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ORIGINAL

Intersectoriality of food and nutrition initiatives: relationship with the prevalence of obesity in the State of *Paraíba*

Intersetorialidade das ações de alimentação e nutrição: relação com a prevalência de obesidade no estado da Paraíba

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ABSTRACT

Objective

To identify the managerial profile and forms of intersectoral articulation in the framework of food and nutrition carried out in Primary Health Care and verify its association with the prevalence of obesity in the three health macro-regions of the State of *Paraíba*.

Methods

Cross-sectional survey carried out in 151 municipalities in *Paraíba*, nested in a national population-based survey. Variables related to the manager, managerial profile, intersectoral forms of articulation, and obesity rates among adults were evaluated according to data from the Food and Nutrition Surveillance System.

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Results

All macro-regions presented a mean of adults obesity higher than the national reference for individual over 18 years of age described in the National Health Plan 2020-2023. The presence of the technician responsible for food and nutrition actions was associated with higher rates of obesity. The performance of food and nutrition education actions, and intersectoral practices related to the Food and Nutrition Security sector were associated with lower prevalence of obesity.

Conclusion

The effectiveness of the actions cannot be guaranteed by the presence of a specific position for the actions. Food and Nutrition Education actions are recommended to reduce the prevalence of obesity.

Keywords: Intersectoral collaboration. Nutrition programs and policies. Obesity.

RESUMO

Objetivo

Identificar o perfil gerencial e as formas de articulação intersetorial relacionadas à área de alimentação e nutrição realizadas na Atenção Primária à Saúde e verificar sua associação com a prevalência de obesidade nas três macrorregiões de saúde do estado da Paraíba.

Métodos

Pesquisa transversal realizada em 151 municípios paraibanos, aninhada em uma pesquisa nacional de base populacional. Foram avaliadas variáveis referentes ao gestor, perfil gerencial, formas de articulação intersetoriais, e índices de obesidade entre adultos de acordo com dados do Sistema de Vigilância Alimentar e Nutricional.

Resultados

Todas as macrorregiões apresentaram média de obesidade em adultos superior à referência nacional para pessoas acima de 18 anos de idade descrita no Plano Nacional de Saúde 2020-2023. A presença do responsável técnico para ações de alimentação e nutrição esteve associada a maiores índices de obesidade. A realização de ações de educação alimentar e nutricional, e práticas intersetoriais relacionadas ao setor de Segurança Alimentar e Nutricional associaram-se a menores prevalências de obesidade.

Conclusão

A eficácia das ações não pode ser garantida pela presença de cargo específico para as ações. Ações de Educação Alimentar e Nutricional são recomendadas para a redução da prevalência de obesidade.

Palavras-chave: *Colaboração intersetorial. Programas e políticas de nutrição e alimentação. Obesidade.*

INTRODUCTION

Considered at the same time a disease and one of the most important risk factors for other Non-Communicable Chronic Diseases, obesity is a disease that has multifactorial causes, involving biological, historical, ecological, environmental, economic, social, cultural and political issues [1]. Obesity is associated with the main causes of death in Brazil, enhancing the risk of diseases such as diabetes, cardiovascular diseases and approximately 13 types of cancer, according to data from the National Cancer Institute [2,3].

In view of the complexity of the factors involved, obesity confrontation requires a diversified effort, and the development of effective and innovative process policies becomes essential [3]. Intersectoral actions, in turn, comprise strategies that seek to improve health levels and propose approaches to public health policies based on an interdisciplinary approach [4].

With regard to food and nutrition, the intersectoral nature of actions is considered important for ensuring fundamental rights, such as the Human Right to Adequate Food, as it requires the setting up of policies that focus on different areas such as: income and access to adequate food and drinking water;

social determinants and health; education and illiteracy control as well as attention to indigenous people and communities [5,6].

In addition, it should be emphasized that developing policies and programs based on this approach becomes important in the intervention on the multifactorial causes of health problems, comprising, for example, one of the recommendations made by international organizations to intervene in the current obesity epidemic [7]. In view of the scarcity of studies in the literature that address this issue, the present study aimed to identify the managerial profile and forms of intersectoral articulation related to the area of food and nutrition carried out in Primary Health Care and to verify their association with the prevalence of obesity in the three health macro-regions of the State of *Paraíba*.

METHODS

This was a cross-sectional study carried out between December 2020 and June 2021 in the State of *Paraíba* municipalities, nested in a national population-based study entitled "Situational diagnosis of programs and actions related to the National Food and Nutrition Policy", carried out in response to Call CNPq/MS/SAS/DAB/CGAN nº 26/2018 – Coping with and Controlling Obesity within the *Sistema Único de Saúde* (SUS, Unified Health System).

The sample calculation, performed and replicated for all states participating in the national study, was developed considering the random sampling plan by cluster, taking into account a 5% marginal error, a confidence level of 95% and definition of four strata according to the size of the population: A- capital cities; B- cities with more than 150 thousand inhabitants, C- cities with 30 to 150 thousand inhabitants; D- municipalities with less than 30 thousand inhabitants.

Altogether, in the State of *Paraíba* there is a total of 1,765 Basic Health Units (BHU) distributed among the state 223 municipalities. The formula used for the calculation determined the sample size based on a finite population with the objective of estimating population proportions and, from the calculations, 642 BHU distributed among the four strata were randomly selected to compose the sample of the matrix study in the State of *Paraíba*. These 642 BHU are distributed in 168 municipalities, covering all the 16 health regions of the state. These municipalities made up the final sample of the present study. After considering 17 exclusions (10.1%) due to incompleteness of the questionnaire, the final review included 151 municipalities.

For each municipality, a technician was selected (technical reference or coordination – coordinator or health surveillance reference; coordinator or primary care reference; coordinator or reference official for food and nutrition in the Municipal Health Department) or, if not available, the professional with higher education in charge of Primary Health Care (PHC) of the Municipal Health Department, to be the manager in charge for the response, in order to obtain an answer for each municipality in the sample.

Data were collected through the application of the questionnaire "Diagnosis of food and nutrition management initiatives in the municipal health sector associated with the care of overweight and obese people in PHC", prepared by the Ministry of Health in partnership with the national project coordinators. The instrument has eight thematic questions blocks, namely: identification, institutional arrangement, governance mechanisms, federative articulation, intersectoral articulation, budgetary and financial resources, training, and social control. A team of investigators from the Federal University of *Santa Catarina* was in charge of making the instrument available in electronic format through the SurveyMonkey® platform, and the triggering of the instrument for the municipalities was on account of the coordinators of the participating states. Access to the questionnaire was released by sending the directing link to the platform,

and the Free and Informed Consent Form was included on the questionnaire's homepage. The participants' agreement was required to proceed with the collection instrument.

Our study used only a part of the aforementioned questionnaire. Variables associated with the municipality and the responding manager (identification block), to management (institutional arrangement block – requiring a specific food and nutrition coordination and technician in charge for the actions) and the intersectoriality of food and nutrition actions (block of intersectoral articulation – to the actions developed and sectors involved). In parallel with the collection of primary data, a survey of secondary data made available by the public reports of the *Sistema de Vigilância Alimentar e Nutricional* (Food and Nutrition Surveillance System) was carried out to identify obesity rates in adults in the State of *Paraíba* and in the participating municipalities. For the purpose of assessment, the obesity averages were calculated by health macro-regions of the state, and were used as cut-off points for the sake of comparison: (I) National reference: reference index for the percentage of adults (18 years and over) with obesity described in the National Health Plan (2020-2023) [8]: 19.8%; (II) State reference: sum of the rates of adult obesity degree (Grade I, II and III) in adults in the State of *Paraíba*, according to the Food and Nutrition Surveillance System database: 29.5%.

Data were reviewed using the SPSS®IBM® software (version 22.0). Initially, a descriptive analysis was performed using absolute and relative frequency for qualitative variables, and mean and standard deviation for the quantitative variables. The normality distribution was based on the Kolmogorov-Smirnov test, Pearson's chi-square test and Fisher's exact test were used, when necessary, in order to evaluate the association between categorical variables. A statistical significance level of 5% was adopted ($p<0.05$).

This research project was approved by the Research Ethics Committee of the State University of *Paraíba*, under opinion n° 3,557,478, CAAE: 17810619.1.0000.5187.

RESULTS

The average age of the responding managers was 37.8±8.9 years, the majority being female (83.4%), self-declared brown complexion (54.3%), occupying, at the time of the application of the questionnaire, the position of coordinator or reference technician in the area of food and nutrition and/or coordinator of primary care in the municipality (78.1%), with an affiliation different from that of a civil servant (59.6%) (Table1). Most participants (49.0%) had received training in nursing and 20.5% in nutrition. Among the respondents, only 1 medical professional was identified (data not tabulated).

There were no statistically significant differences between the three health macro-regions regarding the managerial profile and the main forms of intersectoral articulation associated with food and nutrition actions (Table 2). Most municipalities (78.1%) did not have specific municipal coordination in the area, as the presence of a technician in charge for food and nutrition actions was only available in 58.3% of the sample.

Still in Table 2, it is observed that, out of the total, 85.0% of the managers reported that "their" municipalities planned the development of actions with intersectoral articulation, and 86.7%, stated that they performed the actions. The highest achievement rates were among food and nutrition actions in those schools that adhered to the School Health Program (96.7%), followed by Food and Nutrition Education (FNE) initiatives (94.7%). Actions to control and prevent micronutrient deficiencies exhibited the lowest rates (66.7%).

The presence of a technician in charge in food and nutrition actions was associated with prevalence rates above the national reference in all the municipalities ($p=0.001$) and, specifically, among the municipalities of the third health macro-region ($p=0.045$) (Table 3).

Table 1 – Characterization of the managers participating in the study, stratified by the health macro-regions of the State of *Paraíba*. *Paraíba*, Brazil, 2021.

Variable	1st Macro		2nd Macro		3rd Macro		Total		*p*-value
	Mean±SD		Mean±SD		Mean±SD		Mean±SD		
Age*	38.7±10.2		38.0±8.4		36.8±8.4		37.8±8.9		0.542
	n	%	n	%	n	%	n	%	
Gender									
Female	37	82.2	45	91.8	44	77.2	126	83.4	0.125
Male	8	17.8	4	8.2	13	22.8	25	16.6	
Skin color/Race**									
Yellow	0	0.0	0	0.0	2	3.5	2	1.3	0.122
White	18	40	28	57.1	19	33.3	65	43.0	
Brown	26	57.8	21	42.9	35	62,5	82	54.3	
Black	1	2.2	0	0.0	0	0.0	1	0.7	
Position									
PC and/or FN coordinator or reference	38	84.4	42	85.7	38	66.7	118	78.1	0.029[a]
Others	7	15.6	7	14.3	19	33.3	33	21.9	
Link									
Civil Servant	18	40	19	38.8	24	42.1	61	40.4	0.939
Others	27	60	30	61.2	33	57.9	90	59.6	

Note: *6 participants did not answer the question. **1 participant chose not to indicate his/her skin color. [a]Statistically significant difference between macro-regions 2 and 3 (p=0.023) and 1 and 3 (p=0.041). PC: Primary Care; FN: Foods and Nutrition; M: Mean; SD: Standard Deviation.

Table 2 – Characterization of the managerial profile and the main forms of intersectoral articulation related to food and nutrition actions in the State of *Paraíba*, according to health macro-regions. *Paraíba*, Brazil, 2021.

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Variable	Total				1st Macro				2nd Macro				3rd Macro				*p*
	Yes		No		Yes		No		Yes		No		Yes		No		
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Presence of the Municipal Food and Nutrition Coordination	33	21.9	118	78.1	9	20	36	80.0	12	24.5	37	75.5	12	21.1	45	78.9	0.856
Presence of a technician in charge of food and nutrition actions	88	58.3	63	41.7	27	60	18	40.0	24	49.0	25	51.0	37	64.9	20	35.1	0.243
Articulation of the food and nutrition area with other municipal sectors	120	79.5	31	20.5	35	77.8	10	22.2	38	77.6	11	22.4	47	82.5	10	17.5	0.778
Development stages with intersectoral articulation																	
Action planning	102	85.0	18	15.0	31	88.6	4	11.4	33	86.8	5	13.2	38	80.9	9	19.1	0.581
Resource investment for action	52	43.3	68	56.7	13	37.1	22	62.9	18	47.4	20	52.6	21	44.7	26	55.3	0.659
Action execution	104	86.7	16	13.3	33	94.3	2	5.7	33	86.8	5	13.2	38	80.9	9	19.1	0.209
Evaluation and monitoring	79	65.8	41	34.2	27	77.1	8	22.9	25	65.8	13	34.2	27	57.4	20	42.6	0.177
Actions developed in an intersectoral manner																	
Food and nutrition education	113	94.2	7	5.8	34	97.1	1	2.9	35	92.1	3	7.9	44	93.6	3	6.4	0.643

Table 2 – Characterization of the managerial profile and the main forms of intersectoral articulation related to food and nutrition actions in the State of *Paraíba*, according to health macro-regions. *Paraíba*, Brazil, 2021.

Variable	Total				1st Macro				2nd Macro				3rd Macro				*p*
	Yes		No		Yes		No		Yes		No		Yes		No		
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Promotion of Adequate and Healthy Food	88	73.3	32	26.7	26	74.3	9	25.7	29	76.3	9	23.7	33	70.2	14	29.8	0.809
Control and prevention of malnutrition	92	76.7	28	23.3	27	77.1	8	22.9	27	71.1	11	28.9	38	80.9	9	19.1	0.567
Control and prevention of micronutrient deficiencies	80	66.7	40	33.3	25	71.4	10	28.6	24	63.2	14	36.8	31	66.0	16	34.0	0.749
Control and prevention of obesity/ overweight	107	89.2	13	10.8	30	85.7	5	14.3	35	92.1	3	7.9	42	89.4	5	10.6	0.679
Control and Prevention of Non-Communicable Chronic Diseases	92	76.7	28	23.3	27	77.1	8	22.9	30	78.9	8	21.0	35	74.5	12	25.5	0.886
Food and Nutrition Surveillance	89	74.2	31	25.8	26	74.3	9	25.7	28	73.7	10	26.3	35	74.5	12	25.5	0.996
Monitoring of families and users of the *Bolsa Família* Program	105	84.5	15	12.5	31	88.6	4	11.4	33	86.8	5	13.2	41	87.2	6	12.8	0.973
Food and nutrition actions in schools that joined the SHP	116	96.7	4	3.3	34	97.1	1	2.9	38	100.0	0	0.0	44	93.6	3	6.4	0.260
Sectors that articulate with the area of Food and Nutrition																	
Agriculture/ Agrarian Development	37	30.8	83	69.2	12	34.3	23	65.7	9	23.7	29	76.3	16	34.0	31	66.0	0.513
Social Assistance	106	88.3	14	11.7	33	94.3	2	5.7	33	86.8	5	13.2	40	85.1	7	14.9	0.415
Culture	20	16.7	100	83.3	6	17.1	29	82.9	4	10.5	34	89.5	10	21.3	37	78.7	0.416
Education	118	98.3	2	1.7	35	100.0	0	0.0	38	100.0	0	0.0	45	95.7	2	4.3	0.206
Private Initiative	12	10.0	108	90.0	4	11.4	31	88.6	3	7.9	35	92.1	5	10.6	42	89.4	0.866
Charitable or religious institutions	35	29.2	85	70.8	11	31.4	24	68.6	10	26.3	28	73.7	14	29.8	33	70.2	0.885
Environment	18	15.0	102	85.0	5	14.3	30	85.7	3	7.9	35	92.1	10	21.3	37	78.7	0.226
Public Ministry	29	24.2	91	75.8	13	37.1	22	62.9	8	21.1	30	78.9	8	17.0	39	83.0	0.094
NGOs	20	16.7	100	83.3	5	14.3	30	85.7	7	18.4	31	81.6	8	17.0	39	83.0	0.891
Food and nutrition security	65	54.2	55	45.8	20	57.1	15	42.9	19	50.0	19	50.0	26	55.3	21	44.7	0.812
Local legislative power	15	12.5	105	87.5	5	14.3	30	85.7	5	13.2	33	86.8	5	10.6	42	89.4	0.875

Note: NGOs: Non-Governmental Organizations; SHP: School Health Program.

Table 3 – Association between the managerial profile and the main forms of intersectoral articulation related to food and nutrition actions with the prevalence of obesity in adults in the health macro-regions of the State of *Paraíba*. *Paraíba*, Brazil, 2021.

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Variable	Total					1st Macro					2nd Macro					3rd Macro				
	<Nat. Ref.		>Nat. Ref.		*p*	<Nat. Ref.		>Nat. Ref.		*p*	<Nat. Ref.		>Nat. Ref.		*p*	<Nat. Ref.		>Nat. Ref.		*p*
	n	%*	n	%		n	%	n	%		n	%	n	%		n	%	n	%	
Presence of the Municipal Coordination of FN	1	8.3	32	23.0	0.465	0	0.0	9	22.0	0.569	1	100	11	22.9	0.245	0	0.0	12	24.0	0.325
Presence of a technical officer in FN actions	12	100	76	54.7	0.001	4	100	23	56.1	0.138	1	100	23	47.9	0.490	7	100.0	30	60	0.045
Articulation of the FN area with other municipal sectors	10	83.3	110	79.1	1.000	4	100	31	75.6	0.561	1	100	37	77.1	1.000	5	71.4	42	84.0	0.594
Development stages with intersectoral articulation																				
Action planning	8	80	94	85.5	0.645	4	100	27	87.1	1.000	0	0.0	33	89.2	0.132	4	80.0	34	81.0	1.000
Resource investment for action	2	20	50	45.5	0.184	1	25.0	12	38.7	1.000	0	0.0	18	48.6	1.000	1	20.0	20	47.6	0.362
Action execution	8	80	96	87.3	0.621	4	100	29	93.5	1.000	0	0.0	33	89.2	0.132	4	80.0	34	81.0	1.000
Evaluation and monitoring	6	60	73	66.4	0.734	4	100	23	74.2	0.553	0	0.0	25	67.6	0.342	2	40.0	25	59.5	0.638
Actions developed in an intersectoral manner																				
Food and nutrition education	9	90	104	94.5	0.465	4	100	30	96.8	0.886	0	0.0	35	94.6	0.079	5	100.0	39	92.9	0.708
Promotion of Adequate and Healthy Food	8	80	80	72.7	1.000	3	75.0	23	74.2	1.000	1	100	28	75.7	1.000	4	80.0	29	69.0	1.000
Control and prevention of malnutrition	8	80	84	76.4	1.000	4	100	23	74.2	0.553	0	0.0	27	73.0	0.289	4	80.0	34	81.0	1.000
Control and prevention of micronutrient deficiencies	6	60	74	67.3	0.730	2	50	23	74.2	0.561	1	100	23	62.2	1.000	3	60.0	28	66.7	1.000
Control and prevention of obesity/ overweight	9	90	98	89.1	1.000	4	100	26	83.9	1.000	1	100	34	91.9	1.000	4	80.0	38	90.5	0.445
NCD control and prevention	7	70	85	77.3	0.697	4	100	23	74.2	0.553	1	100	29	78.4	1.000	2	40.0	33	78.6	0.097
Food and Nutrition Surveillance	9	90	80	72.7	0.450	4	100	22	71.0	0.553	1	100	27	73.0	1.000	4	80.0	37	73.8	1.000
Monitoring of families and users of the *Bolsa Família* Program	8	80	97	88.2	0.612	3	75.0	28	90.3	0.399	1	100	32	86.5	1.000	4	80.0	37	88.1	0.511

Table 3 – Association between the managerial profile and the main forms of intersectoral articulation related to food and nutrition actions with the prevalence of obesity in adults in the health macro-regions of the State of *Paraíba*. *Paraíba*, Brazil, 2021.

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Variable	Total				*p*	1st Macro				*p*	2nd Macro				*p*	3rd Macro				*p*
	<Nat. Ref.		>Nat. Ref.			<Nat. Ref.		>Nat. Ref.			<Nat. Ref.		>Nat. Ref.			<Nat. Ref.		>Nat. Ref.		
	n	%*	n	%		n	%	n	%		n	%	n	%		n	%	n	%	
Food and nutrition actions in schools that joined the SHP	9	90	107	97.3	0.297	4	100	30	96.8	1.000	1	100	37	100.0	-	4	80.0	40	95.2	0.292
Sectors that articulate with the FN area																				
Agriculture/ Agrarian Development	4	40	33	30.0	0.496	2	50	10	32.3	0.594	0	0.0	9	24.3	1.000	2	40	14	33.3	1.000
Social Assistance	10	100	96	87.3	0.604	4	100	29	93.5	1.000	1	100	32	86.5	1.000	5	100	35	83.3	1.000
Culture	3	30	17	15.5	0.368	2	50	4	12.9	0.128	0	0.0	4	10.8	1.000	1	20	9	21.4	1.000
Education	10	100	108	98.2	-	4	100	31	100.0	-	1	100	37	100.0	-	5	100	40	95.2	1.000
Private Initiative	0	0.0	12	10.9	0.596	0	0.0	4	12.9	1.000	0	0.0	3	8.1	1.000	0	0.0	5	11.9	1.000
Charitable or religious institutions	1	10	34	30.9	0.278	0	0.0	11	35.5	0.285	0	0.0	10	27.0	1.000	1	20	13	31.0	1.000
Environment	1	10	17	15.5	1.000	1	25.0	4	12.9	0.477	0	0.0	3	8.1	1.000	0	0.0	10	23.8	0.569
Public Ministry	2	20	27	24.5	1.000	2	50	11	35.5	0.618	0	0.0	8	21.6	1.000	0	0.0	8	19.0	0.571
NCDs	0	0.0	20	18.2	0.210	0	0.0	5	16.1	1.000	0	0.0	7	18.9	1.000	0	0.0	8	19.0	0.571
Food and nutrition security	5	50	60	54.5	1.000	3	75.0	17	54.8	0.619	0	0.0	19	51.4	1.000	2	40	24	57.1	0.644
Local legislative power	3	30	12	10.9	0.111	2	50	3	9.7	0.089	0	0.0	5	13.5	1.000	1	20	4	9.5	0.445

Note: *% Within the prevalence (below the National Ref. and/or above the National Ref.); FN: Food and Nutrition; Nat. Ref.: National Reference for the percentage of adults (18 years and over) with obesity described in the National Health Plan (2020-2023): 19.8%; NCDs: Non-Communicable Chronic Diseases; NGOs: Non-Governmental Organizations; SHP: School Health Program.

When the state obesity average was used as a cut-off point (data not tabulated), the development of intersectoral actions with the food and nutrition security sector yielded lower obesity rates (p=0.007) among the municipalities of the second health macro-region; likewise among the municipalities of the third macro-region carrying out FNE actions (p=0.050).

The obesity averages in the first and second macro-regions were above the references used as the cut-off point for comparison, 32.7% and 31.0%, respectively; only the third macro-region was below the state cut-off point, with an average of 27, 8%.

DISCUSSION

This study aimed to review the managerial profile and the forms of intersectoral performance in connection with food and nutrition, seeking to test its association with the prevalence of obesity in adults among the health macro-regions of the State of *Paraíba*. As for the profile of the responding managers,

there is a predominance of professional nurses and females in coordination positions, corroborating what was described by Peiter *et al.* [9] who, when surveying the information described in the literature about the profile of local PHC management, found a majority of women over 30 years of age and nurses with specialization. These authors highlight, as a possible related factor, the professional nurse ability to unite care, management and assistance within an interdisciplinary, intersectoral and multiprofessional vision. In this perspective, nursing is also mentioned as one of the categories that are most linked to the BHU management process [10].

The lack of articulation of the area of food and nutrition with other municipal sectors, present in 20.5% of the sample, should constitute a warning for such municipalities, considering the complexity that involves the food and nutrition subject, as well as highlighted among one of the principles of the National Food and Nutrition Policy, Social Determination and the interdisciplinary and intersectoral nature of food and nutrition [11, p. 23, own translation][2]:

> Awareness of the socioeconomic and cultural determinations of food and nutrition of individuals and communities contributes to the construction of ways of accessing adequate and healthy food, collaborating with the change in the food production and consumption model that determine the current epidemiological profile. Seeking integrality in nutritional care presumes articulation between different social sectors and constitutes a possibility of overcoming the knowledge fragmentation and social and institutional structures, in order to respond to the food and nutrition problems experienced by the Brazilian population.

Regarding the obesity outlook within the state's health macro-regions, the high rates, when considering the cut-off points used in our study, in all macro-regions, point to the magnitude of the problem also at the state level. No previous studies were identified in the literature that would allow the data comparison, however, it is assumed that the indices in the state are consistent with the growth trend seen nationally and worldwide [12-14]. According to the analysis of the temporal trend of obesity prevalence in Brazilian capitals between 2006 and 2019 carried out by Silva *et al.* [15], obesity rates increased by 3.8% per year in the aforementioned period. In this process of nutritional diagnosis and consequent feeding of information systems that allow the monitoring of the referring indexes, the participation of a qualified and participative technical area can be a crucial factor.

None of the initiatives taken was associated with the mean prevalence of obesity when the national reference value was used as a comparison parameter. However, one of the findings requires attention: contradictorily, when reviewing the Food and Nutrition management profile, the presence of the technician in charge of Food and Nutrition actions was associated with higher obesity prevalence rates. According to the SUS Municipal MANAGER's Handbook, one of the manager's challenges is to interact with the plurality of groups and social actors that relate to health policies, requiring improvement of performance techniques aimed at proposals that ensure the efficiency of actions, but also the consolidation of links between services and the population [16]. However, it is noteworthy that, despite the technical representative being present in 58.3% of the municipalities, only in 21.9% of the municipalities was there an officially formalized Food and Nutrition Coordination, a fact that indicates an organization fragility in the area that can directly reflect on the work process of this Coordination and, consequently, on the effectiveness of the actions.

[2] In the original text: O conhecimento das determinações socioeconômicas e culturais da alimentação e nutrição dos indivíduos e coletividades contribui para a construção de formas de acesso a uma alimentação adequada e saudável, colaborando com a mudança do modelo de produção e consumo de alimentos que determinam o atual perfil epidemiológico. A busca pela integralidade na atenção nutricional pressupõe a articulação entre setores sociais diversos e se constitui em uma possibilidade de superação da fragmentação dos conhecimentos e das estruturas sociais e institucionais, de modo a responder aos problemas de alimentação e nutrição vivenciados pela população brasileira.

When talking about the implementation of policies and actions, it is necessary to keep in mind the complexity and all the factors involved in this process, such as the influence of the decisions taken by the administrative actors involved, as highlighted by Gomes *et al.* [17, p. 41, own translation][3]:

> The complexity of policy implementation [...] stems from the fact that a number of factors influence the behavior of implementing agents: from macro aspects (institutional design of a policy, the instruments or tools chosen, the social, economic or cultural conditions of a society, *etc*.) to micro (decisions made by bureaucrats and other societal players – that is, individuals – within their local connections and realities and in their day-to-day administrative routines).

Still in this framework, it is emphasized that just deliberating actions and tasks is not enough, and the execution of a strategic planning is essential, since the answer will depend on factors such as collective and organizational conditions that can be considered at this stage [18].

Most municipalities, among those that indicated that the food and nutrition area articulates with other municipal sectors, indicated that the area in question participated in the actions planning and execution stages. There was, however, a reduction in the number of municipalities when observing the evaluation and monitoring of initiatives. It is noteworthy that, as important as planning for the process of building health and the consequent improvement of the SUS system, the evaluation and monitoring of the actions carried out allow not only to identify problems and propose solutions, but, above all, to generate changes that raise the quality standard in the most different services employed [19,20].

When considering the state obesity mean as the cut-off point, an association was identified between the development of intersectoral FNE actions with lower obesity rates in the municipalities of the 3rd macro-region. As one of the fields of action of Food and Nutrition Security as well as Health Promotion, FNE strategies have been considered fundamental parts in the process of prevention and control of different nutritional and food problems [21], so that studies described in the literature report results consistent with such an association, with the performance of FNE actions having an impact on the nutritional status and/or anthropometric measurements of the individuals participating [22-24].

The association found between the participation of the food and nutrition area in intersectoral actions with the FNE sector and lower obesity rates among municipalities in the second macro-region (average cut-off point for state obesity) is consistent with the fact described by Mazur and Navarro [25]. There is indeed an association between food insecurity and obesity, since the increase in the supply and access to unhealthy foods can contribute to an increase in body weight and, consequently, lead to the development of obesity.

CONCLUSION

The findings of our study pointed to the managerial role often assumed by the professional nurse. The lack of specific coordination in the area in most municipalities was notorious, as well as the relationship between the existence of a specific position for food and nutrition initiatives and higher obesity rates. It is, therefore, important to train the workforce and carry out continuing education actions, as well as the regular evaluation of the results of the actions to identify flaws in the process and consequent set the basis for changes, as needed.

[3] In the original text: A complexidade da implementação de políticas [...] advém do fato de que inúmeros fatores influenciam o comportamento de agentes implementadores: desde aspectos macro (desenho institucional de uma política, os instrumentos ou ferramentas escolhidas, as condições sociais, econômicas ou culturais de uma sociedade *etc*.) até micro (decisões tomadas por burocratas e outros atores societais – isto é, indivíduos – em seus contextos e realidades locais e em suas rotinas administrativas cotidianas).

The observation data of the obesity outlook within the health macro-regions of the State of *Paraíba*, not described so far in the literature, highlights the importance of efficient and effective strategies focusing on this problem, given the high rates compared to the national reference of obesity for individual over 18 years of age described in the National Health Plan (2020-2023). The results pointed to the association between the performance of FNE actions and low rates of obesity, and the use of such a strategy with a focus on prevention and health promotion aiming at reducing the prevalence of obesity was suggested.

Finally, in view of the difference between macro-regions regarding the association of some variables related to intersectoriality and obesity rates, further studies are suggested, focusing on this subject that complies with this relationship; however, considering possible confounding factors not observed as environmental, epidemiological and management characteristics of the municipalities, considering the differences between the health regions of the state. It is also worth noting that our study reviewed only the obesity rates; the study of the impact of intersectoriality on overweight and excess weight indices (overweight and obesity) for a better understanding of the observed relationship is required.

CONTRIBUTORS

FCT MELO and DF CARVALHO participated in all stages of the development of the article: conception and design of the study, data collection, analysis and interpretation of data, review and approval of the final version of the article.

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