

Scientific production of Nutrition courses in Food and Nutrition in Collective Health: contributions to the debate on professional performance

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ABSTRACT. This study aims to analyze the scientific production of Nutrition courses on knowledge core Food and Nutrition in Collective Health (FNCH) and its associations with institutional characteristics and advisor's academic degree. A bibliometric study was performed on 195 final projects of five nutrition courses in *Rio Grande do Norte* state (Brazil) from the year 2013. Information related to higher education institutions and academic degree of advisor were collected. From the reading of sections of final projects, screening was performed on final project involvement with knowledge core FNCH, being collected general methodological characteristics, classification on sub cores of FNCH, and theme approached. Pearson's chi-square test was used with a significance level at $p\text{-value} \leq 0.05$ and 95% confidence interval in a univariate and bivariate way. From the total of analyzed final projects, 54 (27.7%) were related to knowledge core FNCH, prevailing final projects with a quantitative approach (61%), presented as scientific articles (57%), and performed in public services (45%). There was an emphasis on the sub-core of Nutritional Epidemiology (63%) [$p < 0.001$], with the theme Nutritional Assessment (57%) [$p < 0.001$]. There was no significant association between FNCH final projects proportion and institutional characteristics or advisor's academic degree. Thinking about nutritionists' practice, limitations were identified on FNCH scientific production, with an emphasis on nutritional diagnosis researches, with less involvement in public health policies and human and social sciences.

Keywords: nutritionist; public health; research; staff development.

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Introduction

Collective Health in Brazil starts in the late 70s, based on the preventive and social medicine in a social context of struggles for the re-democratization of Brazil and Brazilian health reform (Osmo & Schraiber, 2015). Despite its multiplicity of definitions, most scholars define it as a scientific and interdisciplinary area of knowledge and practices aimed to rescue the social in health, based on the interface between Natural Sciences and Human and Social Sciences with a different epistemological nature and political practice (Bosi & Prado, 2011; Osmo & Schraiber, 2015).

It is also characterized as a movement. In Brazil, Collective Health contributed decisively to the construction of Unified Health System (SUS, per its acronym in Portuguese) and to enrich the understanding of the determinants of the health and disease process (Campos, 2000). As a multidisciplinary area, its teaching has been carried out in different undergraduate courses in the health area (Bosi & Paim, 2010), including the Nutrition course.

In nutrition as a professionalization area, Bosi and Prado (2011) highlighted three main centers of most recognized practices: Clinical Nutrition, Food Service, and Nutrition in Collective Health. The latter has its foundation in dietetics and aggregates in different proportions the constituent cores of Collective Health, which was considered by the authors as the scope of Food and Nutrition in Collective Health (FNCH). While recognized as a nutritionist's area of expertise, this core of knowledge provides food and nutrition activities within the scope of institutional policies and programs, in primary care and health surveillance (Brasil, 2018). It is important to mention that just like Collective Health itself (Osmo & Schraiber, 2015), FNCH also receives other denominations, such as Nutrition in Collective Health, Nutrition in Public Health, or Social Nutrition, and for this text, we adopted the term FNCH.

We need to clarify the understandings of the scientific area and the core of knowledge adopted for this study, which followed the perspectives of Bourdieu (1983) and Nunes (2013), respectively. The scientific area is a space of competitive struggle over the monopoly of scientific competence, understood as the ability to speak and act legitimately that is socially granted to a determined agent. The core of knowledge is the possibility of specialization within an area, presupposing an understanding of the existence of disciplinary nuclei that present sets of knowledge built throughout the history of science.

In this perspective, within the scientific area of Nutrition, there are diverse cores of knowledge, such as FNCH.

An emphasis on this core is presented by the National Curriculum Guidelines (DCN, per its acronym in Portuguese) about the training of nutritionists, which advocate professional training geared to the health needs of the population with an emphasis on the SUS, recognizing health as a right and acting to ensure the integrality of the assistance (Brasil, 2001; Soares & Aguiar, 2010). Despite this, studies focused on the specific training of nutritionists in Collective Health are scarce (Medeiros, Prado, & Bosi, 2014; Neves, Sousa, & Vasconcelos, 2014).

Also, in the DCN (Brasil, 2001), they present the obligation to research under professor supervision as a requirement to complete the Nutrition course. Regarding undergraduate scientific initiation, Pinho (2017) pointed out that the students who do it show better capacity for critical analysis, maturity, and intellectual autonomy and greater discernment to face their difficulties, which extends to the student's professional life.

With this scenario, this study aims to analyze the mandatory scientific production of Nutrition courses in the core of Food and Nutrition in Collective Health (FNCH) and its associations with institutional characteristics and teacher qualifications. This approach is justified by understanding scientific research as an active methodology, constituting one of the dimensions of training capable of bringing students closer to social realities and problems, providing data collection and analysis, and proposing interventions and solutions to problems of social reality. In this sense, the intended analysis is directed to research in undergraduate courses as a path to contribute to the professional performance in Collective Health.

Methods

This is a bibliometric study whose unit of analysis consisted of Final Projects (FP) of undergraduate courses in Nutrition in Rio Grande do Norte (RN), Brazil. The FPs were chosen as a unit of analysis because they constitute the mandatory scientific production of Nutrition courses throughout Brazil, as determined by the DCN (Brasil, 2001). Bibliometrics constitutes a measurement process related to the book or document aimed to identify literature behaviors and their evolution in a specific context and time, looking for a profile of the knowledge records (Bufrem & Prates, 2005).

The study included undergraduate courses in Nutrition of RN with classes graduated until 2013, with a total of 5 courses affiliated to 3 Higher Education Institutions (HEIs), 1 public and 2 privates. From these courses, all the FPs presented in 2013 were included for 4 courses, and for 1 course the FPs presented in 2014 were included, up to the first semester of 2014. This methodological adjustment was necessary because this last course had a curricular structure and, due to this event, there was no conclusion of classes in 2013. As this course has only one annual entry, the FPs presented in the first semester of 2014 corresponded to the total of FPs in 2014.

Considering the cut-off point adopted for the completed classes, 195 FPs were preliminarily recruited for this study, in which 171 were presented in 2013 and 24 in the first semester of 2014.

Data collection and analysis took place between June 2014 and February 2015, with a review in May 2019.

We accessed the FPs through contact with the coordinators of courses and libraries presenting a letter of presentation of the study and a term of responsibility. We copied the works available as a computer file, while those available in the printed version had the sections of interest photographed and the images loaded on a virtual disk.

The 195 recruited FPs were pre-analyzed by reading the covers, abstracts and keywords, objectives, and methodology of the work to identify the core of knowledge of interest to the FPs. The criterion of this identification was the definition of the areas of activity of the nutritionist proposed by the Federal Council of Nutritionists (FCN) (Brasil, 2005), legislation in force at the time of data collection and analysis. After this preliminary analysis, there were 54 FPs dedicated to the core of knowledge of interest to FNCH.

From reading the cited sections of the works dedicated to the FNCH area, the following variables were collected: title of the work, number of authors, the format of the work, the title of the advisor professor, study

approach, scenario of performance, submission to the committee of ethics, sub-core of knowledge of FNCH and the theme addressed.

We carried out the classification among the sub-core of knowledge of the FNCH as defined by Bosi and Prado (2011). We determined the theme addressed according to an adaptation of the subjects of the core knowledge of Collective Health for the Nutrition courses presented in the study by Recine et al. (2012). We needed to insert the theme “Health Surveillance” present in the scope of the nutritionist's performance in Collective Health (Brasil, 2005), but not found in the study by Recine et al. (2012).

For all works (195), we collected the variables related to the administrative category (public or private) and academic organization (university center or university) of the HEIs through consultation with the e-MEC system (Sistema e-MEC, 2015), and the degree of supervising professors (specialist, master or doctor).

Thus, Figure 1 shows a summary of the study's analysis flowchart.

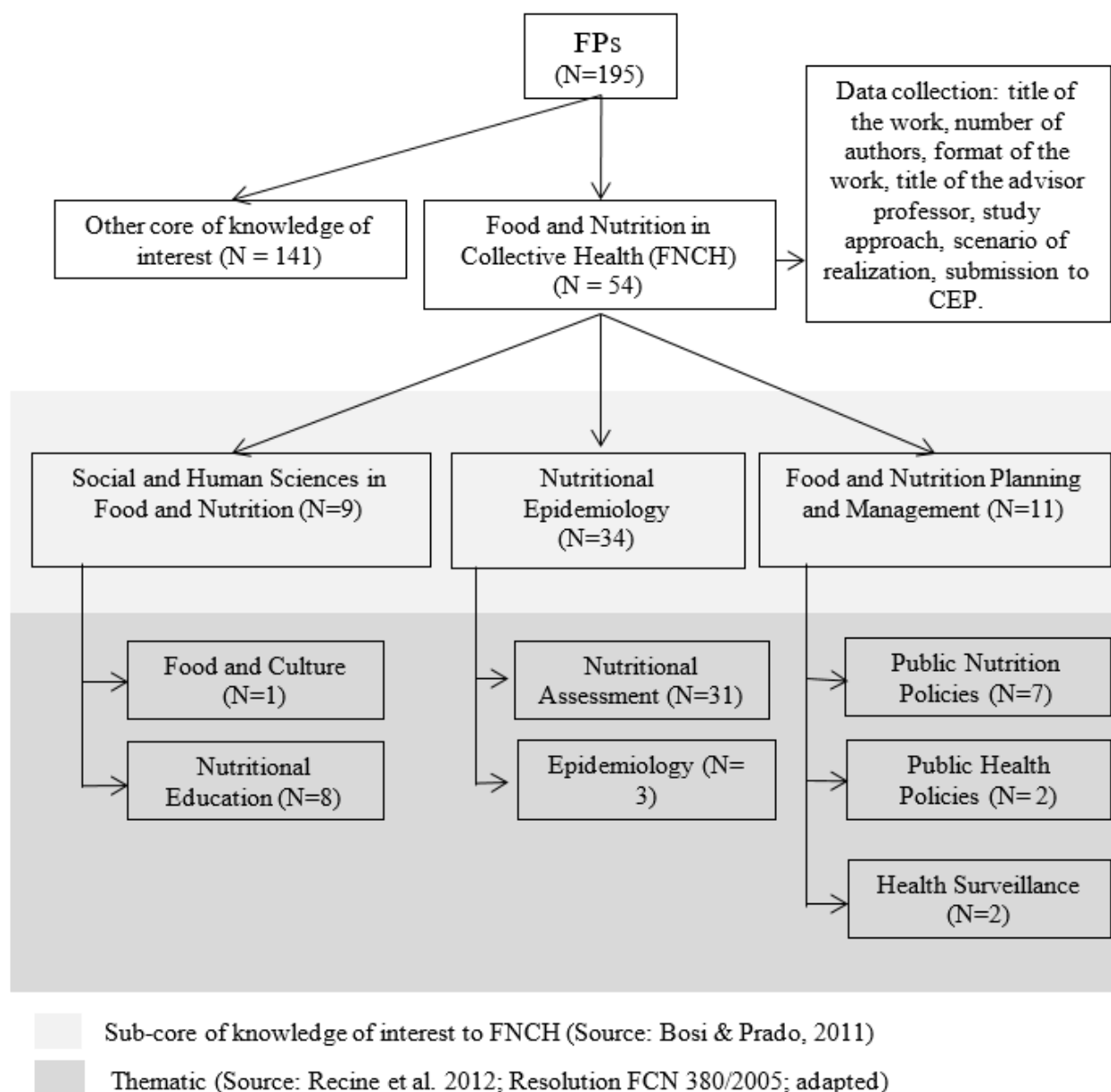


Figure 1. Flowchart of analysis of Final Projects for Undergraduate Nutrition courses in Rio Grande do Norte 2013/2014. FP: Final Project. Source: Own elaboration.

Data tabulation was done in the Microsoft Excel 2010® spreadsheet. The database was exported to the SPSS Statistical Program version 20 for statistical analysis.

First, we carried out a descriptive analysis of the variables using frequencies. To detect categories with significant emphasis on the variables sub-core of knowledge of interest to FNCH and thematic, Pearson's chi-

square non-parametric test was performed in a univariate way. A bivariate analysis was carried out between the variable core of knowledge of interest and variables related to HEIs and the training of guiding professors. For all analyzes, the significance level was set at $p \leq 0.05$ and a 95% confidence interval.

Due to the nature of the research object, whose unit of analysis constitutes a FP presented in a public section and deposited in its libraries or files according to each course, it was not necessary to assess the research project by the Research Ethics Committee (CEP). However, we decided to formalize the request for access to the FPs to safeguard the entry of the responsible researcher in the physical space of the HEIs. Also, we kept strictly confidential data that could identify the authors and advisors of FP.

Results

We recruited 195 papers, in which 54 (27.7%) were analyzed for being about the core of knowledge of FNCH. Table 1 shows the general characteristics of the analyzed works ($n = 54$), which present a predominance of FPs in the format of scientific articles, with a quantitative approach and with public services as the locus of development.

Table 2 shows the distribution of the studies analyzed according to FNCH sub-cores and themes. The Nutritional Epidemiology sub-core stood out significantly ($p < 0.001$), with a frequency of 63.0%. Regarding the themes of the papers, there was a significant highlight for Nutritional Assessment (57.4%) ($p < 0.001$).

Association was absent between the proportion of papers dedicated to the FNCH core of knowledge and the administrative category ($p = 0.078$) and academic organization ($p = 0.889$) of the HEIs, as well as with the degree of professors ($p = 0.170$) (Table 3).

Table 1. General characteristics of the Final Projects dedicated to the core knowledge of Food and Nutrition in Collective Health of the Nutrition courses in Rio Grande do Norte, Brazil - 2013/2014 ($N = 54$).

Variables	N	%
Format		
Article	31	57
Monography	23	43
Quantity of authors		
1 student	40	74
2 students	14	26
Degree of the supervising professor		
Specialist	5	9
Master	36	67
Doctor	13	24
Study approach		
Quantitative	33	61
Qualitative	9	17
Literature review and documentary research	12	22
Scenario		
Public literature and documents	13	24
Laboratory	2	4
Public service	24	45
Private service	11	20
Others	4	7
Submission to the Research Ethics Committee		
Yes	33	61
No	3	6
Not applicable	18	33

Source: Own elaboration.

Discussion

Through this study, we could approach the characteristics of scientific production in FNCH of Nutrition courses, an aspect that has not yet been explored in the literature. Professional training as a research topic needs to be valued (Recine & Mortoza, 2013), and within this perspective, training for Collective Health is a priority (Medeiros et al., 2014).

The results related to the general characteristics of the FPs dedicated to FNCH reveal similarities and divergences when compared to the general analysis of all papers ($N = 195$), previously published (Menêzes, Borges, Santos, & Noro, 2016). The most relevant similarities concern the predominance of articles, the guidance provided by master professors, and the quantitative approach. The main divergence refers to the study site, which in the

papers as a whole predominated the laboratory and, in this study, public services were highlighted (Menêzes et al., 2016). The research in the scope of public services provides HEIs with a perspective of returning to society about the investment received, still very beneficial to the student in training.

Table 2. Sub-core of Food and Nutrition in Collective Health (FNCH) and thematic in Finals Projects of Nutrition courses in Rio Grande do Norte, Brazil - 2013/2014 (N = 54).

Variables	N	%	p
Sub-Core of Food and Nutrition in Collective Health			
Nutritional Epidemiology	34	63.0	< 0.001*
Food and Nutrition Planning and Management	11	20.3	
Social and Human Sciences in Food and Nutrition	9	16.7	
Thematics			
Nutritional Assessment	31	57.4	< 0.001*
Epidemiology	3	5.6	
Public Health Policies	2	3.7	
Public Nutrition Policies	7	13.0	
Health Surveillance	2	3.7	
Nutritional Education	8	14.8	
Food and Culture	1	1.9	

*Univariate analysis - Pearson's Chi-square test; Source: Own elaboration.

Table 3. Association between the frequency of Final Projects dedicated to Food and Nutrition in Collective Health (FNCH) and institutional characteristics and degree of supervisors, Rio Grande do Norte, Brazil - 2013/2014 (N = 195).

Variables	Core of knowledge of FNCH		Other core of knowledge		p
	N	%	N	%	
Administrative category					
Public	29	34,1	56	65.9	0.078*
Private	25	22,7	85	77.3	
Academic Organization					
University	43	27,9	111	72.1	0.889*
University center	11	26,8	30	73.2	
Degree of the advisor **					
Doctor	13	21,3	48	78.7	0.170*
Master or specialist	41	30,8	92	69.2	

*Pearson's Chi-square test; ** Valid count = 194; Source: Own elaboration.

A bibliometric study performed on FPs of the dentistry course at the Federal University of Santa Catarina presented in the period from 2011 to 2016 found that 'public services' was the most prevalent scenario (44.22%). Despite this, papers dedicated to Collective Oral Health accounted for only 13.08% of the research areas worked (Vieira, Geraldi, Gomes, Castro, & Finkler, 2018). Given this finding, the authors stressed the importance of building research projects based on the DCN (Vieira et al., 2018), an aspect investigated in this study.

Thinking about the result found for the distribution of the FNCH sub-core of the FPs, it is interesting to analyze the course of the history of these cores of knowledge in Brazil, as paradigms or historical conceptions that guided the performance of scientists in different historical periods. Through this analysis, between the birth of the area and 1963 was highlighted the search for the eugenic value of food versus the thesis of 'hunger sickness and not from race' and facing hunger/malnutrition of the Brazilian population in line with the theories of national developmentalism; in the period from 1964 to 1984 multi-causal approaches to the determination of the hunger/malnutrition process and finally, in the period from 1985 to 2010, the influence of the conception of the historical-social determination of the health/disease process in nutritional epidemiological investigations (Vasconcelos & Batista-Filho, 2011). This last paradigm seems to be still very current and is in line with the results of this study, which demonstrated a significant prevalence of FPs focused on Nutritional Epidemiology.

This result was also similar to a study by Iriart et al. (2015) that investigated the scientific production of professors affiliated to the graduate program in the Collective Health knowledge core in the 2010-2012 triennium and found a clear highlight in the Epidemiology core. The most influential socio-epidemiological approaches in the world cover specificities of the different stages of human development, from birth to aging. Focusing on adult life, the set of chronic non-communicable diseases has received attention from national Epidemiology (Almeida-Filho, Medronho, & Barreto, 2014).

Within the general context of Public Health as a scientific area, Epidemiology is restricted to 'neutral', 'objective', naturalizing rationality and, in line with the dominant trends of modern science, results in an evident hegemony of this core over the rest of Collective Health (Bosi & Prado, 2011). Having complex research methodologies, especially quantitative, Epidemiology incorporates the phenomena of demographic, epidemiological and nutritional transition, redirecting the focus of research on obesity and chronic diseases unfolding in Nutritional Epidemiology (Bosi & Prado, 2011; Nunes, 2013). For these authors, the Nutritional Epidemiology sub-core is only fixed on its outcome regarding nutritional status by privileging the method to the detriment of theoretical reflections and social approaches to health and food. Such thinking corroborates the results found in this study, in which there was a significant highlight for Nutritional Assessment among the thematic of FNCH.

Several authors report that, despite advances in the professionalization of nutritionists in general and specifically for Collective Health, traditional practices oriented towards curative assistance with a biological focus still predominate, often far from an integral approach, which considers complexity inherent to the food and nutritional phenomenon (Medeiros et al., 2014; Neves et al., 2014; Aguiar & Costa, 2015; Almeida, Oliveira, Monteiro, Medeiros, & Recine 2018). Also, fragmented curricular structures with vertical transmission of knowledge predominate, making dialogue with other sciences difficult.

For Freitas, Minayo, and Fontes (2011), the distancing of the Nutrition area from the themes of food, history, culture, and food customs that influenced habits in Brazil and the world is because of the dominant technicality. A study on the discussion of the community development subject in the Nutrition course curriculum of a public university evidenced the difficulty in understanding the language of social sciences, pointed out as strange and difficult by undergraduate students (Oliveira & Santos, 2014).

This difficulty is also pointed out by other studies, evidencing the secondary position of social sciences in training (Neves et al., 2014), difficulties for professionals in the scope of work in primary care to reflect on the economic, political, social, and culture of the territory in which they work (Aguiar & Costa, 2015) and numerous challenges regarding the development of research in the areas of health, food and nutrition from the perspective of the human and social sciences (Amparo-Santos & Soares, 2015).

In the thematic of Collective Health, we found that only 13.0% of the works were aimed at studying public nutrition policies and that only 1.9% of the FPs focused on public health policies. On the other hand, according to Gabriel et al. (2019), nutrition has been consolidated, above all, through the implementation of public policies and programs that include nutritionists in their scope, with numerous advances in recent years that have influenced the fields of work and professional activity.

Considering the privileged space that nutrition has within the scope of programs and public policies in primary care, we need to understand this space as a fertile area for the development of scientific works. However, this alternative has been little explored in the domains of FPs in Nutrition courses in Rio Grande do Norte. Such space can be translated by the scope of the National Food and Nutrition Policy, the Food and nutrition surveillance and the Food and nutritional security system, actions to promote health and healthy eating, with emphasis to the Food guide for the Brazilian population and initiatives to promote complementary healthy eating, health at school program, actions to control obesity, chronic diseases, and micronutrient deficiency, Matrix of food and nutrition actions in primary care, an approximation of family health strategy and intersectoral actions such as the 'Bolsa família' program (Jaime, Silva, Lima, & Bortolini, 2011).

Based on the low frequency of FPs with a theme related to public health policies, we can assume the distancing of the nutritionist from policies more transversal to health care, such as the National Policy of Primary Care, National Policy of Humanization, and the National Policy of Health Promotion.

This assumption agrees with reports found in the literature about the low use of support materials by these professionals at work in primary care such as the Matrix of food and nutrition actions in primary care and the National Primary Care Policy (Aguiar & Costa, 2015; Figueroa Pedraza & Santos, 2017). Also, a study carried out with nutritionists in the city of São Paulo indicates the perception of insufficient practical activities and discussions on Collective Health and health policies during graduation (Vieira & Cervato-Mancuso, 2015).

In the lack of association between institutional characteristics and the proportion of FPs with interest focused on the core of knowledge of FNCH, this finding demonstrates a certain coherence with the DCN (Brasil, 2001), which applies to any context of higher education in Nutrition. The impossibility to qualitatively analyze scientific production was a limitation of this study due to the methodology adopted. An analysis of this nature could bring more robust notes on the relationship with institutional characteristics.

For Alves and Matinez (2016), it is a great challenge for the Nutrition courses to unfold the conceptions provided in the DCN in pedagogical projects, especially when thinking about a training capable of meeting the development of the skills necessary for the nutritionist to work in SUS. Changes in undergraduate Nutrition courses for the development of these skills have been much more complex than just the inclusion of new subjects or content in different curricular models (Recine, Alves, Monego, Sugai, & Melo, 2018).

Finally, in the teacher qualification profile, there was no association with the proportion of works dedicated to the core of knowledge of FNCH. However, some findings in the literature corroborate data from this study. Research carried out on the profile of productivity scholarship researchers from the National Council for Scientific and Technological Development (CAPES, per its acronym in Portuguese) in the Nutrition area showed that Epidemiology is the third area of research most worked with 12.5% of researchers, following by Collective Health with 7.5% (Pinho, Martelli-Júnior, Oliveira, & Martelli, 2017). Again, Epidemiology is a preferred sub-core, in part, by the researchers' training path.

A study conducted by Reis, Costa-Souza, and Vieira-da-Silva (2018) identified that among permanent professors with training in Nutrition linked to postgraduate programs in Collective Health in Brazil in the 2007-2009 triennium, 73.8 % had their theses directed to the areas of Collective Health or Nutrition, with a nutritional analysis of the population and Epidemiology being the most frequent sub-areas, with 19% and 16.7%, respectively. Although FPs at FNCH were more frequent for professors with specialization or master's degree, it is possible they experienced a similar training process.

Despite the proportion of research in Epidemiology, there is wide openness in the scientific journals of Collective Health for the production of Nutrition, which encompassed about a third of the published scientific articles on Nutrition in journals with an impact factor indexed in the Scientific Electronic Library Online (SCIELO) (Vasconcelos, 2017).

Final considerations

With the results presented and reflections raised, we could identify predominantly positivist characteristics in the studies, which were dedicated to the core of knowledge of interest to FNCH. Among the study themes, an approximation of the Nutritional Epidemiology sub-core and thematic Nutritional Assessment was perceived, more neutralizing aspects of FNCH and less directed at theoretical reflections.

Thinking about the professional performance of the nutritionist within the scope of SUS, the prerogative of training announced in the DCN, a limited approximation of the analyzed researches of the competences and skills necessary for the nutritionist for this practice is identified since there was a significant portion of papers directed only to nutritional diagnosis, with distance from social, human and political issues.

On the other hand, we need to reflect on the path that leads the student to the development of his/her FP and intervening factors, such as research and extension projects developed in the institutions, dialogue with graduate programs, and scientific initiation, which could be the object of future investigations. A perspective of change for the results found would be a closer relationship between teaching and the various spaces of practice within the scope of SUS, including research and extension projects that include research proposals more complex than only nutritional diagnosis.

We need to create opportunities for reflection and resolution of health problems during undergraduate, in order to enable the training of professionals instigated and committed to the improvement of SUS, especially in the historical moment that there are threats to so many rights conquered by the population. In this sense, we suggest adopting a research agenda in undergraduate courses to better distribute efforts and discoveries and translate them into possible improvements for health practices.

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