina.

Methods

Bibliometric analysis of postgraduate dissertations and theses. The search for graduates was conducted until December 31, 2022, through queries to the Graduate Monitoring System and University Institutional Repository.

Results

A total of 323 dissertations and theses presented over the 20 years of the postgraduate program were reviewed. The majority was produced by nutritionists (89.0%, n=244). There was a predominance of the Dietary and Biochemical Study line related to nutritional status (47.0%, n=152), followed by the lines of Nutrition in Meal Production and Eating Behavior (27.9%, n=90) and Nutritional Diagnosis and Intervention in Collectivities (25.1%, n=81). The majority of studies were quantitative (79.0%, n=255) and observational (75.0%, n=244), investigating the adult and elderly population (41.0%, n=133), particularly the local population (78.0%, n=252). Among 30 central themes, the most researched were obesity (12.0%, n=38), methods and evaluation of food consumption (10.0%, n=34), functional foods and bioactive compounds (10.0%, n=33), food system, sustainability and food and nutritional security (8.0%, n=25) and nutritional therapy (7.0%, n=23). In the last five years, research has begun on new themes, such as Nutrition in neuroscience and sports, and meta-research in Nutrition.

Conclusion

The postgraduate program contributed to predominantly train nutritionists, developing studies on topics of interest to the science of Nutrition on a global scale. There is a greater local, regional and national vocation in the development of quantitative observational studies, especially with the adult and elderly population.

Keywords: Dissertations. Nutrition. Post-Graduate. Research. Theses.

RESUMO

Objetivo

Realizar análise descritiva das características metodológicas das dissertações e teses produzidas pelo Programa de Pós-Graduação em Nutrição da Universidade Federal de Santa Catarina.

Métodos

Realizou-se análise bibliométrica das dissertações e teses produzidas pelo programa de pós-graduação. A busca dos egressos ocorreu até o dia 31 de dezembro de 2022, a partir de consultas ao Sistema de Acompanhamento de Egressos e ao Repositório Institucional da universidade.

Resultados

Foram analisadas 323 dissertações e teses defendidas nos 20 anos do programa de pós-graduação, desenvolvidas majoritariamente por nutricionistas (89,0%, n=244). Houve predominância da linha de Estudo Dietético e Bioquímico relacionado ao estado nutricional (47,0%, n=152), seguida pelas linhas de Nutrição em Produção de Refeições e Comportamento Alimentar (27,9%, n=90) e de Diagnóstico e Intervenção Nutricional em Coletividades (25,1%, n=81). A maioria dos estudos foi do tipo quantitativo (79,0%, n=255) e observacional (75,0%, n=244), investigando a população de adultos e idosos (41,0%, n=133), sobretudo a população local (78,0%, n=252). Das 30 temáticas centrais, as mais investigadas foram obesidade (12,0%, n=38), métodos e avaliação do consumo alimentar (10,0%, n=34), alimentos funcionais e compostos bioativos (10,0%, n=33), sistema alimentar, sustentabilidade e segurança alimentar e nutricional (8,0%, n=25) e terapia nutricional (7,0%, n=23). Nos últimos cinco anos, iniciaram-se pesquisas com novas temáticas, tais como Nutrição em neurociência e no esporte, e metapesquisa em Nutrição.

Conclusão

O programa de pós-graduação apresentou contribuição à formação predominante de nutricionistas, desenvolvendo estudos em temáticas de interesse da ciência da Nutrição em âmbito global. Destaca-se maior vocação local, regional e nacional no desenvolvimento de estudos quantitativos observacionais, sobretudo com população adulta e idosa.

Palavras-chave: Dissertações. Nutrição. Pós-Graduação. Pesquisa. Teses.

INTRODUCTION

Stricto sensu postgraduate studies in Nutrition began in Brazil in 1971, with the implementation of the Master's Degree Course in Nutrition at the Universidade Federal de Pernambuco (UFPE, Federal University of Pernambuco) [1-5]. Twenty years later, in 1991, the first doctoral courses in Nutrition began, one at UFPE and two others in the state of São Paulo, at the Universidade de São Paulo (USP, University of São Paulo) and at the Universidade Federal de São Paulo (UNIFESP, Federal University of São Paulo) [1]. Between 1971 and 2011, that is, over the course of four decades, 25 *stricto sensu* postgraduate courses in Nutrition were created in this country, 18 of which yielded master's degrees and seven doctoral degrees, all linked to public higher education institutions [2-5].

The year 2011 represented another important milestone for *stricto sensu* postgraduate studies in Nutrition in Brazil. Until that time, *stricto sensu* postgraduate programs were allocated to the Nutrition subarea, located within the area called Medicine II of the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Coordination for the Improvement of Higher Education Personnel) [1-5]. At the III Forum of Coordinators of Postgraduate Programs in Nutrition, held in 2008 in Brasília, it was proposed that the area of Nutrition be separated from the area of Medicine II,

based on the conclusion that the field of Food and Nutrition had already reached scientific maturity that justified the creation of its own area within CAPES [3]. This proposal was justified both by the identity of the field, which could not be viewed solely from a biomedical perspective, and by the density of training of increasingly qualified human resources for higher education and research in Food and Nutrition [3]. Therefore, in response to the demands of researchers and other players in the field, based on the Ministry of Education (MEC)/CAPES Ordinance No. 83, of June 6, 2011, a specific area for Nutrition was created at CAPES [4].

Since the creation of the Nutrition area, there has been a significant increase in the number of *stricto sensu* postgraduate courses in this country. It is worth noting that, in May 2023, 34 *stricto sensu* postgraduate programs in Nutrition were linked to the CAPES Nutrition assessment area, 30 of which offered academic master's degrees, four offered professional master's degrees, and 14 offered academic doctorates [5]. It is noteworthy that all *stricto sensu* postgraduate programs in Nutrition aimed at academia were located in public universities and concentrated mainly in the Southeast Region of Brazil, which represented 43.3% (n=13) of the programs. However, in the North Region of the country, there were still no *stricto sensu* postgraduate programs in Nutrition [6,7].

The Programa de Pós-Graduação em Nutrição da Universidade Federal de Santa Catarina (PPGN/UFSC, Postgraduate Program in Nutrition at the Federal University of Santa Catarina) began its journey in 2002, with the admission of the first class of the master's course. In March 2012, with the rise to concept 4 in the CAPES evaluation, the doctoral course began and at that time that was the first course of its kind in the Southern Region [4,5]. In the last four-year evaluation by CAPES (2017-2020), it maintained its concept at four [5].

The PPGN/UFSC has as its general objective "scientific training, developing capacity and autonomy for research, teaching and innovation, generating knowledge and social impact in an interdisciplinary area involving the interface of Food, Nutrition and Health" [8]. In this connection, it is composed of three lines of research: I – Nutritional Diagnosis and Intervention in Collectivities; II – Dietary and Biochemical Study related to nutritional status; and III – Nutrition in Meal Production and Eating Behavior [9].

Given the 20 years of operation of the PPGN/UFSC, completed in 2022, we identified an opportunity to review the production of scientific knowledge generated by the program and its consequent contribution to CAPES Nutrition. In a non-exhaustive bibliographic search, we sought to identify studies in the literature that addressed the analysis of theses and dissertations within the scope of *stricto sensu* graduate programs in Nutrition in Brazil. Only four studies carried out in the country were identified [10-13], one of which reviewed the dissertations and theses produced in graduate programs in Nutrition, from 2003 to 2012, indicating the number of works produced per year; the type of approach to scientific knowledge; and the knowledge centers of the scientific field of Nutrition [11]. Three studies aimed to review specific research themes in Nutrition [10,12,13]. Lima et al. [10] analyzed the knowledge produced in nutritional education in postgraduate courses offered in Rio de Janeiro between 1980 and 1998. Henrique et al. [12] characterized the field of evaluation of public interventions in food and nutrition in postgraduate programs in Brazil between 1980 and 2004. Finally, Araújo and Almeida [13] outlined the profile of production on breastfeeding in *stricto sensu* postgraduate programs in nutrition in Brazil between 1974 and 2004. Therefore, the four studies identified used descriptive analyses in their methodological procedures.

Although there are few articles published on the analysis of dissertations and theses in Postgraduate Nutrition programs in Brazil over the last five years, this type of study has been frequently observed in different fields of scientific knowledge, such as Infectious Diseases and Tropical

Medicine, Nursing, Education, and Information Sciences [14-19]. Therefore, the relevance of this study is justified as it yields an overview of the scientific knowledge produced within the PPGN/UFSC since its foundation. Thus, this article aims to perform a descriptive analysis of the methodological characteristics of the dissertations and theses produced by the PPGN/UFSC, outlining the profile of the scientific contribution of this program to the area of Nutrition.

METHODS

A bibliometric analysis of the dissertations and theses produced at PPGN/UFSC was carried out. The search for PPGN/UFSC graduates covered the term until December 31, 2022, and was based on search in the UFSC Graduate Tracking System [20]; a nominal list in alphabetical order was obtained with information on the type of course and years of entry and completion.

The files of the final papers were retrieved from the institutional repository of theses and dissertations of UFSC [21] and stored in folders created by the researchers in Google Drive®.

To extract the data, an electronic spreadsheet was created in Microsoft Excel®, organizing the dissertations and theses according to the following characteristics: name of the graduated student, year of admission, year of course completion, line of research, name of the advisor, title of the final paper, type of approach, type of design, central theme(s), location of the study, population/subjects investigated according to age group, life cycle or other attributes.

Three trained investigators independently performed the data extraction procedures and completed the spreadsheet following a previously established protocol. In the data extraction process, the following procedures were performed: 1) Reading the titles; 2) Reading the abstracts; and 3) Reading the section/chapter on the methodological procedures of the investigation, when the two previous procedures were not sufficient to extract the information.

Regarding the lines of research, the dissertations and theses were grouped into the three respective lines of investigation of the PPGN-UFSC, namely: 1) Line I – called “Nutritional Diagnosis and Intervention in Collectivities”, equivalent to Nutrition in Public Health, which comprises: (a) epidemiological studies of the nutritional status in populations with different sociocultural and demographic characteristics at different stages of life, (b) epidemiological studies of risk factors and precursors of obesity and chronic diseases in adolescence and adulthood; and (c) evaluation studies of food and nutrition policies and programs; 2) Line II – entitled “Dietary and Biochemical Study related to nutritional status”, equivalent to Clinical Nutrition, which includes experimental and clinical studies, with healthy or sick individuals, involving: (a) the nutritional composition of regional and functional foods; (b) the metabolic effects of bioactive compounds, diets and/or foods; (c) the relationship between oxidative stress and inflammation and food intake; and (d) analysis of methods for assessing nutritional status; and 3) Line III – named “Nutrition in meal production and eating behavior”, equivalent to Collective Feeding, which includes studies of: (a) Nutrition in Meal Production considering the evaluation and proposal of quality systems (nutritional, sensory, hygienic-sanitary, regulatory, symbolic and sustainability) in commercial and collective production processes, serving diverse populations; (b) diagnosis of food consumption, diet quality, consumer perception and food safety; and (c) evaluation of food and nutrition policies and programs inherent to these themes [9].

Regarding the types of approaches to scientific knowledge, among the typologies observed in the literature on research methodology [22,23], it was decided to categorize the dissertations and theses into three modalities, namely: quantitative, qualitative or mixed (quantitative-qualitative).

As for the categorization of the dissertations and theses according to the research designs, following authors in the field of nutritional epidemiology [24], the works were initially grouped into two types of studies: Observational and Intervention. Subsequently, according to their methodological characteristics of data collection and analysis, they were categorized into the different typologies found in the literature: Cross-sectional, Clinical Trial, Cohort, Experimental (animal, food), Mixed Methods, Case Study, Content/Thematic Analysis, Methodological, Ethnography, Evaluative Research in Health, Documentary Study, Phenomenological, Literature Review, Case-Control and Grounded Theory.

The identification of the central theme was carried out based on the observation of the main terms/concepts present in the title of the work and/or in the description of the outcome and exposure variables.

A descriptive-exploratory analysis was carried out, and the results of the study are presented in this article in the form of absolute and relative frequency distribution tables. The graphical representation of the frequency of the theses and dissertations central themes was constructed using a word cloud. The size of the word was proportional to the number of dissertations and theses. The word clouds were generated using WordArt.com (California, USA).

RESULTS

General characterization of dissertations and theses produced by PPGN/UFSC

Over the 20 years of the PPGN/UFSC (March 2002 to December 2022), 323 final course works were produced (Table 1). Out of these, 274 (84.8%) were master's dissertations, an average of 14 dissertations per year. Regarding the doctorate, 49 (15.2%) theses were produced between 2015 and 2022, an average of six theses per year.

Regarding the distribution of the total number of dissertations and theses (n=323) across the three separate lines of research of the PPGN/UFSC, over the 20 years of the Program's existence, there was a predominance of works included in line of research II (47.1%, n=152), followed by line III (27.9%, n=90) and line I (25.1%, n=81) (data not shown in tables).

Table 1 shows that the master's degree course began with six dissertations presentations in 2003, peaking in 2014 (n=24); nine dissertations were from line I, twelve from line II and three from line III (Figure 1). The doctoral course, which initiated in 2012, had its first thesis presentation in 2015, peaking in 2018 (n=10); with two theses from line I, five from line II and three from line III (Figure 1).

Table 1 – Distribution of the total number of master's dissertations and doctoral theses approved by the Postgraduate Program in Nutrition at the Federal University of Santa Catarina, in the period 2003-2022. Florianópolis (Brazil), 2023.

Year	Master's degree		Doctorate degree	
	n	%	n	%
2003	6	2.2	-	-
2004	2	0.7	-	-
2005	5	1.8	-	-
2006	14	5.1	-	-
2007	22	8.0	-	-
2008	12	4.4	-	-
2009	7	2.6	-	-
2010	20	7.3	-	-

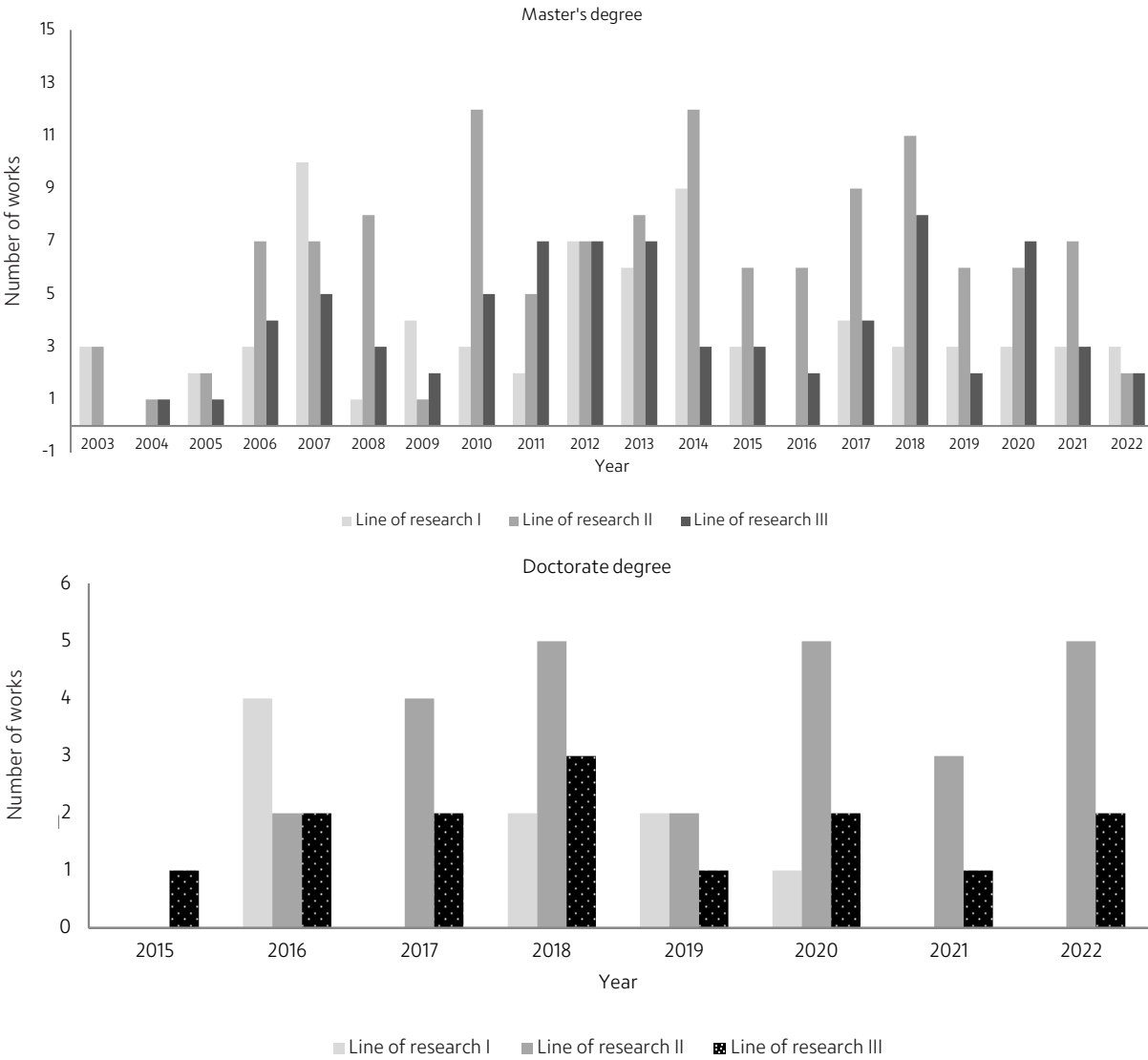
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Table 1 – Distribution of the total number of master's dissertations and doctoral theses approved by the Postgraduate Program in Nutrition at the Federal University of Santa Catarina, in the period 2003-2022. Florianópolis (Brazil), 2023.

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Year	Master's degree		Doctorate degree	
	n	%	n	%
2011	14	5.1	-	-
2012	21	7.7	-	-
2013	21	7.7	-	-
2014	24	8.8	-	-
2015	12	4.4	1	2.0
2016	8	2.9	8	16.3
2017	17	6.2	6	12.2
2018	22	8.0	10	20.4
2019	11	4.0	5	10.2
2020	16	5.8	8	16.3
2021	13	4.7	4	8.2
2022	7	2.6	7	14.3
Total	274	100.0	49	100.0

Figure 1 – Master's dissertations and doctoral theses approved by the Postgraduate Program in Nutrition of the Federal University of Santa Catarina, during the period 2004-2022, by year and lines of research. Florianópolis (Brazil), 2023.



Methods of dissertations and theses produced at PPGN/UFSC

In Table 2, the theses and dissertations are distributed according to the following characteristics: type of approach, research design, population and study location. Out of the 323 studies produced, 79.0% (n=255) presented a quantitative approach. Observational studies corresponded to 75.5% (n=244) of all studies, with 62.0% (n=151) characterized as cross-sectional studies. Regarding the study population, the studies were predominantly carried out with adults and/or elderly people (37.8%, n=122). Most of the studies were carried out in the city of Florianópolis or with the population of the Greater Florianópolis Metropolitan Region (78.0%, n=252). In addition, national (5.0%, n=16) and international (0.9%, n=3) studies were carried out.

Table 2 – Distribution of the total number of master's dissertations and doctoral theses approved by the Postgraduate Program in Nutrition of the Federal University of Santa Catarina during the period 2004–2022, according to general characteristics. Florianópolis (Brazil), 2023.

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Characteristics	Masters/Doctorate	
	n	%
Type of approach		
Quantitative	255	79.0
Qualitative	43	13.3
Mixed	25	7.7
Total	323	100.0
Research Design I		
Observational	244	75.5
Intervention	74	22.9
Observational + Intervention	5	1.6
Total	323	100.0
Research Design II		
Cross-sectional	151	46.7
Clinical trial	53	16.4
Cohort	31	9.6
Experimental (animal, food)	22	6.8
Mixed methods	21	6.5
Case study (single, multi-case...)	12	3.7
Content/thematic analysis	10	3.1
Methodological	8	2.5
Ethnography	4	1.2
Evaluative research in health	4	1.2
Documentary study	3	0.9
Phenomenological	1	0.3
Bibliographic review	1	0.3
Case-control	1	0.3
Grounded theory	1	0.3
Total	323	100.0
Study population		
Adults and older adults	122	37.8
Children and adolescents	83	25.7
Animal models/in vitro	20	6.2
Teenagers + adults / College students	16	5.0
Elderly	11	3.4
Teenagers + adults + elderly	2	1.2
Children + adults + elderly	2	0.6
Athletes	2	0.6
Pregnant/nursing women	1	0.3
Not applicable (NA)	64	19.8
Total	323	100.0

Table 2 – Distribution of the total number of master's dissertations and doctoral theses approved by the Postgraduate Program in Nutrition of the Federal University of Santa Catarina during the period 2004–2022, according to general characteristics. Florianópolis (Brazil), 2023.

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Characteristics	Masters/Doctorate	
	n	%
Study location		
Florianópolis	252	78.0
Santa Catarina	27	8.4
Brazil (National)	16	5.0
Southern Region (PR, RS)	13	4.0
Other region(s)	12	3.7
Other countries	3	0.9
Total	323	100.0

Note: NA: Studies with populations that do not include living beings.

Studies with a qualitative approach (n=43) were located in research lines I (Nutrition in Public Health) and III (Collective Feeding), with a predominance in line III (81.4%, n=35). Studies with a mixed approach (n=25) were identified in the three research lines, with line II (Clinical Nutrition) having the smallest number of studies (4.0%, n=1) (data not shown in tables).

Central theme of dissertations and theses produced by PPGN/UFSC

The central themes of study of the theses and dissertations are presented in Table 3. Thirty central themes were identified, the five most investigated being: obesity (11.8%, n=38); methods and assessment of food consumption (10.5%, n=34); functional foods and bioactive compounds (10.2%, n=33); food system, sustainability and food and nutritional security (FNS) (7.7%, n=25) and nutritional therapy (7.1%, n=23). However, in the last five years, new themes have been explored in the PPGN, such as Nutrition in neuroscience (2.8%, n=9), Nutrition in sports (1.2%, n=4) and meta-research in Nutrition (0.3%, n=1).

Table 3 – Central themes of dissertations and theses approved by the Postgraduate Program in Nutrition at the Federal University of Santa Catarina from 2004 to 2022. Florianópolis (Brazil), 2023.

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Central theme of study	Total	
	n	%
Obesity	38	11.8
Methods and assessment of food consumption	34	10.5
Functional foods and bioactive compounds	33	10.2
Food system, sustainability and FNS	25	7.7
Nutritional therapy	23	7.1
Labeling of packaged foods and restaurants menu	21	6.5
NCDs related to nutrition	17	5.3
Quality in meal production	16	5.0
Food choices and consumer behavior	14	4.3
Nutritional care in CKD on dialysis	12	3.7
Culinary skills and practices	11	3.4
Diet quality in breast cancer survivors	10	3.1
Assessment of body composition	9	2.8
Nutritional care in Cystic Fibrosis	7	2.2
Nutrition in Neuroscience	9	2.8
Food and nutrition of traditional peoples and communities	6	1.9

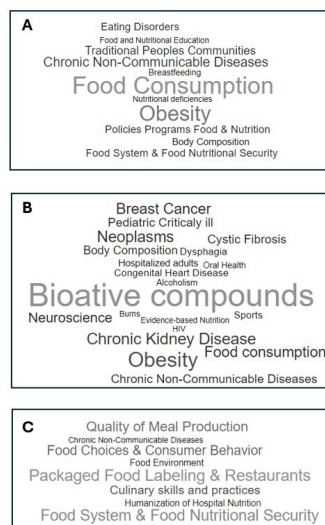
Table 3 – Central themes of dissertations and theses approved by the Postgraduate Program in Nutrition at the Federal University of Santa Catarina from 2004 to 2022. Florianópolis (Brazil), 2023.

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Central theme of study	Total	
	n	%
Food and Nutrition Policies and Programs	5	1.5
Eating disorders	5	1.5
Humanization in hospital nutrition	4	1.2
Nutrition in Sports	4	1.2
Prevention of atherosclerosis in congenital heart disease	4	1.2
Eating environment and practices of university students	3	0.9
Indicators of NS in hospitalized adults	3	0.9
Breastfeeding/complementary feeding	2	0.6
Nutrition and alcoholism	2	0.6
Nutrition and oral health	2	0.6
Iron deficiency anemia	1	0.3
Evaluation of NS in HIV	1	0.3
Food and nutritional education	1	0.3
Evidence-based nutrition	1	0.3
Total	323	100.0

Note: NCDs: Non-Communicable Diseases; CKD: Chronic Kidney Disease; FNS: Food and Nutritional Security; NS: Nutritional status; NT: Nutritional therapy; HIV: Human Immunodeficiency Virus.

Figure 2 shows the themes addressed in the different lines of research. In line I, the themes of obesity (n=20) and food consumption (n=18) stand out; in line II, functional foods and bioactive compounds (n=33) and obesity (n=18); and in line III, labeling of packaged foods and restaurants menu (n=21) as well as food system, sustainability and FNS (n=20).

Figure 2 – Word cloud generated from the central themes of PPGN dissertations and theses, by line of research, produced between 2002 and 2022. The size of the word is proportional to the number of dissertations and theses.

Note: (A) Research line I, (B) Research line II, (C) Research line III. Themes according to Table 3: Alcoholism: Nutrition and alcoholism; Bioactive compounds: Functional foods and bioactive compounds; Body composition: Assessment of body composition; Breast cancer: Diet quality in breast cancer survivors; Breastfeeding: Breastfeeding/complementary feeding; Chronic Kidney Disease: Nutritional care in CKD on dialysis; Chronic Non-Communicable Diseases: Chronic non-communicable diseases related to nutrition; Congenital heart disease: Prevention of atherosclerosis in congenital heart disease; Cystic fibrosis: Nutritional care in Cystic Fibrosis; Food consumption: Methods and assessment of food consumption; Food environment: Eating environment and practices of university students; Food system & Food and Nutritional Security: Food system, sustainability and food and nutritional security; HIV: Evaluation of nutritional status in HIV; Hospitalized adults: Indicators of nutritional status in hospitalized adults; Neuroscience: Nutrition in neuroscience; Nutritional deficiencies: Iron deficiency anemia; Nutritional therapy: Pediatric Critically ill, Burns, Dysphagia and Neoplasms; Oral health: Nutrition and oral health; Packaged Food Labeling & Restaurants: Labeling of packaged foods and restaurants menu; Policies Programs Food & Nutrition: Food and Nutrition Policies and Programs; Sports: Nutrition in sports; Traditional Peoples Communities: Food and nutrition of traditional people and communities.

Basic training (undergraduate) for graduates of the Postgraduate Program in Nutrition

Of the 274 master's graduates from the PPGN, 244 (89.1%) had graduated in Nutrition, 11 (4.0%) had graduated in Nutrition and another course (Social Work, Physical Education, International Relations, Gastronomy, Mathematics, Administration, Law, Tourism and Hospitality, Data Processing and Food Technology), and 19 (6.9%) in another course (Physiotherapy, Anthropology, Psychology, Physical Education, Nursing, Dentistry, Pharmacy, Speech Therapy, Tourism, Food Technology and Gastronomy) – Data not shown in tables. In the Doctorate, of the total number of graduates (n=49), 46 (93.9%) had degrees in Nutrition, two (4.1%) in Nutrition and another course (Physical Education and Mathematics) and one (2.0%) had degrees only in another course (Speech Therapy) – Data not shown in tables.

DISCUSSION

Over the course of its 20 years of operation, the PPGN/UFSC has produced 274 master's dissertations and 49 doctoral theses. This set of 323 studies performed was characterized by presenting, mostly, research with a quantitative approach; observational type; with a cross-sectional design; investigating populations of adults and/or elderly and children and/or adolescents; located in Florianópolis; with an emphasis on line of research II – Dietary and biochemical studies related to nutritional status. In addition, a range of 30 central themes investigated in the dissertations and theses were identified, the three most frequent being: obesity, methods and evaluation of food consumption, and functional foods and bioactive compounds.

These results, as already indicated in previous studies [11,25], suggest the continued hegemony of quantitative (positivist) approaches in relation to the use of qualitative and/or mixed methods in the research produced in PPGN/UFSC. Although Nutrition can be characterized as a multidisciplinary science [26-28], the results found seem to reflect the influence that philosophical paradigms linked to positivism and biological sciences exert on the majority of researchers in the Program. It is worth noting that this predominance of quantitative paradigms use (those centered on biological sciences, mathematics, statistics and computing), to the detriment of qualitative and/or mixed paradigms (those with greater emphasis on human and social sciences), is not exclusive to the scientific field of Nutrition, having been observed in other scientific fields linked to life sciences and other areas of knowledge, such as Physical Education [29], Nursing [30,31], Speech Therapy [32,33], Physiotherapy [34,35], Medicine [36,37], Dentistry [38,39] and Information Science [19].

In a previous study, Vasconcelos [11,25], when analyzing a set of 962 dissertations and theses defended in seven Brazilian postgraduate programs in Nutrition, observed the hegemony of the quantitative approach, since this type of research was adopted by 92.5% (n=890) of the total number of investigators, while the qualitative and mixed approaches had "marginal" participation, being adopted by only 5.4% (n=52) and 1.9% (n=18), of the total number of investigators. In the specific case of PPGN/UFSC, a previous study by Vasconcelos [11, 25] identified that, of the total of 121 dissertations presented between 2003 and 2012, 86.0% (n=104), 11.6% (n=14) and 2.4% (n=3) had quantitative, qualitative and mixed approaches, respectively.

Therefore, in the last ten years (2012-2022), there was a slight increase (7%) in studies using qualitative (n=17) and mixed (n=11) approaches in the PPGN/UFSC. Even so, the quantitative approach remains predominant, a fact that can be attributed, in part, to the specific characteristics of the Program's three lines of research, which were described in the methods section of this article [9].

Lines I (equivalent to Nutrition in Public Health) and III (equivalent to Collective Feeding) of the PPGN are made up of three major categories of studies each. In line III, qualitative studies are carried out within the three thematic modalities. However, in line I, only one of the categories encompasses qualitative research, as the others are epidemiological. In turn, it is observed that in the description of the four categories of studies that make up line II (equivalent to Clinical Nutrition), all direct the carrying out of predominantly quantitative research [9].

At the same time, the results of this study can be associated with the historical characteristics of the formation of the field of Nutrition and its distinct subfields of knowledge [26-28]. Therefore, it is necessary to recognize that the three lines of research of the PPGN/UFSC are composed of researchers with academic training at the undergraduate and postgraduate levels (master's and doctorate), focused almost exclusively on the field of Health Sciences (and particularly Nutrition) [9]. Consequently, this epistemological bias of academic training contributes and directs to an academic production predominantly associated with the medical-biological and quantitative paradigms. In the analysis of the dissertations and theses of the PPGN/UFSC, it was observed that the academic products linked to qualitative and mixed approaches are concentrated in research lines III (Collective Feeding) and II (Nutrition in Public Health), in which investigators with academic training (at master's and doctoral levels) closer to the field of Human and Social Sciences are allocated, thus, with greater identification with scientific paradigms of a qualitative or subjective nature [9,11,25].

Other factors related to the structuring and composition characteristics of the PPGN/UFSC research lines can be added to the list of possible explanations for the results obtained. Throughout the 20-year trajectory of the Program, research line II has concentrated the largest number of professors (currently nine), followed by line III (currently eight) and, lastly, line I (currently five) [9]. As a consequence of this numerical composition, the offer of vacancies and annual defenses among the three research lines differs [20,21,40]. In this sense, the hegemony of research line I and the quantitative approaches observed in this study is justified. We emphasize, however, that these variables (number of professors and annual vacancies per research line) were not included in our analysis, which represents an important methodological limitation.

In light of other observational studies already recorded in the literature, a trend similar to our results was observed. For example, in the field of Nursing, a study carried out by Rocha and Silva [31], reviewing 285 abstracts of dissertations and theses produced in Brazil, found that there was a strong influence of positivist approaches (centered on quantitative methodological procedures for data collection and analysis), although they observed the emergence of alternative approaches, seeking theoretical foundations in dialectics and phenomenology.

A more recent study conducted by Pimenta et al. [15], analyzing 162 dissertations and 26 theses presented in the Postgraduate Program in Nursing at the Universidade Federal da Paraíba (UFPB, Federal University of Paraíba), found that, in relation to the methodological approach, 46.3% (n=87), 30.3% (n=57) and 11.2% (n=21) of the studies used qualitative, quantitative-qualitative and quantitative methodological procedures, respectively. Therefore, these findings are quite different from our results. On the other hand, the study by Pimenta et al. [15] is similar to ours in identifying that 79.3% of the graduates had a degree in Nursing; that 26.1% investigated adult/elderly populations; and that 35.1% (n=66), 31.9% (n=60), 13.8% (n=26) and 12.8% (n=24), respectively, were descriptive, exploratory, cross-sectional and methodological studies.

In the field of Physical Education, Rosa and Leta [29], when analyzing the academic production of 11 PPGs in this area of scientific knowledge (n=5,628 titles), identified a predominance of studies with a biological approach, centered on physiology (53.2%), although they observed epistemological

heterogeneity in these investigations. On the other hand, in a more recent study, Farias et al. [41], when reviewing 131 dissertations and 16 theses produced in PPGs of Physical Education and Education in Brazil, which dealt with the theme of Physical Education in early childhood education, identified that 124 (84%) represented qualitative approaches, 19 (13%) quantitative and four (3%) qualitative-quantitative.

In the field of Dentistry, a study carried out by Amorim et al. [39], when reviewing 284 master's dissertations and 50 doctoral theses defended in the Postgraduate Program in Dentistry at the Universidade Luterana do Brasil (ULBRA, Lutheran University of Brazil), showed an exclusive production profile of quantitative approaches, distributed as follows: 146 (43.7%) studies with *in vitro* experimental design, 78 (23.4%) cross-sectional, 37 (11.1%) with experimental animal models, 19 (5.7%) randomized clinical trials, 14 (4.2%) quasi-experimental studies and the remaining 40 (11.9%) were reported as systematic reviews. On the other hand, the study developed by Casotti et al. [42], on the production of knowledge in the area of Education (training) in Dentistry, when reviewing 37 dissertations and 20 theses defended in different PPGs in the country, in the period 1995-2006, they identified a predominance of qualitative approaches ($n=28$ / 49.1%), reduced frequencies of quantitative approaches ($n=3$ / 5.3%) and mixed approaches ($n=3$ / 5.3%).

In the field of Medicine, Kritski et al. [37], when reviewing the Brazilian scientific production on the subject of tuberculosis over two decades, observed that only 5.9% ($n=22$) of the 372 dissertations and 8.0% ($n=11$) of the 137 theses reviewed used qualitative or mixed approaches. Therefore, this is a field of knowledge with a predominance of quantitative studies ($n=476$ or 93.5%). On the other hand, when specific themes were investigated, such as "palliative care in Pediatric Oncology", a predominance of qualitative approaches was observed, as in the study carried out by Dias et al. [43]. These authors reviewed 60 studies (47 dissertations and 13 theses) carried out in 18 Brazilian PPGs, from 2008 to 2018; they identified 49 investigations with qualitative approaches (82.0%), seven (12.0%) quantitative and four (6.0%) mixed investigations [43].

In other fields of knowledge, a predominance of quantitative approaches was sometimes observed and other times qualitative or mixed approaches, depending on the epistemological, ontological or philosophical nature of the field and/or the specific theme investigated. For example, Seabra Filho and Fell [19], reviewed 64 dissertations presented in the Postgraduate Program in Information Science at the Federal University of Pernambuco, and identified a predominance of studies with quantitative/objective approaches ($n=56$ or 87.5%), which were categorized as belonging to the positivist paradigm, while the remaining studies ($n=8$ or 12.5%), which presented qualitative or mixed approaches, were linked to the constructivist, post-positivist and critical theory paradigms, according to the categorization proposed by Guba and Lincoln [44]. On the other hand, studies carried out in the field of Education, in the last five years, have highlighted the hegemony and/or exclusivity of qualitative approaches, such as the investigations carried out by Silva et al. [45], Alves [46] and Novaes et al. [47].

In summary, the dialogue we seek to establish with the literature points to the historical maintenance of the hegemony of research based on quantitative approaches, centered on positivist philosophical and epistemological assumptions, and which advocate the overvaluation of the use of biomedical and epidemiological models as central paradigms of studies [11,25]. Qualitative approaches, based on subjectivist paradigms, whose emergence and notoriety occurred from the 1990s onwards in the field of Public Health [48], still represent a very incipient portion of the set of research in the field of Nutrition [11,25]. We deduce that the factors that favor the maintenance of the methodological characteristics of the dissertations and theses of the PPGN/UFSC are multiple

and complex. Given the multiplicity of factors involved, we could highlight: 1) The organizational model of the National Postgraduate System (SNPG), established under the responsibility of the Coordination for the Improvement of Higher Education Personnel, which defines the process of creating, evaluating and monitoring *stricto sensu* postgraduate courses in this country. A model consisting of quantitative evaluation criteria, centered on productivity indexes, bibliographic citation, visibility and international circulation of knowledge produced by postgraduate programs [49,50]; 2) The role of public and private research funding agencies, which have given priority and encouraged in their notices criteria that favor the selection of research projects with quantitative and positivist approaches [51,52]; and 3) The specific characteristics of the composition of the teaching staff and the research lines of the Program, mentioned previously [11,25].

Still on the subject of the hegemony of quantitative approaches in the field of Health Sciences, it is worth mentioning the reflection made by Bosi [53] on the challenges of training qualitative researchers in health, under the productivist regime of Brazilian postgraduate studies. Although the author makes an analysis based on the field of Public Health, her reflections can also be directed to the field of Nutrition, given the biomedical and interdisciplinary nature of both scientific fields. In an evaluation system that uses as metrics the number of publications and the impact factor of journals in which the papers are published, Bosi [53, p.35] argues that those “who publish qualitative research in health, in addition to constituting a minority in the rankings that define the evaluations, do not respond to the parameters dictated by the worldview of the dominant science”. Bosi [53] also reflects on the unequal access of Brazilian researchers to international journals based in central countries, and also mentions the refusal of qualitative studies by journals, with the justification “of lack of relevance to the scope of the journal (and its context) and, more frequently, of little applicability beyond its context of origin” (p.35). Finally, in Bosi’s view [53], taking the Brazilian scenario as a reference, the direction of scientific funding is defined by productivity grant holders, which can impact the allocation of resources to qualitative research, depending on the composition of the evaluation board.

Regarding the population investigated (the study subjects) in the PPGN/UFSC dissertations and theses over the period 2002-2022, a higher frequency of studies focused on nutritional issues in adults and the elderly was observed. Subsequently, investigations with children and adolescents appeared, particularly on aspects of the complex and multidimensional causal network of obesity, involving prevalence, associated factors, consequences, and prevention and treatment strategies. Although focused on these two large age groups, the central themes investigated covered nutritional issues involved in the different phases of the human life cycle: pregnancy, breastfeeding, growth and development, sexual maturation, reproduction, aging, and death. Due to the lack of similar studies in the field of Postgraduate Studies in Nutrition, the discussion of these findings becomes a limiting factor of the study. Our results maintain some similarity with the analysis carried out by Pimenta et al. [15], who also identified a greater concentration of dissertations and theses in the field of Nursing focused on investigations with adults and the elderly. Therefore, we endorse the explanatory hypothesis stated by Pimenta et al. [15], that the emphasis on studying aspects related to the nutrition of adults and the elderly may be associated with the processes of demographic, epidemiological, food and nutritional transition that Brazil and the world have experienced in recent decades [54-56]. These processes have triggered an increase in life expectancy, population aging and the need for more nutritional care for these age groups, mainly due to the increase in the prevalence of chronic non-communicable diseases [57,58], which justifies the relevance, opportunity and pertinence of research that produces new knowledge on the topic of nutrition and population aging.

It is worth noting that the predominance of original studies conducted with the population of the city where UFSC is headquartered (Florianópolis/SC) constitutes evidence that reinforces the local vocation of the Program. However, it is considered that the data generated by the dissertations and theses of the PPGN/UFSC have a social impact that goes beyond the local sphere, extending to the state, the country, and even the international scenario, in relation to certain themes investigated. In this sense, contributions from epidemiological studies to local, regional, and national public health stand out [59-61]; studies that analyze legislation [62,63] and foods in national circulation [64,65], which contribute to the formulation of state and federal public policies; as well as population-based [66] and local studies [67-69], whose potential impact on clinical care and public policies extends globally. In addition, methodological development studies [70-72]; and systematic review studies, carried out in all lines of the PPGN [73-76], impact the global scientific sphere.

Regarding the central themes addressed in the dissertations and theses of the PPGN/UFSC, it is worth highlighting that the most investigated one – obesity, constitutes a transversal theme between line I (being the most studied) and line II (second most studied in the line). Also noteworthy are the themes of food consumption (line I); functional foods and bioactive compounds (most studied in line II); and in line III, labeling of packaged foods and restaurants menu as well as food system sustainability and FNS. All these themes are among those pointed out as trends in Nutrition science by Mozaffarian et al. [27] and/or Bassaganya-Riera et al. [77], such as: functional foods and bioactive compounds; prebiotics, probiotics and intestinal microbiota; sustainability of the food system, including food processing and labeling; and interfaces related to chronic non-communicable diseases, especially obesity [27,77]. In the context of chronic non-communicable diseases, Mozaffarian et al. [27] also mention the importance of studies on social and health inequalities, public policies on nutrition, food environment, school meals, and nutritional education – which include food and nutritional education and culinary skills, topics also frequently addressed in the PPGN-UFSC.

In turn, the trends for Nutrition science for the period 2020-2025, raised by Bassaganya-Riera et al. [77], also include research themes identified as emerging in the PPGN-UFSC, such as nutrigenomics, Nutrition in neuroscience and in sports/performance. In addition, the growth of the theme of evidence-based Nutrition in the Program's research stands out, initially inserted as a method within the three lines of research and, more recently, as a theme of line II, in the context of meta-research.

Over the 20 years investigated, a plurality was observed in the basic training of PPGN/UFSC graduates, as shown in the results data. Although the majority of the training corresponds to a bachelor's degree in Nutrition, there are graduates with training in Physiotherapy, Anthropology, Psychology, Physical Education, Nursing, Dentistry, Pharmacy, Speech Therapy, Tourism, Food Science and Technology, and Gastronomy. This can be justified by the interdisciplinarity of this field of scientific knowledge, which is defined by the CAPES Assessment Area [78, p.5] as “a field of knowledge in which different themes and theoretical-methodological approaches are articulated to promote scientific advancement and the training of qualified human resources”, and encompasses five core areas of knowledge composed of: Food and Public Nutrition; Human and Social Sciences in Food and Nutrition; Epidemiology and Food and Nutrition Policies; Basic and Experimental Nutrition; and Clinical Nutrition.

To our knowledge, our study is the first study outlining the training and production of a Postgraduate Program in the area of Nutrition that reviewed all of the studies produced throughout the history of the program. However, due to the volume of studies and the diverse characteristics of the types of studies, populations, locations, and themes developed, a possible limitation is the

loss of specificity of the data due to the need to combine categories in the tabulation procedures. Thus, some data cannot be identified accurately, such as the frequency of studies with only the elderly, or studies conducted in Florianópolis but with foods produced or sold throughout Brazil. It is also worth noting that in the methodological procedures used to identify the study designs, the typology described by the author of the dissertation or thesis was considered; therefore, depending on the bibliographic or methodological reference used to support the classification, some study typologies may vary. Furthermore, the choice to classify the study design considering the general objective of the dissertation or of the thesis makes it impossible to identify some works in which literature review studies were also conducted, frequently carried out as a specific objective of the studies carried out at PPGN-UFSC, especially theses.

Finally, the definition of the study objective to perform a descriptive analysis of the methodological characteristics (year of production, line of research, type of approach, type of design, central theme, location of the study, population/subjects investigated according to age group, life cycle or other attributes) of the dissertations and theses produced in the PPGN/UFSC over 20 years, caused, in itself, an important methodological limitation of the research. The analysis performed allows a descriptive-exploratory profile of these methodological characteristics; however, more robust analyses, including information not collected (such as number of vacancies available and number of professors per line of research) and association between the variables analyzed (such as evolution of the themes over the years; impact of the creation of the doctorate degree on the volume, quality and diversification of scientific production, etc.) ought to be performed in further studies.

CONCLUSION

Throughout its twenty-year history, the PPGN-UFSC has contributed to the training of predominantly nutritionists, although it has managed to encompass a group of other professionals, who developed their dissertations and theses mainly in the research lines of “Dietary and Biochemical Study related to nutritional status” (Clinical Nutrition) and “Nutrition in Meal Production and Eating Behavior” (Collective Feeding). It was observed that observational quantitative studies predominated, with the adult and elderly population, especially at the local level.

In turn, the most studied themes involved not only obesity - the main focus - and other chronic non-communicable diseases that affect the population, but also issues related to diets, dietary study methods and foods, studies on functional foods and bioactive compounds. Also noteworthy are the themes that analyze food from its production, distribution, access and consumption by the population, taking into account the principles of sustainability and the food system, food and nutritional sovereignty and security. Finally, there was a trend towards an increase in studies in new thematic areas of the complex and multidisciplinary science of Nutrition, such as neuroscience, physical activity and meta-research.

Thus, the Program’s vocation for developing quantitative studies with humans and food was highlighted, with different themes of interest to Nutrition science at local, national and global levels. Follow-up studies of the PPGN-UFSC are suggested, to verify the maintenance of its profile or the transition of designs, population and study themes, as well as the training of human resources. Studies are also suggested with other Nutrition PPGs in Brazil, which may contribute to the advancement of this field of knowledge in Brazilian postgraduate studies.

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