

Profile of food and nutrition technical areas in Mato Grosso do Sul, Brazil: decision making organization

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Abstract *The aim of the present study was to analyze the management organization of food and nutrition actions in the municipalities of Mato Grosso do Sul. This is a descriptive-exploratory study carried out in Mato Grosso do Sul, in which each municipal food and nutrition manager answered questions about performance, governance and financing profile. Data analysis applied frequency, chi-square test and decision tree tools. All cities were included (n=79). Most of the participants were female (92.4%), white (62%), nurses (45.6%) or nutritionists (36.7%). Financial management proved to be so incipient in the state since specific food and nutrition funding was neglected. The absence of a technical area in the municipality's organizational chart was consistent with the lack of knowledge of actions, goals and resource allocation. Their presence coincided with having formally appointed technical managers, municipal food and nutrition policy, goals and elaboration of specialized materials. The present study also proposed a decision tree pointing that having a nutritionist in the team led to a positive result. The failures found in this study partly clarify the causes of the unsettling situation in the state. Our findings can support the creation of intervention strategies.*

Key words *Health Services Administration, Primary Health Care, Nutrition Programs and Policies, Health Management*

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Introduction

The National Food and Nutrition Policy (Brazilian acronym PNAN), approved in 1999, encompasses a set of public policies aiming to improve food, nutrition and health conditions, and treat the problems related to those conditions, as an effort to guarantee health and Food and Nutrition Security (FNS) of the Brazilian population, through guidelines of nutritional care actions within the scope of Primary Health Care (PHC) of the Unified Health System (Brazilian acronym SUS)¹.

In order to organize Nutritional Care and approximate to the PNAN, in a resolute way, the Technical Areas of Food and Nutrition (Brazilian acronym ATAN) were established as responsible for the management of programs and Food and Nutrition Actions (FNA), and adequacy of local singularities, whether at municipal, state or regional level. According to the PNAN guidelines, ATAN must prioritize some specific topics, such as nutritional care organization, promotion of healthy eating, cooperation and articulation for the FNS, and the qualification of professionals and teams workforce^{1,2}.

ATAN composition must be diversified in terms of training background and food and nutrition actions must involve the entire territory that covers nutritional care. When instituting municipal ATAN, it is necessary to consider the issues faced by the food and nutrition scenario in recent decades related to major political, economic, social and environmental changes that have led to the pattern transition of food consumption and, consequently, Brazilian health. The PNAN, in its 2011 revised version, draws attention to the nutritional transition, which is related to socio-economic changes that influence the population's dietary profile (rapid urbanization, improved access to health care, increased schooling and purchasing power of the population), which caused a decline in the level of physical activity, a decrease in the consumption of *in natura* or minimally processed foods and an increase in the consumption of ultra-processed products¹.

Nutritional transition is related to reduction in the rates of malnutrition, child stunting and micronutrient deficiencies, but, at the same time, Brazil faces a significant increase in overweight and obesity: in 2019, the country already presented 63% of the adult population with overweight and 28.5% was diagnosed with obesity, meaning one of the biggest current public health problems^{1,3}. In Mato Grosso do Sul (MS) state, the frequencies of overweight or obese adults were even

higher than the national average, 36.6% of the population are obese and 64.5% is overweight. It is also noteworthy that MS is the third state with the most cases of obesity in the country and the first in the number of deaths attributable to being overweight, represented by 959.7 deaths per million inhabitants^{3,4}.

In the same way, the Surveillance of Risk and Protection Factors for Chronic Diseases by Telephone Survey (Brazilian acronym VIGITEL) reveals an increase in risk factors related to diet, with an unfavorable evolution between 2006 and 2021, such as overweight/obesity, abusive consumption of alcohol, hypertension and diabetes, which are problems directly linked to ATAN actions in the country^{5,6}.

In order to encourage healthy eating habits of the population, among other strategies to reduce cases of overweight and obesity within the PHC, it is necessary to invest time, human resources and dedication in the organization of municipal health management. This is important for planning of actions by technicians trained in overweight and obesity management, preferably organized and formalized as ATAN, with the correct allocation of resources, aiming to increase resolutivity of one of the main challenges that SUS has been facing in recent years: excess weight and Chronic Non-Communicable Diseases (CNCDS), which reduce the general life expectancy of Brazilians by three years, being responsible for 74% of premature deaths. By considering only SUS outlay in 2019, approximately 1.5 billion *reais* were attributable to overweight/obesity, equivalent to 22% of the entire amount spent on NCDs^{3,4}.

Despite being essential, ATAN composed by qualified members is difficult to achieve, due to the unpreparedness of professionals to work with health management. According to a study on work management⁷(p.13), this scenario is due to "limitations imposed by a deficient training process, which does not prepare professionals to accept and act in the perspective of the management model proclaimed by SUS; precarious infrastructure; and bonds and remuneration practiced", which can be referred to the lack of a culture of incentive and of attributing importance to the management organization.

Considering the need to map management actions on food and nutrition (FN) in order to optimize health actions, the aim of the present study was to analyze the organization of management of food and nutrition area actions in the municipalities of Mato Grosso do Sul.

Materials and methods

Descriptive-exploratory, cross-sectional study with a quantitative approach and based on primary data, developed in MS, with all 79 municipalities – most of them (n=65) with less than 30 thousand inhabitants –, at the end of 2020, in amid the COVID-19 pandemic, while its incidence started to grow again in the state, with a higher risk of hospitalization and/or death among people with NCDs. All ATAN managers were invited to participate in the study, totaling 79 participants (total sample universe), one per municipality, according to the order of preference: 1) manager of the FN area; 2) PHC manager; 3) Municipal Secretary of Health (MSH). This preference was determined in view of the greater proximity of the manager of the FN area with the questionnaire's agenda, without excluding the municipalities that do not have this position and/or function in the municipal health department (MSH).

Data collection was conducted online, between October and December 2020. State Technical Management of Food and Nutrition (GEAN) intermediated contact with municipal technical managements, so that they could return the study to diagnose the state. Data collection was carried out using the questionnaire "Diagnosis of the Management of Food and Nutrition Actions in Municipalities" available at SurveyMonkey® tool.

This questionnaire was prepared in partnership between the Ministry of Health and Higher Education Institutions, in 2019, exclusively to diagnose PNAN implementation in the municipalities with decentralized application throughout the country.

Data collection included: 1) Personal and professional characterization of the manager (race, sex, employment relationship, basic education, current position/function, length of service); 2) Management organization and participation in decision-making processes (formal indication of technical responsibility by the FNA, participation in decision-making processes in the municipality); 3) Governance, documents and guiding tools (actions and goals, presence of municipal FN policy, elaboration of guidance materials and protocols on FNA); and 4) Financial/budgetary management (planning and monitoring of financial resources in the area, monitoring of bidding processes for FNA, receipt of incentives for FNA and location of allocation of financial resources received).

Data were transformed into continuous and categorical units when necessary. Data analysis

was carried out in descriptive statistics by measures of frequency, average and dispersion to describe overall data and diagnosis of PHC management in the state of MS; exploratory analysis was conducted aiming to better understand, create hypotheses and further investigate this poorly explored object.

Data analysis was performed using R Studio 1.4.1717® software. Chi-square test was conducted to compare cities grouped into "with" and "without ATAN", considering significance level of 5% ($p \leq 0.05$). In order to verify the effect of the existence of Technical Responsible (TR) formally appointed to ATAN in the municipalities, an analysis of the information value of each of the variables of the survey was carried out and, based on the variables considered relevant and statistically significant, a decision tree algorithm was built, using software *rpart* package.

This study was approved by the Ethics Committee for Research on Human Beings of the Federal University of Mato Grosso do Sul (CEP/UFMS), report 3,981,748 (CAAE: 20532419.0.0000.0021) and all participants who agreed to participate in the study signed the Free and Informed Consent Term online.

Results

All 79 managers responsible for ATAN or FNA in the municipalities of MS participated in the survey. As main characteristics observed, most managers are women (92.4%) and self-reported being white (62%). Nursing and nutrition were the two most common professions among managers, representing 45.6% and 36.7%, respectively.

At the time of completing the questionnaire, most participants were in the position or role of PHC coordinator or reference in the municipality (58.2%) and more than half had been in such positions or functions for two years or less (55.7%). The most commonly reported employment relationship among the responding managers was municipal civil servants (74.7%).

Regarding the characterization of municipal ATAN in MS, municipalities that reported presence of a technical area established in the MSH organization chart had more formally indicated RT (82.8%) when compared to municipalities that reported that ATAN did not exist in the organization chart of the MSH ($p < 0.001$).

Among the municipalities with a TR by ATAN (n=40), 60% reported working for less than 3 years (n=24), most of them were nutri-

tionists (n=34; 85%) and more than half of them participated in the decision-making processes of HSE planning and management (n=27; 67.5%). Other characteristics of the MS managers and ATAN can be seen in Table 1.

Regarding governance and guiding documents on FNA characterization, it is observed that, among the municipalities that reported having ATAN as part of the MSH organization chart, actions and goals in the nutrition area were more frequently foreseen in the Municipal Health Plan (75.9%), in the Annual Health Plan (65.5%), in the Annual and Quadrennial Management Reports (58.6%) and in the Multiannual Plan (55.2%). It is also noteworthy that, among the municipalities that did not institute ATAN, more ignorance regarding food and nutrition goals in the “Annual and Quadrennial Management Reports” (40.8%; $p=0.006$) and in the “Multiannual Plan” was found (32.7%; $p=0.028$) when compared to the municipalities with instituted ATAN.

When asked about having a municipal food and nutrition policy to guide the MSH performance in food and nutrition agenda, it was observed that MSH that established the ATAN in the organizational chart presented more positive responses about the conduction of FNA in PHC than the other municipalities ($p=0.034$). The same was observed when the municipality was asked about the inclusion of food and nutrition goals in the Municipal Multi-Year Plan ($p=0.017$) and if the municipality prepared PHC guidelines/guides/manuals ($p=0.043$). Further information about governance and guiding documents characteristics of MS municipalities can be found in Table 2.

Regarding characterization of the financial/budgetary management of FNA, we found that planning and monitoring were held in less than half of the municipalities, regardless of whether or not having ATAN in the organization chart, but the latter reported greater insipience in the financial/budgetary issue area (with ATAN 3.4% vs 14.3% without ATAN). Most municipalities do not have frequent meetings with the budget management area to allocate resources to FNA (56.4%) and it was also evidenced that they do little or no monitoring and requesting of the bidding process related to the area.

Regarding the receipt of Financing for Food and Nutrition Actions (FAN) and financial incentive to support the structuring of Food and Nutrition Surveillance (VAN) actions, it can be noted that most municipalities, regardless of the ATAN institution, report that do not know if they

receive the federal financial incentive for AAN (60.3%) and surveillance in the area (61.5%). More information on MS AAN financial and budget management is provided in Table 3.

Regarding the allocation of resources to FNA in the municipalities of MS, for the year 2019, by comparing the group that reported having ATAN in the organizational chart to those with no ATAN, we observed differences for “Anthropometric Assessment of the general or specific population” ($p=0.003$), “Acquisition and maintenance of anthropometric equipment” ($p=0.004$), “Actions for diagnosis, prevention and control of nutritional deficiencies” ($p=0.012$), “Actions for diagnosis, Prevention and Control of Malnutrition” ($p=0.044$), “Training health workers in actions related to food and nutrition” ($p=0.039$) and for “Evaluation of food consumption” ($p=0.017$), with the groups being different significantly in the “I don’t know” category for those who reported not having ATAN. The other results on the allocation of FNA resources by the municipalities in the state can be seen in Table 4.

Regarding the characterization of the promotion of permanent and continuing FNA education in the state, we observed that, in general, 66.7% of the municipalities reported that the MHS encourages action on the prevention and control of overweight. When comparing municipalities with or without ATAN, there was no difference between the groups (79.3% vs 59.2%, respectively; $p=0.197$), as well as when asked if FNA contributed to the planning and completion of in-service training focused on obesity, NCD or Promotion of Health and Adequate and Healthy Food (PHAHF) (48.3% vs. 30.6%; $p=0.589$).

When analyzing the decision tree, illustrated in Figure 1, from the questioning about existence of a professional formally appointed for FN agenda in the municipality, we observed that the absence of nutritionists in the FN team, associated with the respondent’s lack of knowledge about the existence of FN goals in annual and multi-annual plans (accuracy of 80%) and lack of knowledge of the existence of nutritional therapy protocols (accuracy of 67%) pointed to the absence of a professional formally appointed as responsible for the FNA. On the other hand, a municipality with nutritionists on the team and informed about both issues mentioned above (they knew how to say “yes” or “no”) corroborated with the existence of a formally appointed manager (accuracy of 82%).

By looking at the decision tree, municipalities with nutritionists in the FN team, existence of a

Table 1. Characterization of food and nutrition managers and technical areas of in the municipalities of MS, 2020.

Variables	n	%
Characterization of food and nutrition the technical area managers (n=79) ^a		
Sex/Gender		
Female	73	92.4
Male	6	7.6
Color/race ^b		
White	49	62.0
Brown	29	36.7
Black	1	1.3
Profession (basic graduation)		
Nursing	36	45.6
Nutrition	29	36.7
Other ^c	11	13.9
No graduation	3	3.8
Current position or role		
PHC coordinator or reference in the municipality	46	58.2
Coordinator or reference of Food and Nutrition at MHS	31	39.2
Primary Care Manager	1	1.3
Municipal secretary	1	1.3
Length of service in current position or role		
Up to 2 years	44	55.7
3 to 5 years	13	16.5
6 to 8 years	12	15.2
10 years or more	10	12.7
Employment relationship		
Municipal public servant	59	74.7
Contract	16	20.3
Others	4	5.2
Characterization of the food and nutrition technical areas (n=78) ^d		
Is there a technical responsible person formally appointed for all food and nutrition actions in the MHS?		
Yes	40	51.3
No	32	41.0
I don't know	6	7.7
If yes, what is the training of the technician responsible for the food and nutrition area? (n=40)		
Nutrition	34	85.0
Nursing	4	10.0
Other ^e	2	5.0
How long has the technical manager in the area been in the position? (n=40)		
3 years or less	24	60.0
4 to 9 years	11	27.5
10 years or more	6	15.0
Does the area participate in MHS planning and management decision-making processes? (n=40)		
Yes, formal and regular participation	15	37.5
Yes, informal but regular participation	12	30.0
Occasionally (occasionally or when requested/summoned)	1	2.5
No	12	30.0

PHC=Primary Health Care; MHS=Municipal Health Secretary. ^aValues describe municipal ATAN managers of Mato Grosso do Sul included in the study, therefore there was no sampling. ^bManagers did not mention other ethnicities. ^cTraining referred to as other: administration, social assistance, biomedicine, pharmacy, physiotherapy, dentistry and pedagogy. ^dData did not include the city of Coronel Sapucaia (manager did not complete the fifth section of the questionnaires). ^eProfessions referred as other: Administrator and Community Health Agent.

Table 2. Characterization of governance and guiding documents used in the management of technical areas (n=78).

Variables	Existing ATAN (n=29)		Non existing ATAN (n=49)		P
	n	%	n	%	
Food and nutrition actions and goals are planned:					
In the Municipal Health Plan					
Yes	22	75.9	28	57.1	0.250
No	3	10.3	9	18.4	
I don't know	4	13.8	12	24.5	
In the Annual Health Plan (PAS)					
Yes	19	65.5	21	42.9	0.136
No	4	13.8	14	28.6	
I don't know	6	20.7	14	28.6	
In the Annual and Quadrennial Management Reports					
Yes	17	58.6	11	22.4	0.006*
No	6	20.7	18	36.7	
I don't know	6	20.7	20	40.8	
In the Multiannual Plan (PPA)					
Yes	16	55.2	22	44.9	0.028*
No	11	37.9	11	22.4	
I don't know	2	6.9	16	32.7	
Does the municipality have a food and nutrition policy that guides the actions of the MHS on the subject?					
Yes	10	34.5	6	12.2	0.034*
No	17	58.6	33	67.3	
I don't know	2	6.9	10	20.4	
Are there food and nutrition targets included in the municipal PPA?					
Yes	16	55.2	14	28.6	0.017*
No	9	31.0	14	28.6	
I don't know	4	13.8	21	42.9	
Does the municipality prepare PHC protocols/guides/manuals?					
Yes	22	75.9	23	46.9	0.043*
No	6	20.7	21	42.9	
I don't know	1	3.4	5	10.2	
Does the municipality have one or more nutritional therapy protocols?					
Yes, with the participation of the food and nutrition area	13	44.8	18	36.7	-
Yes, without the participation of the food and nutrition area	1	3.4	1	2.0	
No	15	51.7	21	42.9	
I don't know	0	0.0	9	18.4	

MHS=Municipal Health Secretary; PPA=Multiannual Plan. *Chi-square test p value<0.05.

Source: Authors.

professional manager is associated to greater report of ATAN's participation in the decision-making processes of MHS planning (accuracy of 67%). When there is no formalized and/or regular participation in management and planning, higher probability of not having someone formally appointed to FN (89% accuracy) was found.

Discussion

Information about the professionals leading ATAN or FNA in the municipalities of MS showed that most of them were white, female, nurses or nutritionists, with an employment relationship with municipal civil servants, respon-

Table 3. Characterization of the financial/budgetary management of the food and nutrition technical area (n=78).

Variables	Existing ATAN (n=29)		Non existing ATAN (n=49)		P
	n	%	n	%	
Does the Food and Nutrition area plan and monitor the budgetary/ financial management of resources allocated to the area?					
Yes, plans and/or monitors	14	48.3	13	26.5	0.083
No	14	48.3	29	59.2	
I don't know	1	3.4	7	14.3	
Does the Food and Nutrition technical area participate in meetings with the budget management area on processes under its responsibility?					
Yes, always (often)	4	13.8	4	8.2	-
Yes, sometimes (eventually)	10	34.5	12	24.5	
No	15	51.7	29	59.2	
I don't know	0	0.0	4	8.2	
Does the Food and Nutrition area request and monitor bidding processes related to your area?					
Yes, requests and follows up	6	20.7	12	24.5	-
Yes, just requests	3	10.3	2	4.1	
Sim, just follows up	3	10.3	2	4.1	
No	17	58.6	28	57.1	
I don't know	0	0.0	5	10.2	
Does the municipality receive financial incentives from the Federal Government of the Food and Nutrition Fund?					
Yes	5	17.2	7	14.3	0.207
No	10	34.5	9	18.4	
I don't know	14	48.3	33	67.3	
Does the municipality receive financial incentives from the federal government to structure the Food and Nutrition Surveillance?					
Yes	5	17.2	5	10.2	0.377
No	9	31.0	11	22.4	
I don't know	15	51.7	33	67.3	

Source: Authors.

sible for PHC and had been working for a short time in that position/function.

The proportion of people of color or white race in the management of FNA (62%) is higher than that found in the MS population (47.3%), resulting in lower proportions than those observed in the state for all other colors or races⁸. According to a report from the Brazilian Institute of Geography and Statistics (Brazilian acronym IBGE), this situation reflects social inequality in the country, in which non-white people represent most of the workforce in Brazil. However, the rate of underutilization of such force is always higher in this population, regardless of education level, in addition to being the majority in informal occupations (65.4%) and the minority in

managerial positions (31.4%). Furthermore, average monthly income of white employed people was 73.9% higher than the other colors/race. It is noteworthy that wage inequality remained in both formal and informal occupations in 2018, also at all levels of education and when considering income per hour worked⁹. Regarding the FN point of view, this repeated profile seen among FN managers can represent a tool to reinforce social inequalities, and the inclusion and vision of the problems that social inequality causes in people's food and nutritional status can be interpreted only under the bias of a historically more privileged population group.

Women occupied 92.4% of ATAN manager positions or the role of representative of the FN

Table 4. Area topics for which financial resources were allocated in the last year (n=78).

Variables	Existing ATAN (n=29)		Non existing ATAN (n=49)		P
	n	%	n	%	
Anthropometric assessment of general and/or specific populations					
Yes	22	75.9	21	42.9	0.003*
No	6	20.7	11	22.4	
I don't know	1	3.4	17	34.7	
Acquisition and maintenance of anthropometric equipment					
Yes	20	69.0	18	36.7	0.004*
No	8	27.6	15	30.6	
I don't know	1	3.4	16	32.7	
Actions for diagnosis, prevention and control of nutritional deficiencies					
Yes	17	58.6	17	34.7	0.012*
No	10	34.5	14	28.6	
I don't know	2	6.9	18	36.7	
Diagnostic, prevention and control actions towards overweight and NCDs					
Yes	15	51.7	20	40.8	0.253
No	8	27.6	10	20.4	
I don't know	6	20.7	19	38.8	
Structuring information systems					
Yes	15	51.7	19	38.8	0.058
No	11	37.9	13	26.5	
I don't know	3	10.3	17	34.7	
Diagnosis, prevention and control actions towards malnutrition					
Yes	13	44.8	19	38.8	0.044*
No	12	41.4	11	22.4	
I don't know	4	13.8	19	38.8	
Health workers training in food and nutrition actions					
Yes	15	51.7	16	32.7	0.039*
No	12	41.4	18	36.7	
I don't know	2	6.9	15	30.6	
Promotion of adequate and healthy food (PAAS)					
Yes	13	44.8	14	28.6	0.052
No	13	44.8	18	36.7	
I don't know	2	6.9	17	34.7	
Food consumption assessment					
Yes	10	34.5	12	24.5	0.017*
No	16	55.2	17	34.7	
I don't know	3	10.3	20	40.8	
Acquisition of educational material for food and nutrition education activities					
Yes	7	24.1	7	14.3	0.084
No	18	62.1	24	49.0	
I don't know	4	13.8	18	36.7	

NCD=Noncommunicable diseases. *Chi-square test p value<0.05.

Source: Authors.

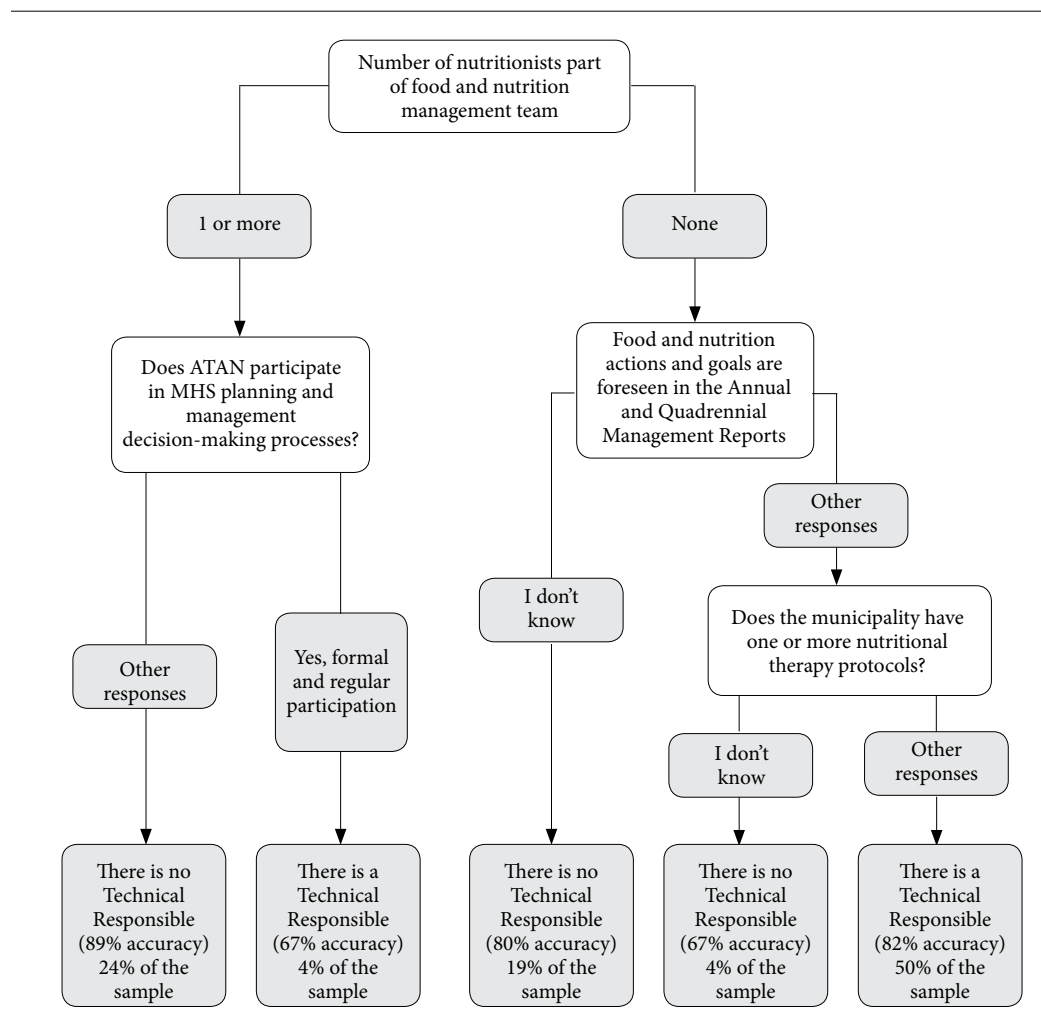


Figure 1. Decision tree – Probability of the existence of a technically responsible person formally appointed for all food and nutrition actions in the Municipal Health Secretary.

Source: Authors,

area in municipalities where there is no formed ATAN. This result was expected since, according to the National Council of Municipal Health Departments (Brazilian acronym CONASEMS) and the last IBGE census, women represent the majority of health workers, including management positions in the public and private health sectors. It is worth noting that the main professions found in the present study were nurses and nutritionists, careers in which women exceed 80% and 90% of participation, respectively^{10,11}, reinforcing the idea that care is considered a female role in today's society.

Although nursing and nutrition are the most common professions found in these positions, what stands out is the existence of managers with

training outside the health area or even without completed higher education (the latter only was found in municipalities where the ATAN was not present in the SMS organization chart), being opposite of PNAN guideline stating that managers and other health professionals must be qualified for the implementation of FNA. This idea is reinforced by the length of experience in the position, since more than half of the managers had been in the position or function for a maximum of 2 years, meaning a recent role in the municipality or a high turnover of human resources. Both hypotheses are problematic, since the FNA should be inserted and organized in the municipalities for decades, considering that PNAN was approved in 1999¹, and that the high turnover

of professionals in public health services might impair their quality, as it discourages the elaboration of medium and long-term strategies and plans, and hampers their execution, by preventing the continuity and longitudinality, so important principles in this context¹².

Our results reinforce the idea that ATAN institutionalization in the municipalities potentially improves organization, planning and involvement of the FNA within the management of nutritional care, preparation of territories to manage diseases and nutritional problems and expansion of comprehensive care to SUS users. These goals can be achieved by presenting FN actions and goals in plans/reports, preparing PHC protocols, guides and/or manuals and presenting RT formally indicated to the FNA, with participation in MHS decision-making processes.

The definition of FN goals demands knowledge about this topic, updated diagnosis of the territory (including estimates and progressions) and the human, material and structural resources accessed by the MHS. The presence of such goals in the plans and reports of the municipality refers to the relevance that it attributes to the area, with systematic monitoring that bases the elaboration of strategies so that the results are always satisfactory and/or progressive, and, thus, perceived, recognized and encouraged. The importance of the formal indication of TR by the area will be discussed later, by looking at the decision tree.

The development of PHC protocols, guides and manuals, as well as access to these materials, approaches managers and professionals to scientific evidence that is so crucial to decision-making in health. According to Becker *et al.*¹³, consulting scientific evidence would hardly occur in other ways, since most managers point out difficulties in accessing scientific journals due to lack of time, high cost or not knowing how to choose the best available options. Furthermore, decision-making processes participation clearly allows real transformations, adjustments, investments and improvements to FN area management and, consequently, to the health/nutrition service and results for users.

On the other hand, not institutionalizing ATAN in the organization chart might weaken nutritional care management because by lacking of a base centered specific policy, FN care, which is gradually essential in the current Brazilian epidemiological scenario, can be established in a disorganized way or be limited to restricted demands, such as consultations for weight loss, lectures on hypertension and diabetes, income transfer and

micronutrient supplementation programs. The latter measures are important, but should not be the only actions taken¹. For the effective implementation of actions and strategies, in addition to the recognition of their importance by health professionals, it is necessary to give access to its validation policy, permanent and/or continuing education and reflections on democratic management, with shared decision-making¹⁴.

In the same way, the lack of FN goals in planning or the lack of knowledge about them impairs the prioritization, qualification and monitoring of actions in the area, leading to impaired health promotion management, disease prevention and their management, and thus systematically impairing SUS.

Regarding FNA in general, it is important to highlight that the monitoring of FN issues by a well-established and organized ATAN enables identifying which aspects need more attention and resources, including financial issues, thus increasing the effectiveness of services and improving the territory diagnosis. However, as mentioned above, financial and/or budgetary management is a weakness of the FN area in the state, which results from the lack of monitoring of resource management and bidding processes in the area and/or non-existent or reduced frequency of meetings with the area financial/budget management team to discuss the use of the FN budget. As most municipalities reported not knowing whether they receive financing of food and nutrition actions (Brazilian acronym FAN) and food and nutrition surveillance (FNS), the scarcity of these meetings is congruent, because, since the management of the FN area is unaware of the financial support available, funding actions and equipment will hardly be organized. In this sense, failures in ATAN's administrative coordination, such as professional unpreparedness and consequent underutilization of financial resources, have weakened the technical management, hampering at least half of the management objectives¹⁵.

In contrast to the large-scale ignorance of managers in relation to FNA, we noted that FNS, a resource instituted through Ordinance No. 2,975 of December 14, 2011, for the purchase of anthropometric equipment¹⁶, was present in 73 of the 79 municipalities, with values of up to 85 thousand reais in the year 2020, according to the State Health Department of Mato Grosso do Sul¹⁷. Regarding FAN, a resource to assist in the structuring and implementation of food and nutrition actions, which previously only benefit-

ed municipalities with more than 150 thousand inhabitants, started to cover municipalities with more than 30 thousand inhabitants after Ordinance No. 1,012 of May 18 from 2020¹⁸. Thus, FAN, available to only two municipalities in the state, covered another twelve municipalities, totaling only 20% of the state supported by this financial incentive. In short, the actions of surveillance and food and nutrition education, health promotion, prevention, monitoring, treatment and rehabilitation, mainly related to overweight and obesity, including the acquisition of adequate equipment for the integral care of this population (with dimensions and capacities inclusive, aiming at comfort, safety and non-stigmatization of the obese person) were underutilized in the state, since a large part of the municipalities that should have FNS and/or FAN in order to expand the resolution, scope and access, underutilized this budget due to lack of preparation/information of managers in relation to FNA.

In addition to these specific and targeted resources, less than half of the municipalities claimed to reallocate resources to the FN topics, except for the anthropometric assessment of general or specific populations. This was probably reported due to the obligation of carrying out anthropometric evaluation in the beneficiaries of *Bolsa Família* Program (Brazilian acronym PBF) that was replaced by the *Auxílio Brasil* Program, regulated by Decree No. 10,852, of November 8, 2021¹⁹. It is worth noting that, among the topics that do not receive resources from most municipalities, are PHAHF actions, diagnosis, prevention and control of overweight and NCDs. This is opposite to the current endemic situation of overweight/obesity and other related chronic conditions, which demand urgent, comprehensive and continuous management strategies, with a view to improving, not only the health of the population, but also reducing the costs of outpatient procedures and hospitalizations, which cost more than BRL 23 million in 2019 (25.5% of spending on NCDs), not to mention other costly consequences of such negligence⁴.

When considering the differences between municipalities, it is clear how cities without ATAN established in the organizational chart have the highest rate of ignorance about the allocation of resources to “Anthropometric Assessment of the population or with specific clippings”, “Acquisition and maintenance of anthropometric equipment”, “Actions for diagnosis, prevention and control of nutritional deficiencies”, “Actions for diagnosis, prevention and control of Malnu-

trition”, “Training of health workers in actions related to AAN” and “Evaluation of food consumption” agendas. In other words, not even managers or representatives of the area in these municipalities could answer whether permanent and/or continuing education and a large part of food and nutritional assessment were receiving financial resources for their development, monitoring and qualification.

In general terms, the lack of information about the area for which one is responsible might be due to the short time management position; professional unpreparedness due to the lack of permanent/continuing education and/or academic training in aspects related to management and especially to financial and budgetary issues; the lack of organization of the area, such as not having ATAN in the organizational chart; the lack of municipal public policy and/or manual provided by the MHS about the duties of the position; the work overload that makes it difficult to monitor the entire scope of the area, especially when assigned to just one individual, instead of a multidisciplinary team and, even greater, when management and top-level actions are both centralized in the same person; the difficulty or lack of personal interest of the manager, among other possible reasons.

The technique known as “Decision Tree” stands out for being widely used in decision-making systems applied to health, in view of its rapid concepts learning and easy implementation^{20,21}. Regarding the decision tree algorithm, it is possible to note that the formal indication of a professional to FN area of the municipalities is essential, as it determined the absence/presence of nutritionists in the team (professional trained to manage and conduct FNA), the lack of knowledge or knowledge within the city hall’s organizational chart about FN goals within the annual and multi-annual management plans, and lack of knowledge or knowledge of nutritional therapy protocols to serve the population. Considering the nutritional transition context¹, worsen of risk factors for NCDs^{5,6} and the record for deaths attributable to being overweight of MS⁴, it is necessary to rethink the organization of nutritional care from a institutionalized perspective by city halls and MHS.

As limitations of our study, we highlight accessing municipalities across the state during the COVID-19 pandemic period. It was quite challenging to obtain accurate and informative responses. Furthermore, the present study was conducted using a sample of the 82 questions col-

lected from these managers (about 1 and a half hour to complete) possibly leading to overload and possible misunderstanding of some questions by the managers, since the study period coincided with a profound transformations in PHC management due to the pandemic. Finally, we consider that the online survey might generate doubts about the content of some questions, and the respondent may be confused or leave some questions blank. However, we believe data was not compromised, since the research was fully adhered to by all MS municipalities.

It is important to note that this is a pioneering study in the area. Due to the lack of previous published data about the relationship among FN management, the challenge of underfunding and the epidemiological situation, in state and national level, the discussion of our findings relied on publications on topics beyond health science, mainly because we recognize the importance of evidence-based management for better allocation of financial and human resources leading to a more effective control of multifactorial health problems such as obesity.

Thus, we showed that in the municipalities of Mato Grosso do Sul with nutritionists in the FN

team, the existence of the professional manager was linked to the greater report of ATAN's participation in the decision-making processes of MHS planning, which is positive and important for the challenges linked to FN that permeate the PHC, by considering problem solving practice.

In addition, it was clear that the financial/budgetary dimension represents a great weakness in the management of FNA in MS, especially in municipalities that did not include ATAN in the MHS organizational chart. And the simple fact of knowing how the resources are directed is *per se* a great advantage of the municipalities with ATAN in comparison to other cities, since they present more control of the situation, organization, planning, prioritization and monitoring the management of the area, and distributing resources according to the most urgent demands in order to try to achieve better and more efficient results.

Finally, we highlight the importance of formalizing a RT to the FN area, especially someone who is trained in FN topics to face the problems related to the burden of malnutrition found in PHC and that consume considerable resources from the SUS.

Collaborations

All authors are responsible for the content of the article and approved its final version.

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