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Research potential of food and nutrition in the Family Health Strategy: A structured review

Potencialidades da pesquisa em alimentação e nutrição na Estratégia de Saúde da Família: uma revisão estruturada

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ABSTRACT

Objective

Determine the profile of research groups and publications with food and nutrition-related actions promoted by the Family Health Strategy in Brazil since 1994.

Methods

Two procedures were used: structured review and research group search. The former searched the databases Web of Science, Medline, Lilacs, SciELO and Embase, and followed the principles that guide systematic reviews in the Cochrane Collaboration. The references of the selected articles were also consulted. The research groups were searched in the Research Group Directory of the National Council for Scientific and Technological Development.

Results

A total of 54 articles published between 2002 and 2012 in 20 different journals were identified. Ten of these were retrieved from the references section of other articles. Focusing mostly on children from the Southeast region, these studies were coordinated by dietitians, nurses, and physicians. Diabetes *Mellitus*, high blood pressure, and breastfeeding were the most common topics (n=23). The quantitative methodology was employed by 42 articles, most about diagnoses. Only five research groups studied the Family Health Strategy, despite the growing number of studies in the area over the years.

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Conclusion

Despite the growing scientific production, the findings of this structured review indicate that few studies focused on food and nutrition in the Family Health Strategy, probably because of the existence of few research groups in the country. More comprehensive and consistent studies on the topic are needed.

Indexing terms: Family health. Feeding. Nutrition public health. Primary health care. Research groups. Review literature as topic.

RESUMO

Objetivo

Traçar o perfil dos grupos de pesquisa e das publicações que apresentem ações relacionadas à alimentação e nutrição no âmbito da Estratégia Saúde da Família no Brasil a partir do ano de 1994.

Métodos

Dois procedimentos foram explorados: a revisão estruturada e a busca de grupos de pesquisa. A primeira explorou as bases Web of Science, Medline, Lilacs, SciELO e Embase, seguiu os princípios que orientam as revisões sistemáticas da Colaboração Cochrane. Foram ainda consultadas as referências dos artigos selecionados. A busca de grupos de pesquisa foi feita por meio do Diretório de Grupos de Pesquisa do Conselho Nacional de Desenvolvimento Científico e Tecnológico.

Resultados

Foram encontrados 54 artigos originais, sendo 10 identificados na lista de referências, publicados entre os anos de 2002 a 2012 em 20 diferentes periódicos. Sua maior parte foi realizada na Região Sudeste, sob coordenação de nutricionistas, enfermeiros e médicos, com crianças como sujeitos de pesquisa. Diabetes Mellitus, Hipertensão e Aleitamento materno foram os temas mais encontrados (n=23). Foram identificados 42 artigos de pesquisa quantitativa, em sua maioria sobre diagnóstico. Foram encontrados apenas cinco grupos de pesquisa com o tema na Estratégia Saúde da Família, apesar do aumento de pesquisas na área ao longo dos anos.

Conclusão

Apesar da produção crescente, os achados desta revisão estruturada indicaram poucos estudos com foco em alimentação e nutrição no contexto da Saúde da Família, provavelmente devido à existência de poucos grupos de pesquisa no País. É necessário fomentar estudos sobre o tema de maneira mais ampla e consistente.

Termos de indexação: Saúde da família. Alimentação. Nutrição em saúde pública. Atenção primária à saúde. Grupos de pesquisa. Literatura de revisão como assunto.

INTRODUCTION

In the last four decades, the Brazilian population changed its nutritional profile, decreasing the prevalence of childhood malnutrition (although it still persists in low-income families from the Brazilian North Region), the adolescent and adult underweight prevalences, and the stunting prevalence; and increasing the overweight and obesity prevalences in the country, especially in the last decade¹. The coexistence of these problems with the persistence of high prevalences of nutritional deficiencies in children under five years of age and women of childbearing age, such as

hypovitaminosis A (17.4% and 12.3%) and anemia (20.9% and 29.4%)² characterizes the nutritional transition and the double disease burden³.

This situation can be explained by the social and economic transformations that influenced lifestyles, changing the food environment and reducing physical activity. The *Pesquisa de Orçamentos Familiares* (POF, Family Budget Survey) of 2008-2009⁴ found the addition of low-nutrient high-energy foods into the traditional Brazilian diet: more than 90% of the population had low produce (fruits and non-starchy vegetables) intake and 60% to 80% of the population had excessive sugar, sodium, and saturated fat intakes⁴.

On the other hand, the implementation of policies, and encouragement and support programs promoted breastfeeding, increasing the number of breastfed children and the duration of exclusive and total breastfeeding².

In parallel, the prevalences of moderate and severe food insecurity decreased between the 2004 *Pesquisa Nacional por Amostragem em Domicílios* (PNAD, National Household Sample Survey) and the 2009 PNAD, being 6.5% and 5.0%, respectively, in the latter⁵. This decrease was confirmed by the 2008-2009 POF, which found a subtle increase in household satisfaction with the amount and quality of the foods (64.4% and 35.0%) in relation to the 2002-2003 POF (53.0% and 26.5%)⁶.

Along with poor food choices, the 2008 PNAD found that only 28.2% of the population aged more than 14 years was physically active⁶. The *Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico* (Vigitel) 2011 found a leisure-time physical activity rate in adults of 30.0% and a transportation-related physical activity rate of 17.0%⁷.

Given the complexity of the Brazilian nutritional scenario, which tends to increase the incidence and prevalence of chronic Non-Communicable Diseases (NCD)^{8,9}, health care personnel need to be trained to ensure the comprehensiveness of care¹⁰⁻¹². Food and nutrition actions are also capable of favoring the inclusion of health promotion in the political agenda and contribute to this goal¹⁰⁻¹².

In this line, the Brazilian State officially advanced by passing the National Health Promotion Policy¹³ in 2006 to promote quality of life and reduce health vulnerability and risk; the National Primary Health Care Policy also in 2006¹⁴, which prioritized the Family Health Strategy as the definitive proposal for redirecting the health system; and the National Food and Nutrition Policy, in 1999, revised in 2010¹⁵, to improve the population's diet, nutrition, and health by promoting healthy food practices, food and

nutrition surveillance, and preventing and comprehensive care.

Given the various determinants and the combination or overlap of food and nutrition-related problems, preventive actions should attempt an integral and efficiency care instead of the conventional and fragmented practices^{11,16}. Furthermore, the institutional nutrition network in the *Sistema Único de Saúde* (SUS, Unified Health Care System) became stronger, turning primary care into a potential space for the development of actions that encourage and support healthy eating habits and physical activity¹².

In the context of comprehensive health care, the Family Health Strategy emerges in 1994 as an innovative proposal to reorganize the health-care model, a proposal capable of establishing a set of political, social, and economic health-promoting ideas that require: uninterrupted intersectoral partnership; interdisciplinary coordination of actions to treat and prevent disease, and promote health; higher education encouraging multidisciplinary care; and health education emphasized as a reflection-action strategy for promoting citizenship and solidarity¹⁷.

These challenges indicate the importance of proposing the Family Health Strategy as a new model of care and a potential and coherent space for the inclusion and establishment of food and nutrition actions with a cross-sectional approach¹⁰. Hence, this study proposes to trace the profile of the research groups and publications focusing on nationwide food and nutrition-related interventions, diagnosis, or assessment in the context of the Family Health Strategy since 1994.

METHODS

Structured review

A Structured Review was conducted according to the systematic review principles of

the Cochrane Collaboration, which uses predefined methods for identifying, selecting, and critically assessing studies, and collecting and analyzing data¹⁸. Systematic reviews should follow seven steps. The present review followed the first six listed below:

a) Formulating the question: What types of studies include food and nutrition actions in the context of Family Health Strategy?

b) Study search and selection: The searched databases were the Web of Science, *Biblioteca Virtual em Saúde* (BVS) (*Lilacs*, *Medline*, and *SciELO*) and Embase. Original studies conducted in Brazil from 1994 to December 2012 published in any language. The following keywords and their combinations were used for searching the title or abstract: in Portuguese, *nutrição/alimentação*; *Atenção Primária à Saúde/Atenção Básica à Saúde*; *Estratégia Saúde da Família/Programa Saúde da Família*; and in English, *nutrition/food*; *health primary care*; *family health*. The selection of these terms relied on the health science descriptors available at the BVS, and similar terms in the other databases. The keywords used for the food and nutrition area were generic to enable the retrieval of journals with diverse characterizable actions.

c) Critical study assessment: The articles were initially selected by title and abstract, resulting in 151 articles. Next, the methodology was read to make sure the study met the inclusion criteria, namely studies in the Family Health Strategy context that approached food and nutrition actions. These are defined as a set of individual, family, and group actions at the primary care level of the health care system that aim to promote health, prevent and treat disease, and provide rehabilitation¹⁰ attributed to dietitians. These actions may also compose the actions answered by the health care team¹⁰.

Therefore, manuscripts that focused on other health-related themes were also selected, providing they had some specific or cross-sectional actions related to food and nutrition, such as infant care, infant growth and development

monitoring; prenatal care monitoring weight gain; and references to the food intake and counseling, anthropometry, or adherence to non-pharmaceutical treatment of individuals with high blood pressure or diabetes.

Dissertations or theses were not included and the study journals should have at least a Qualis Capes classification of B3 for the area of Collective Health. Studies of populations not covered by the Family Health Strategy were not included, such as: studies based on samples of Primary Health Care Units Clientele, household census, traditional care, vaccination campaigns, polyclinics, Specialized Reference Units, Family Development Center, institutions, and projects linked to universities. The same exclusion criteria were used for studies of families covered only by the *Pastoral da Criança*, private health care insurance, or specific municipal programs such as the *Programa de Suplementação Alimentar* (Food Supplementation Program), and *Programa do Desnutrido* (Program for the Malnourished), among others. This further selection resulted in 44 articles that met the study criteria; another 10 articles were retrieved from their references section, totaling 54 studies.

d) Data collection: The following variables were collected: author, journal, and publication year; location; population, classified according to the municipality size (small, medium, large, and metropolis) provided by the *Instituto Brasileiro de Geografia e Estatística* (IBGE, Brazilian Institute of Geography and Statistics)¹⁹; Family Health Strategy presence in the municipality according to the Unified Health Care System database²⁰; and Family Health Strategy coverage stratified by percentage brackets I - 0% to 20%; II - 20% to 50%, III - 50% to 70%, IV - >70%²¹. Other study variables were the Municipal Human Development Indices (HDI-M)²², classified as medium (0.5 to 0.79) or high (≥ 0.80); study design, methods, sample size, and target population; study objective/theme; education of the first author retrieved from the *Plataforma Lattes* (Lattes Platform) available at the *Conselho Nacional de*

Desenvolvimento Científico e Tecnológico's (CNPq, National Council for Scientific and Technological Development) site²³; the degree of nutritional intervention (diagnosis, health promotion, disease prevention, ambulatory care/treatment/care) or management (control, organization, planning, and supervision) according to the definition provided by the Ministry of Health's *Matriz de Ações de Alimentação e Nutrição na Atenção Básica de Saúde* (Matrix of Food and Nutrition Actions)¹⁰.

e) Data analysis and presentation: the selected studies have different profiles and were grouped and classified according to their design, nutritional care action, and municipal management actions. These data are shown in tables.

f) Data interpretation: after result analysis and tabulation, we discussed the action profiles and applicability; food and nutrition in the context of Family Health Strategy in different types of Brazilian municipalities; the limitations and potentials of such services; and the human resources.

The seventh step regards improving and updating the manuscript after publication, which does not apply to the present study.

Identification of the research groups that investigate about food and nutrition in the Family Health Strategy

*Conselho Nacional de Desenvolvimento Científico e Tecnológico's*²⁴, *Diretórios dos Grupos de Pesquisa* (DGP, Research Group Directory) search tools were used for finding the groups that work on this theme. The tools search not only the database but also census data (2000, 2002, 2004, 2006, 2008, and 2010). For both searches, the following search options were marked: group name, group repercussions, name of the research line, and keywords of the research line. The searched keywords were: collective health/public health; basic care/primary care; family health/community agents together with the terms food/nutrition (*saúde coletiva/saúde pública, atenção*

básica/atenção primária, saúde da família/agentes comunitários, combinadas com os termos alimentação/nutrição). This procedure allowed searching the focus of this review more accurately, beyond the academic area that conceived the study, given that food and nutrition investigations may occur in other academic areas.

To complement the search in the above database, the groups were also searched using an alternative method. The full name of the authors of the articles selected in the structured review was used for finding other groups in which they worked as leaders or researchers.

The groups were selected by reading all the information provided on the group's web page and the objectives of one or more research lines. Studies on the following subjects were excluded: studies on animal food or nutrition, chemical composition of foods, clinical nutrition, food service management, and sports nutrition. When at least one of the research lines regarded the theme, the group was selected.

The following data were collected from the groups that studied primary care or Family Health Strategy with a focus on food and nutrition: year of establishment, predominant area, institution, research lines, and keywords.

RESULTS

Research on food and nutrition in the Family Health Strategy

Fifty-four original articles on some type of Family Health Strategy action related to food and nutrition were analyzed, two in English and all others in Portuguese. Although the search included all studies published since 1994, the 54 selected studies were published between 2002 and 2012, and most (n=40, 74%) were published in the last six years.

Only forty studies reported the data collection period, and these studies were mostly published from one to six years after completion

of data collection. Only one study was published twelve years after completion of data collection.

The articles were found in twenty different journals, seventeen of which were Brazilian. Thirty-three (61.0%) studies were published in public health, collective health, or epidemiology journals. Five were nursing journals, accounting for 24.1% of the publications (n=13). Only four studies were from two different nutrition journals, and another four studies were from specific medical journals.

Most studies were done in the Brazilian Southeast (n=27, 50%), especially in the states of *Minas Gerais* and *São Paulo*. However, the other Brazilian regions were also represented: Northeast with eighteen studies (33%), South with seven studies (13%), Central-West with one study (2%), and North with one study (2%). A total of 44 municipalities were studied, and three studies included more than one municipality (1°=10; 2°=4, and 3°=2). Two articles did not mention the study municipalities. The population in these municipalities varied from three thousand to ten million inhabitants. Seven municipalities were metropolis (>900 thousand inhabitants), eighteen were large (100 thousand to 900 thousand inhabitants), two were medium-sized (50 thousand to 100 thousand inhabitants), and seventeen were small, with less than 20 thousand inhabitants.

The municipalities' Human Development Index (HDI-M) ranged from medium (0.500-0.799, n=34) to high (≥ 0.800 , n=10)²². According to Datasus, 31 municipalities had Family Health Strategy coverage higher than 50%; and of these, 20 had Family Health Strategy coverage higher than 70%²⁰.

The academic education of the first author of the reviewed studies included: dieticians with 16 studies; nurses with 14 studies; physicians with 12 studies; psychologists with 3 studies; physical therapists, dental surgeons, and physical educators with 2 studies each; biologist, occupational therapist, and pharmacist with one study each.

Most studies focused on a specific population, such as children (n=14), health professionals (n=12), older adults (n=5), pregnant women (n=3), mothers (n=3), adults (n=2), and women of childbearing age (n=2). Some studies included more than one type of population, such as adults and older adults (n=8), mothers and children (n=2), mothers and professionals (n=1), and professionals and pregnant women (n=1). One study focused on a child's father.

Some themes can be categorized according to the articles' objectives and the matrix of food and nutrition actions in primary care¹⁰. High blood pressure or diabetes mellitus was the most common topic (n=12, 22.2%), followed by breastfeeding (n=11), nutritional status assessment (anthropometry, n=9), child health or childcare (n=7), prenatal care (n=6), micronutrient inadequacies (n=5), labor (n=2), welfare program (n=1), and general food and nutrition (n=1). Articles about the *Sistema de Vigilância Alimentar e Nutricional* (Sisvan, Food and Nutrition Surveillance System) were not found.

The methods used in the study articles varied: structured or semi-structured interviews with users or professionals; self-administered questionnaires; venous or finger-stick blood tests; stool test; direct anthropometry; direct blood pressure measurement; food intake assessment; field diary; direct observation of health unit structure; and use of scales and tests to measure child development and older adult motor development. The interventions included: iron supplementation; physical activity; Family Health Strategy-related; provision of individual, group, and home care; a strategy called *Atenção Integrada às Doenças Prevalentes na Infância* (AIDPI, Integrated Management of Childhood Illness); and Breastfeeding - Friendly Primary and Prenatal Care Units. The educational intervention proposals used dialogue discourse, demonstration, service practices, lectures, group dynamics, and case studies.

Tables 1, 2, and 3 show the studies. Table 1 lists quantitative or mostly quantitative studies

Table 1. Profile of the quantitative or mostly quantitative studies on disease diagnosis and prevention, and health promotion and care. Brazil, 2003 to 2012.

(1 of 2)

Author, year	Municipalities (n), Region	Size ^a	FHS cover ^b	HDI-M ^c	Sample	Topic	Purpose ^d	Education of the 1 ^o author
Borges & Philippi (2003) ²⁵	(1), SE	M	II	High	41 lactating women	Breastfeeding	D	Nurse
Ferreira <i>et al.</i> (2003) ²⁶	(1), NE	L	III	Medium	293 children aged 6 to 23 months	Micronutrient inadequacy	DP	Nurse
Sousa & Araújo (2004) ²⁷	(1), NE	L	III	Medium	371 children aged 6 to 60 months	Micronutrient inadequacy	D	Nurse
Mano & Pierin (2005) ²⁸	(1), SE	M	II	High	226 records of hypertensives in the FHS or not	HBP/DM	D	Nurse
Parada <i>et al.</i> (2005) ²⁹	(1), SE	S	IV	Medium	166 children aged <1 year	Breastfeeding	D	Nurse
Barbosa <i>et al.</i> (2006) ³⁰	(1), NE	L	IV	Medium	284 older adults	Micronutrient inadequacy	D	Dietician
Maria-Mengel & Linhares (2007) ³¹	(1), SE	L	I	High	120 children aged 6 to 44 months	Child health/care	D	Psychologist
Melo <i>et al.</i> (2007) ³²	(1), NE	L	II	Medium	115 pregnant women	Nutritional status	D	Physician
Nascimento <i>et al.</i> (2007) ³³	(1), NE	L	IV	Medium	315 older adults	Micronutrient inadequacy	D	Dietician
Alves <i>et al.</i> (2008) ³⁴	(1), NE	M	III	Medium	68 children aged 5 to 10 years with BMI $\geq 85^{\text{th}}$	Nutritional status	DP	Physician
Azeredo <i>et al.</i> (2008) ³⁵	(1), SE	S	IV	Medium	36 professionals and 137 mothers of children aged < 24 months	Breastfeeding	D	Dietician
Assunção & Ursine (2008) ³⁶	(1), SE	M	III	High	164 diabetics aged >18 years	HBP/DM	NCT	Physical therapist
Cotta <i>et al.</i> (2009) ³⁷	(1), SE	S	IV	Medium	150 hypertensives, 5 diabetics, and 25 with DM and HBP	HBP/DM	D	Occupational therapist
Giroto <i>et al.</i> (2009) ³⁸	(1), S	L	III	High	385 hypertensive adults and older adults	HBP/DM	D	Pharmacist
Azeredo <i>et al.</i> (2010) ³⁹	(1), SE	MS	III	High	103 anemic children	Micronutrient inadequacy	DP	Dietician
Brecailo <i>et al.</i> (2010) ⁴⁰	(1), S	L	III	Medium	426 children aged <2 years	Breastfeeding	D	Dietician
Felisbino-Mendes <i>et al.</i> (2010) ⁴¹	(1), SE	S	IV	Medium	1332 children aged <10 years	Nutritional status	D	Nurse
Silva <i>et al.</i> (2010) ⁴²	(1), SE	L	I	High	43 diabetic older adults	HBP/DM	D	Nurse
Cristovão <i>et al.</i> (2011) ⁴³	(1), SE	M	II	High	298 adult women	Nutritional status	D	Nurse
Garcia <i>et al.</i> (2011) ⁴⁴	(1), N	S	IV	Medium	164 children aged 6 to 24 months	Nutritional status	D	Dietician

Table 1. Profile of the quantitative or mostly quantitative studies on disease diagnosis and prevention, and health promotion and care. Brazil, 2003 to 2012.

(2 of 2)

Author, year	Municipalities (n), Region	Size ^a	FHS cover ^b	HDI-M ^c	Sample	Topic	Purpose ^d	Education of the 1 ^o author
Cunha <i>et al.</i> (2012) ⁴⁵	(1), CW	S	IV	Medium	80 enrolled in the <i>HiperDia</i>	HBP/DM	D	Physical educator/therapist
Marinho <i>et al.</i> (2012) ⁴⁶	(1), NE	L	IV	Medium	419 non-diabetic adults	Nutritional status	D	Nurse
Ribeiro <i>et al.</i> (2012) ⁴⁷	(1), SE	S	IV	Medium	27 hypertensive women	HBP	HP	Dietician
Soares <i>et al.</i> (2012) ⁴⁸	(1), NE	L	III	Medium	235 older adults	Nutritional status	D	Physical therapist
Ferreira-Marim <i>et al.</i> (2012) ⁴⁹	(1), SE	L	I	High	155 preschoolers aged 2 to 5 years	Nutritional status	D	Dietician
Vianna <i>et al.</i> (2012) ⁵⁰	(1), SE	S	IV	Medium	70 older adults	Nutritional status	DP	Physical educator

Note: ^aSize of the municipality. Source: *Instituto Brasileiro de Geografia e Estatística*, 2007¹⁹; S: Small; MS: Medium-Sized; L: Large, M: Metropolis; ^bSource: DATASUS, 2007; FHS cover: Family Health Strategy coverage as follows: I - 0% to 20%; II - 20 to 50%, III - 50 to 70%, IV - >70%; ^cSource: *Programa das Nações Unidas para o Desenvolvimento*, 2000. HDI-M: Human Development Index of the Municipality classified as medium (0.5 to 0.799) and high (≥0.80); ^dFocus of the food and nutrition actions according to the source Brasil, 2009.

D: Diagnosis; HP: Health Promotion; DP: Disease Prevention; NCT: Nutritional Ambulatory Care/Care/Treatment; HBP: High Blood Pressure; DM: Diabetes Mellitus; SE: Southeast; NE: Northeast; CW: Central West; S: South; N: North.

that performed nutritional care actions, such as diagnosis, health promotion, disease prevention, and ambulatory care/care/treatment. Table 2 also lists quantitative studies, but only those that performed food and nutrition actions typical of local or municipal management. Table 3 shows the qualitative studies and the actions include both nutritional care and management.

Forty-two quantitative studies were found, two mostly quantitative with some qualitative data. Of these, 26 referred to nutritional care actions (Table 1) and 16 to local or municipal management actions (Table 2).

The studies in Table 1 are either interventional (n=5), cross-sectional (n=20), or cohort (n=1). The five intervention studies assessed effectiveness^{26,34,39,47,50}.

Three articles with retrospective information involved the organization of secondary data, one of which combined primary and secondary data. These articles collected data from medical records and health information systems, namely from the

Sistema de Informação da Atenção Básica (SIAB, Primary Care Information System).

Thirteen studies in Table 1 studied location-specific populations, such as subjects living in a district or users of a health service, and another thirteen studies regarded other types of specific populations, such as a sample of Family Health Strategy professionals representative of the municipal Family Health Strategy professional population.

Most quantitative studies (n=20) used nutritional status diagnosis (intake assessment, anthropometric assessment, breastfeeding duration, micronutrient deficiencies) for assessing nutritional care actions. Although mostly quantitative, two studies also presented psychosocial and cultural data (perceived situations, professional practices, and cultural practices). Four investigated disease-prevention methods (prophylactic iron supplementation and practice of physical activity in older adults or obese children), one promoted health (nutritional education for hypertensives),

Table 2. Profile of the quantitative studies that approach food and nutrition actions promoted by municipal or local administration. Brazil, 2002 to 2012.

Author, year	Municipalities	Size ^a	FHS cover ^b	HDI-M ^c	Sample	Topic	Purpose ^d	Education of the 1 ^o author
Cesar <i>et al.</i> (2002) ⁵¹	(2), SE	2 S	2 IV	2 Medium	409 children	Child health/ care	control	Physician
Ciconi <i>et al.</i> (2004) ⁵²	(1), SE	L	II	Medium	61 professionals	Breastfeeding	organization	Biologist
Dubeux <i>et al.</i> (2004) ⁵³	(1), NE	L	II	Medium	40 teams	Breastfeeding	control	Dental surgeon
Faleiros <i>et al.</i> (2005) ⁵⁴	(1), S	L	II	High	112 children	Breastfeeding	control	Physician
Roncalli & Lima (2006) ⁵⁵	(4), NE	-	-	-	2 144 children < 5 years w/ and w/o FHS	Child health/ care	control	Dental surgeon
Araújo & Guimarães (2007) ⁵⁶	(1), NE	M	I	High	135 adults/ older adults with HBP	HBP/DM	control	Physician
Caldeira <i>et al.</i> (2007) ⁵⁷	(1), SE	L	II	Medium	Professionals: 41 with higher education and 152 with high school	Breastfeeding	organization and control	Physician
Lima <i>et al.</i> (2007) ⁵⁸	(1), SE	S	IV	Medium	49 postpartum women and 26 newborns	Child health/ care	control	Nurse
Caldeira <i>et al.</i> (2008) ⁵⁹	(1), SE	L	II	Medium	About 1400 mothers	Breastfeeding	organization	Physician
Cesar <i>et al.</i> (2008) ⁶⁰	(1), S	L	II	Medium	361 pregnant women	Prenatal care	control	Physician
Costa <i>et al.</i> (2009) ⁶¹	(1), SE	S	IV	Medium	33 pregnant women and 35 professionals	Prenatal care	organization and control	Dietician
Lima <i>et al.</i> (2009) ⁶²	(1), SE	M	I	High	472 hypertensives	HBP/DM	planning and control	Physician
Niquini <i>et al.</i> (2010) ⁶³	(1), SE	M	I	High	7 FHCU e 230 pregnant women	Prenatal care	organization	Dietician
Niquini <i>et al.</i> (2012) ⁶⁴	(1), SE	M	I	High	230 pregnant women	Prenatal care	control	Dietician
Cervato-Mancuso <i>et al.</i> (2012) ⁶⁵	(1), SE	M	II	High	123 dieticians from primary care and 51 from NASF	Professional practice	planning and organization	Dietician
Cesar <i>et al.</i> (2012) ⁶⁶	(1), S	L	II	Medium	2395 mothers	Prenatal care	control	Physician

Note: ^aSize of the municipality. Source: *Instituto Brasileiro de Geografia e Estatística*, 2007¹⁹; S: Small; MS: Medium-Sized; L: Large, M: Metropolis; ^bSource: DATASUS, 2007; FHS cover: Family Health Strategy coverage as follows: I - 0% to 20%; II - 20 to 50%, III - 50 to 70%, IV - >70%; ^cSource: Programa das Nações Unidas para o Desenvolvimento, 2000. HDI-M: Human Development Index of the Municipality classified as medium (0.5 to 0.799) and high (≥ 0.80); ^dThe local/municipal management consists of the following elements: planning, organization, management, and control. FHCU: Family Health Care Unit; NASF: Family Health Support Center; HBP: High Blood Pressure; DM: Diabetes *Mellitus*; SE: Southeast; NE: Northeast; CW: Central West; S: South; N: North.

Table 3. Characterization of the qualitative studies on diagnosis, health promotion/care, and management. Brazil, 2003 to 2012.

Author, year	Municipalities	Size ^a	FHS cover ^b	HDI-M ^c	Sample	Topic	Purpose ^d	Education of the 1 ^o author
Felisberto <i>et al.</i> (2002) ⁶⁷	(10), NE	6 S; 1 MS; 3L	2 III and 8 IV	10 Medium	10 coordinators and 146 professionals	Child health/care	MT - control	Physician
Fernandez <i>et al.</i> (2005) ⁶⁸	(1), SE	M	II	High	8 physicians, 8 nurses, 45 CA, 16 nurse assistants	Food and nutrition	MT - organization	Dietician
Alves e Nunes (2006) ⁶⁹	(3), NE	-	-	-	50 appointments with 10 FHS physicians	HBP/DM	HP	Psychologist
Bustamante e Trad (2007) ⁷⁰	(1), NE	M	I	High	6 families with small children	Child health/care	D	Psychologist
Slomp <i>et al.</i> (2007) ⁷¹	(1), S	L	III	Medium	90 newborns	Child health/care	NCT	Nurse
Frota <i>et al.</i> (2009) ⁷²	(1), NE	S	IV	Medium	15 mothers with children aged <1 year	Breastfeeding	D	Nurse
Pontes <i>et al.</i> (2009) ⁷³	(1), NE	M	III	Medium	17 couples and parents of children aged 6 to 8 months	Breastfeeding	D	Nurse
Silva <i>et al.</i> (2009) ⁷⁴	(1), SE	L	II	Medium	15 physicians	Prenatal/child care	NCT	Physician
Araújo <i>et al.</i> (2010) ⁷⁵	(1), NE	S	IV	Medium	11 nurses	HBP/DM	NCT	Nurse
Pinto & Bosi (2010) ⁷⁶	(1), NE	M	I	Medium	8 obese adult females	Nutritional status	D	Dietician
Ramos & Cuervo (2012) ⁷⁷	(1), S	M	I	High	11 PHCU or FHCU coordinators and 12 professionals	Welfare program/HRAF	MT - planning and organization	Dietician
Camossa <i>et al.</i> (2012) ⁷⁸	(1), SE	L	II	High	21 professionals from 2 teams, 6 residents and 1 manager	Professional practice	MT - planning and organization	Dietician

Note: ^aSize of the municipality. Source: *Instituto Brasileiro de Geografia e Estatística*, 2007¹⁹; S: Small; MS: Medium-Sized; L: Large, M: Metropolis;

^bSource: DATASUS, 2007; FHS cover: Family Health Strategy coverage as follows: I - 0% to 20%; II - 20% to 50%, III - 50% to 70%, IV - >70%;

^cSource: *Programa das Nações Unidas para o Desenvolvimento*, 2000. HDI-M: Human Development Index of the Municipality classified as medium (0.5 to 0.799) and high (≥ 0.80); ^dFocus of the food and nutrition actions according to the source Brasil, 2009.

D: Diagnosis; HP: Health Promotion; DP: Disease Prevention; NCT: Nutritional Ambulatory Care/Care/Treatment; The local/Municipal Management (MT) consists of the following elements: planning, organization, management, and control; HBP: High Blood Pressure; DM: Diabetes *Mellitus*; PHCU: Primary Health Care Unit; FHCU: Family Health Care Unit; HRAF: Human Right to Adequate Food; CA: Community Agents; SE: Southeast; NE: Northeast; CW: Central West; S: South; N: North.

and one provided ambulatory care/care/treatment (assistance to diabetics).

Table 2 shows studies with management-attribution actions. Sixteen studies were quantitative, of which four were intervention studies, ten were cross-sectional studies, one was

a cohort study, and one was a community-based trial study. Five of these studies regarded secondary data (two were retrospective) obtained from the child health booklet (which contains a child's health, vaccination, and nutritional data called *Cardeneta da Criança*), medical records,

national health establishment registry, Municipal Health Department and pregnant women's record (*Cartão da Gestante*).

Most studies on management (n=15) consisted of assessments: five studies made impact assessments^{51,54-56,60}; one assessed effectiveness⁵⁹; nine made service assessments, of which one analyzed structure, process, and result⁶¹; three studies approached only two of these dimensions^{53,57,62}; and five assessed only one of these dimensions^{52,58,63-65}. The only study that did not involve an assessment analyzed the dietician's work in a municipality, and whether the municipality had an adequate number of dieticians⁶⁶.

Eleven studies included samples representative of the municipality^{51-53,57,59-61,63-66}, four included specific samples (Health Care Center or Sanitation District)^{54,56,58,62}, and one with regional representativeness included samples of four municipalities of two Brazilian Northeast states⁵⁵.

Regarding management actions (Table 2), nine publications regarded control; three regarded specific organization actions; two regarded organization and control actions; and two regarded planning and control actions.

Table 3 shows the twelve qualitative studies that combined different nutritional care and management actions. Despite their qualitative nature, two had representative samples: the first included coordinators and professionals from ten municipalities in a Brazilian-Northeast state⁶⁷; and the second included physicians from a municipality⁷⁴.

Few studies in this table consisted of assessments. One study assessed structure⁶⁸; two assessed process^{69,77}, and one assessed structure and process⁶⁷.

One of these studies used secondary data sources, namely birth certificates and medical records⁷¹.

Some articles of the tables 1, 2, and 3 analyzed when the Family Health Strategy was

Table 4. Distribution of the research groups by keywords. Brazil, 2000-2012.

Keywords	2000	2002	2004	2006	2008	2010	Database*
CH + Nut	7	19	24	24	21	34	42
CH + Diet	0	2	9	11	10	18	27
CH + Nut + Diet	0	2	8	11	9	18	27
PH + Nut	6	16	23	26	27	33	35
PH + Diet	0	6	10	12	12	14	21
PH + Nut + Diet	0	5	9	10	10	12	19
BC + Nut	0	1	2	2	6	8	9
BC + Diet	0	1	2	2	5	6	5
BC + Nut + Diet	0	1	2	2	4	5	5
PC + Nut	0	2	2	1	1	5	10
PC + Diet	0	2	2	4	3	5	10
PC + Nut + Diet	0	0	0	1	1	3	7
FHS + Nut	2	3	4	9	11	11	10
FHS + Diet	0	1	1	6	8	6	7
FHS + Nut + Diet	0	0	0	3	5	4	5
CA + Nut	0	0	1	1	1	1	1
CA + Diet	0	0	0	0	0	0	1
CA + Nut + Diet	0	0	0	0	0	0	1

Note: *number of research groups found in the database during the search period.

Nut: Nutrition (*Nutrição*); Diet: Diet (*Alimentação*); CH: Collective Health (*Saúde Coletiva*); PH: Public Health (*Saúde Pública*); BA: Basic Care (*Atenção Básica*); PC: Primary Care (*Atenção Primária*); FHS: Family Health Strategy (*Estratégia Saúde da Família*); CA: Community Agents (*Agentes Comunitários*).

implemented in the study municipalities: 1997^{35,39}, 1998⁷⁴, 2000^{29,52}, 2001^{51,70}, and 2002^{40,54,62}.

Research groups

Table 4 shows the distribution of the research groups according to the RGD from 2000 on and the great increase in the area's research capacity. The groups who explicitly cited primary care as a study field of food and nutrition numbered two in 2000, eight in 2002, eleven in 2004, 18 in 2006, 22 in 2008, 24 in 2010, and 26 when the database was consulted. Some groups focused at least one research line in food and nutrition within the Family Health Strategy: one in 2002, two in 2004, three in 2006, four in 2008, seven in 2010, and four in the database.

On the other hand, the search based on tracking the authors' names found another 30

groups that studied food and nutrition in primary care, totaling 54 groups when added to the groups found by keywords, and only two more groups focusing on the Family Health Strategy, totaling five research groups. The research lines of these groups regarding primary care and Family Health Strategy totaled 82 and 8, respectively.

Table 5 shows the characteristics of the research groups found in the database by keywords and author tracking. The year of establishment of the groups that focused on primary care varied considerably, but these groups became more common after 2000. Meanwhile, the groups that focused on Family Health Strategy appeared somewhat recently.

Most groups' institutions are located in the Brazilian Southeast (n=25), Northeast (n=16), and South (n=11) regions, and most of the groups were from the areas of nutrition (n=25), collective/public health (n=18), and medicine (n=11).

Table 5. Distribution of the research groups during the search period according to year of establishment, institution location by Brazilian region, and prevailing academic area. Brazil, 2012.

	Year of establishment (n)		Brazilian region of the institution		Prevailing academic area	
	PHC	FHS	PHC	FHS	PHC	FHS
Base corrente	1976 (1)	1999 (1)	SE (22)	SE (3)	Nutrition (23)	Collective health (2)
	1982 (1)	2002 (1)	NE (15)	CW (1)	Collective health (16)	Nutrition (2)
	1989 (1)	2007 (1)	S (11)	NE (1)	Medicine (10)	Medicine (1)
	1990 (2)	2009 (2)	CW (5)		Others (5)	
	1992 (2)		N (1)			
	1995 (1)					
	1996 (1)					
	1997 (1)					
	1999 (1)					
	2000 (7)					
	2001 (1)					
	2002 (1)					
	2004 (6)					
	2005 (3)					
	2006 (5)					
	2007 (2)					
	2008 (3)					
	2009 (2)					
	2010 (4)					
	2011 (5)					
	2012 (4)					
Total	54	5	54	5	54	5

Note: PHC: Primary Health Care; FHS: Family Health Strategy; SE: Southeast; NE: Northeast; CW: Central West; S: South; N: North.

DISCUSSION

The present results indicated a scarcity of studies on food and nutrition within the scope of the Family Health Strategy. However, other studies may exist since this review aimed to search only in the renowned journals. It is also possible that the Family Health Strategy management in some municipalities conducts only routine diagnoses and assessments, published in technical, not scientific, publications.

The Family Health Strategy was implemented in the municipalities from four to eight years after the agreement between the Ministry of Health and the states and municipalities for the construction of a new model (1994). Family Health Strategy coverage also varied greatly, from 14.5% to 94.0% in the referenced municipalities. Yet, high coverage does not ensure complete implementation of all the actions related to primary care's basic strategy areas⁷⁹.

Family Health Strategy coverage is increasing much more rapidly in small Brazilian municipalities than in medium-sized and large municipalities. The advantage of the small municipalities is that they do not have a previously structured service network^{68,80}. On the other hand, not only do larger municipalities require more organizational, political, and financial resources to reach good coverage, but they also provide care to individuals from other municipalities^{21,80,81}. In fact, the 13 municipalities with less than 50% Family Health Strategy coverage were large cities or metropolises, and 17 of the 21 municipalities with more than 70% Family Health Strategy coverage were small.

In general, the municipalities with the lowest HDI-M had high Family Health Strategy coverage; low HDI-M is a primary requirement for the Ministry of Health to implement the strategy²¹.

Most studies were conducted in Brazilian Southeast municipalities mostly with low Family Health Strategy coverage. The Northeast region

follows with the highest number of studies and highest mean Family Health Strategy coverage²¹. Since the approach regards food and nutrition and Family Health Strategy, the highest number of research groups in the Brazilian Southeast may explain the numerous articles. Search in the DGP confirmed the prevalence of the Southeast in the number of institutions with groups studying primary health care and the Family Health Strategy (Table 5). Nevertheless, numerous groups are also located in the Brazilian Northeast and South.

The information retrieved from the group and research line search confirm the scarcity of studies. Although a significant number of groups study food and nutrition in primary care, the number of groups that focus specifically on the Family Health Strategy is still small. However, focus on Family Health Strategy should be awakened and improved in view of the growing implementation of *Núcleo de Apoio a Saúde da Família* (NASF, Family Health Support Centers) and employment of dieticians in Brazilian municipalities after Ordinance n° 154/2008 was passed⁸².

Research Group Directory-based search has some limitations. Group selection depends on the detailed description of the researchers and respective keywords, and the latter are often used by many research lines. Therefore, it is possible that some groups appear as focusing on primary care when in fact they focus on Family Health Strategy. Another possibility is that some research groups left some fields blank when filling out the form, so they do not appear in any research line.

Time is also a limiting factor even in census-based searches because sometimes a group is inactivated and recertified by an institution, skipping a census. Also, it is not possible to distinguish between ongoing and completed studies in each research line unless the information is updated by the researchers.

Despite these weaknesses and need of improvement, this research tool is critical for disclosing the Brazilian food and nutrition research potential.

Most studies are quantitative, indicating the prevalence of the positivistic approach over the understanding approach as a way of making the area of collective health scientifically legitimate⁸³. However, there were many qualitative or mixed studies with solid methods, showing the academic effort (here, specifically the Brazilian) of making increasingly deep analyses in the health area⁸³.

Nevertheless, the food and nutrition actions in most studies were small and local, as shown by Tables 1, 2, and 3. This situation may impact professional practice. Although dietitians lead many studies, the number of nurses and physicians coordinating studies on food and nutrition was significant.

Among others, nurses have been protagonists in the establishment of the Family Health Strategy. But nurses accumulate many roles, including organizing the teamwork, and administrative and management activities⁷⁵. Hence, the food and nutrition actions they create eventually appear⁷⁵. Boog *et al.*⁸⁴ mention that physicians and nurses find performing nutrition education activities challenging because they do not have the right background for this task and cannot deal with the subjective aspects associated with food intake.

Few studies mention dietitians in the Family Health Strategy teams or supporting them^{35,42,47,77}, despite the fact that other studies have suggested their inclusion in such teams or their working in parallel^{56,78,85}. Nurses' and physicians' limited education in food and nutrition, nurses' excessive workload in the Family Health Strategy, and the absence of a dietitian may suggest the reason for food and nutrition actions appearing diluted in face of other actions more in line with the nurse's or physician's work.

The most common study topics and populations were diabetes mellitus/diabetics and high blood pressure/hypertensives. These individuals were often targeted by actions focusing on anthropometric assessment, salt/sugar restriction recommendations, and

prescriptive recommendations made mainly by physicians or nurses^{38,42,46,56,69,75}. Although not provided routinely, education on healthier lifestyles and food habits was cited as the most effective primary control strategy, and sometimes the only control strategy^{28,38,42,46,62}. In spite of the importance of chronic NCD in the Brazilian nosological landscape, the studies that covered NCD comprehensively and from the viewpoint of multiple sectors were scarce.

Breastfeeding and child care were the second most common topics. Mother and child care has been a governmental priority in public health since the 1940s, and the people's priority since the 1980s, when the people demanded the creation and establishment of health policies⁸⁶. In 2006 child's health officially becomes a strategic area of the National Primary Health Care Policy¹⁴. Health professionals¹⁰ are responsible for health-promoting and disease-preventing food and nutrition actions, including the promotion of breastfeeding, possibly increasing interest on this topic.

However, woman's health care is not yet comparable to the quality of child's health care. The number of prenatal visits, and the quality and extent of this kind of care are yet inadequate, contributing to the persistently high mother mortality rates⁸⁶. Few studies focused on this life stage.

None of the studies sampled adolescents, probably because the public health policies for this population were only introduced in primary care recently. In 2007 the Ministry of Health, together with the Ministry of Education, made possible the institution of health-related actions through the *Programa de Saúde na Escola* (PSE, School Health Program)⁸⁷ and created a care guide and record in 2009⁸⁸. The *Semana Anual de Mobilização Saúde na Escola* (Annual Week for School Health Mobilization) began in 2012 with the topic 'preventing obesity', representing the launching of PSE actions⁸⁹. This may encourage researchers to conduct Family Health Strategy food and nutrition studies on this population.

Although they constitute the National Policy for Food and Nutrition guidelines¹⁵, the theme Sisvan was not approached by any study and the themes on welfare programs (*Programas de Transferência de Renda*) and the Human Right to Adequate Food (HRAF) were approached in only one study. The current context is the persistence of food insecurity⁵; health professionals' feeling of helplessness, little knowledge about their work, and the perceived inability to establish intersectoral cooperation when they come across this reality⁹⁰; and the organizational challenge of coordinating the welfare programs and the programs that encourage access to social rights⁹¹. On the other hand, the Family Health Strategy has reach and allows professionals to access population needs¹⁵ that require further investigation.

Nearly all articles on management regarded assessment, so they were also interconnected with either control (service operation, degree of action implementation, and monitoring of the indicators of the target population) or organization (training and structure)¹⁰. Few studies approached planning and management aspects. These four elements must be balanced for the proper planning and coordination of nutritional care by the different care levels, units, and teams¹⁰.

The other intervention levels defined by the Matrix¹⁰ were mostly on nutritional diagnosis. This situation indicates how food and nutrition actions are restricted to immediate health problem resolution and not comprehensive enough to promote consistent health-promoting changes. Hence, nobody has yet used the principle of comprehensiveness care as a guide to health education actions that consider subjects emancipators and allow action coordination to flow intersectorally¹⁷.

Although focusing on primary care, a recent article⁹² mapped, systematized, and assessed the scientific production in nutrition, and its findings were similar to the present findings. The said article reviewed 117 studies; most used

quantitative research methods (n=106); were published in the last decade (n=75); involved the Brazilian Southeast and South regions (n=69); focused on nutritional diagnosis (n=43); and sampled children (n=45). Studies on HRAF and welfare programs were not found.

CONCLUSION

Studies on food and nutrition in the Family Health Strategy are occasional, and probably were conducted by a few research groups that explore the theme. Food and nutrition actions are limited and local. Greater interest lies in child health-related studies. Generally, most studies on the management of food and nutrition actions explored their control and organization, and studies on nutritional care focused on nutritional diagnosis.

In conclusion, authorities should foment studies that propose more widespread and consistent food and nutrition actions in the Family Health Strategy, especially family- and group-oriented actions that foster the principles of comprehensive health care.

CONTRIBUTORS

IAL VASCONCELOS sought the articles and research groups in the Research Group Directory, wrote the article, and organized the references. LMP SANTOS supervised the work, reviewed the published articles, guided the Research Group Directory search, and helped to write and review the manuscript.

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