

SIG Tel@ Amazônia: promoting dialogue between specialists and primary care professionals in maternal and child health

SIG Tel@ Amazônia: promovendo a interlocução entre especialistas e profissionais de Atenção Básica na saúde materno-infantil

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ABSTRACT

The Brazilian Indigenous Health Survey showed an increase in birth rates but also found an increase in deaths from malnutrition in early childhood. The study aimed to assess the effectiveness of an educational intervention involving primary care and childcare professionals' training on breastfeeding for indigenous infants. A cross-sectional panel-type descriptive study to assess breastfeeding interventions was conducted in two Special Indigenous Health Districts (SIHDs) of Amazonas State (Upper Rio Solimões and Upper Rio Negro) in 2018. The analysis compared the preintervention (January-June) and postintervention (September-December) periods in the two SIHDs and compared the intervention SIHDs with one SIHD that did not receive the intervention (Middle Rio Purus SIHD). As a result, there was a growth in lactation consultations after the intervention, with a 2,398% increase in Upper Rio Solimões and a 423% increase in Upper Rio Negro. Although the results show no evidence of early weaning, exclusive breastfeeding was ongoing for indigenous infants over six months of age. The participatory focus of the project's awareness-raising workshop guaranteed the health teams' active involvement. The Ministry of Health promotes training activities on the importance of counseling young indigenous women. However, the results show some

uncertainty that this service is happening in the indigenous communities served by these SIHDs. Breastfeeding in indigenous peoples presents challenges that require specific public health interventions. Regarding the involvement of leaders and health professionals, there is an expectation of breastfeeding improvements in the region.

Keywords: Human Development, Food and Nutrition Security, Child Health, Indigenous Peoples .

RESUMO

O Inquérito Nacional de Saúde Indígena mostrou aumento nas taxas de natalidade bem como incremento nas mortes por desnutrição na primeira infância na Amazônia. O estudo objetivou avaliar a efetividade de intervenções educativas, envolvendo a capacitação de profissionais de saúde sobre aleitamento para bebês indígenas. Um estudo descritivo do tipo painel transversal foi desenvolvido para avaliar intervenções em amamentação em dois Distritos Sanitários Especiais Indígenas (DSEI) do Estado do Amazonas (Alto Rio Solimões e Alto Rio Negro) em 2018. A análise comparou a pré-intervenção (janeiro-junho) e período pós-intervenção (setembro-dezembro) nos dois locais e comparou os DSEI de intervenção com outro DSEI que não recebeu a intervenção (Médio Rio Purus). Como resultado, observou-se crescimento das consultas de lactação após a intervenção, com aumento de 2.398% no Alto Rio Solimões e de 423% no Alto Rio Negro. Embora os resultados não mostrem evidências de desmame precoce, o aleitamento materno exclusivo estava em andamento para crianças indígenas maiores de seis meses de idade. O enfoque participativo da oficina de sensibilização do projeto garantiu o envolvimento ativo das equipes de saúde. O Ministério da Saúde promove ações de capacitação sobre a importância do aconselhamento a jovens indígenas. No entanto, os resultados mostram incerteza de que esse serviço esteja acontecendo nas comunidades indígenas atendidas por esses DSEI. A amamentação entre povos indígenas apresenta desafios que requerem intervenções específicas de saúde pública. Existe a expectativa de melhorias no aleitamento em virtude do envolvimento de lideranças femininas e profissionais de saúde na atividade.

Palavras-chave: Desenvolvimento Humano, Segurança Alimentar e Nutricional, Saúde da Criança, Povos Indígenas .

1 INTRODUCTION

Numerous studies have documented the historically unfavorable and increasingly unequal health and living conditions of indigenous peoples in Brazil and especially in Amazonas (Garnelo et al. 2020). In recent decades, the country has implemented programs for new social and health policies for indigenous peoples, aimed at fighting poverty and reducing the gap between indigenous peoples and the rest of Brazilian society (Santana and Cardoso 2020). Although some progress has been reported, it is crucial to record the delays, setbacks, and new health challenges for indigenous communities, which motivated us to review the current approach, with an emphasis on breastfeeding.

One of the most significant difficulties in providing an overview of the indigenous peoples' health is the lack of a system to record vital and health events that reflects their ethnic diversity (Chávez et al. 2007; Cruz and Coelho 2012; Garnelo et al. 2020). We assume that the overall health situation of indigenous peoples involves new challenges that will be extremely difficult to resolve considering the demographic and epidemiological processes in transition. New social, economic, ecological, and political factors are generating radical and abrupt changes in traditional communities.

All public policy planning for indigenous peoples should guarantee and propose intercultural health actions that solve their emerging problems while respecting their traditional worldviews and healthcare methods. Such policies should reestablish healthcare priorities and strategies for the indigenous mothers that the indigenous health system cares for (Cárdenas et al. 2017).

Persistent biomedical and ethnocentric schemes (Hammersley and Atkinson 1983) with little regard for the indigenous peoples' reality have led to health interventions that clash with the patients' needs according to their multicultural diversity. Moreover, health is conceived as a priority for comprehensive and humane care, since the problem is not experienced in its essence, which hinders the integration of Western and traditional knowledge to benefit more vulnerable populations (Siqueira et al. 2006), such as indigenous peoples. The current health system is rigid and rooted in Western medicine; it has failed to conceive of a more respectful alternative to approach intercultural health and comprehensive care for indigenous peoples in a way that would value, respect and recognize their traditional knowledge and human rights (Cárdenas et al, 2017; Sartori and Leivas 2017). This fact highlights the importance of culturally appropriate healthcare, guaranteeing efficacy and respect for customs in pursuit of a common goal, improving the indigenous population's quality of life, and emphasizes that their cultural values including the feeding of indigenous infants, have been threatened (Silva et al. 2019).

Additionally, reports and inquiries from 2000 to 2015 described a nutritional transition in which mothers and babies have become significantly affected by anemia and malnutrition (Garnelo and Welch 2009; Coimbra et al. 2013; Cardoso et al. 2015). Among the causes, there were changes in their dietary habits, replacing traditional food and exclusive breastfeeding with the ultra-processed and industrialized foods with low nutritional value that has become available in the villages (Piperata et al 2011).

The stunting rate among indigenous groups in 2013 was two to five times higher than that among nonindigenous groups in the country. Poor sanitation, insufficient

nutrient intake, and less access to primary health services are possible factors contributing to this problem. UNICEF highlights that the Amazon is the worst place in the country to have a child because of the high rates of infant mortality due to malnutrition and other health problems. All health indicators in the Amazon have worse values than the Brazilian average values; and the most critical situation is in rural areas (UNICEF 2019). Between 2008 and 2017, the food and nutrition surveillance system of the Brazilian Unified Health System - SUS recorded a high prevalence of height-for-age deficits among the indigenous population of the state of Amazonas, which must be addressed by public policies with racial and regional approaches (Mourão et al. 2020).

We conceived the *Tel@ Amazônia Special Interest Group: telehealth action for food and nutritional security of mothers and infants of the forest* research program in the state of Amazonas. The *SIG Tel@ Amazonia* (2017-2019) study focused on the participation of traditional midwives on healthcare professional teams. It aims to investigate aspects of the transition from the traditional infant diet to the introduction of ultra-processed food in indigenous Amazon (Souza and Villar 2018). Two field visits and a series of remote classes took place in the cities of Tabatinga and São Gabriel da Cachoeira; these classes were held in regional health treatment centers. Both regions are residential territories that house people with strong oral traditions and different cultures. The traditional lands of the indigenous peoples straddle the borders between Brazil, Colombia, and Peru (Ruiz et al 2020; Alves and Justamand 2021).

The current specific study thus aimed to assess the effectiveness of an educational intervention involving the training of primary care and childcare professionals on breastfeeding for indigenous infants in Brazil.

2 MATERIAL AND METHODS

Study design

We conducted a repeated-panel descriptive observational study, which is a hybrid design that combines cross-sectional and cohort study designs. This approach involves conducting cross-sectional studies at different times in the same population without necessarily repeating observations on the same individuals. This type of study is indicated for the evaluation of the effectiveness of a population intervention (Kelsey et al. 1996; Kleinbaum et al. 1982).

The outcomes of interest were the increase in the lactation consultations of indigenous infants up to 12 months of age and greater adherence to exclusive

breastfeeding up to 6 months of age, from September to December 2018 (postintervention), compared to the preintervention period (January to June 2018).

Additionally, the results were compared to one community that did not receive the intervention (Middle Rio Purus SIHD). The data regarding lactation consultations of indigenous infants up to 12 months of age were obtained from records of the SUS in the Special Indigenous Health Districts (SIHDs – DSEI in Portuguese) in the state of Amazonas, Brazil.

Intervention

An experimental study (2017-2019) was developed in five phases in which permanent educational activities were carried out with primary health care professionals and indigenous traditional midwives in indigenous areas of the state of Amazonas, where there are telehealth points. The specific study objectives were to contribute to achieving nutritional balance in the indigenous population from 0 to 5 years old based on nutritional guidance with emphasis on the family nucleus.

In the first phase, two researchers (PI and Nutritionist) carried out field visits in the Upper Rio Solimões and Upper Rio Negro SIHDs for seven days in 2018. They used the participative approach and collected testimonies of health professionals, alternating individual deep nonstructured interviews with group interviews at different health facilities. Guided by local health professionals, they also visited river ports, fairs that sell crafts and subsistence agriculture products in two Brazilian cities (Tabatinga and São Gabriel da Cachoeira). All testimonies, places visited, and researcher observations were registered in a personal field diary. Then, the team performed a content analysis of the collected data.

The field visits and the scoping review (phases 1, 2) confirmed that the indigenous peoples had access to the Internet and smartphones, the health teams rarely used the state telehealth network, the prenatal care was precarious, and exclusive breastfeeding was reduced and strongly influenced by the subsistence of women and their family (Silva 2019). We considered these results in constructing the list of subjects to be addressed when working with the local health professionals during the telehealth sessions. (Figure 1)

Figure 1 Timeline of the five phases of Sig Tel@ Amazonia study



Source: The Authors

Note. ^a Special Indigenous Health District Upper Rio Negro, CASAI de São Gabriel da Cachoeira, AM, field visit, April 2018. ^b Semantic Map of the Scoping Review (Silva et al., 2019). ^c Advertising material for the training ^d Registration screen of the Information System – SIASI. ^e Traditional midwives and health professionals at the workshop about nutrition for children and pregnant woman, Tabatinga, AM, 2019.

Phase 3 of the intervention consisted of training primary care and childcare teams through interactive lectures on the internet for all SIHDs in Amazonas that have telehealth centers. Two training courses were held on breastfeeding and the introduction of solid foods to the infant's diet, with in-person procedures and interactions facilitated through telehealth activities in the SUS in July and August 2018, respectively.

The assessment was phase 4 of the Tel@ Amazonia research study. The data from the phase 4 assessment came from the Brazilian Health Information System for Indigenous Peoples (SIASI) database of care and counseling for breastfeeding in Amazonian indigenous communities.

Finally, the fifth and final phase of the project was a workshop in the two SIHD headquarters. Traditional midwives and health professionals met to record millennial recipes for pregnant women, mothers who have recently given birth and infants in the phase of solid food introduction. These recipes are available on the internet (Freitas P 2019).

The Health Information System for Indigenous Peoples - SIASI

In 2002, the National Policy for the Attention to Health of Indigenous Peoples (PNASPI), which integrated the Subsystem for Indigenous Health into the National Health Policy to Ministry of Health (MoH), was launched. The Special Secretariat for Indigenous Health (SESAI) is the area of the Ministry of Health (MoH) responsible for

coordinating PNASPI and the management process of the Indigenous Health Care Subsystem (SasiSUS), within the scope of the Unified Health System (SUS) in the national territory (Brasil 2019).

The mission of SasiSUS is to exercise indigenous health management to protect, promote and restore the health of indigenous peoples. Part of this mission is to guide the development of actions of integral attention to indigenous health and health education according to the peculiarities, epidemiological profile, and health condition of each SIHD.

Since 2002, the federal government has sought to implement a decentralized model of management and care in the Indigenous Health Subsystem with administrative, budgetary, financial and health responsibilities assigned to the SIHDs, including the control and participation of indigenous people who participate in councils (Garnelo 2014).

The health professionals of the SIHDs feed the SIASI, and it has eight modules. The data collection instruments, lack of interface with other national health information systems, difficulty accessing to the data, and no utilization of the data to plan subsequent health activities are the main limitations of the system (Souza et al. 2007). The food and nutrition surveillance module to assist SIASI's mother-infant dyad has 23 variables. This module offers a specific monthly breastfeeding follow-up report in which the number of infants who are exclusively breastfed, do not receive breast milk or receive complementary feeding, segmented by age and territory, are recoded. There is also information on the type of visit: lactation consultation, which can be carried out collectively, outpatient consultation or home visit.

Setting

The Brazilian territory is divided in 34 SIHDs. In 2016, they provided direct assistance to approximately 738,624 indigenous people who constituted more than 170 thousand families living in 5,361 villages, according to data from the SIASI. These indigenous individuals belong to 305 peoples who speak 274 different languages, and each population has their own traditions, customs, religions and modes of social organization within an indigenous territorial extension of 1,135,182.35 km² (Brasil 2016).

The state of Amazonas is home to 55% of the country's indigenous population. It is split into six SIHDs: Upper Rio Negro, Upper Rio Solimões, Manaus, Middle Purus River, Middle Solimões with Tributaries, and Parintins.

Data collection

We collected the data from the MoH SIASI, in which the individual participants are anonymized. The analysis used the following variables related to the moment of care/consultations: age of child (in months), month of attendance, exclusive breastfeeding and SIHD.

Professionals and indigenous female leaders who participated in the group activities signed a free and informed consent form. The National Research Ethics Commission (CONEP) approved this research (number 2,942,692).

Data analysis

The effectiveness of the intervention was assessed based on the increase in the average monthly number of consultations for children up to 12 months of age and younger than one year and the proportion of exclusive breastfeeding by age (in months) in the periods before and after the intervention in each SIHD.

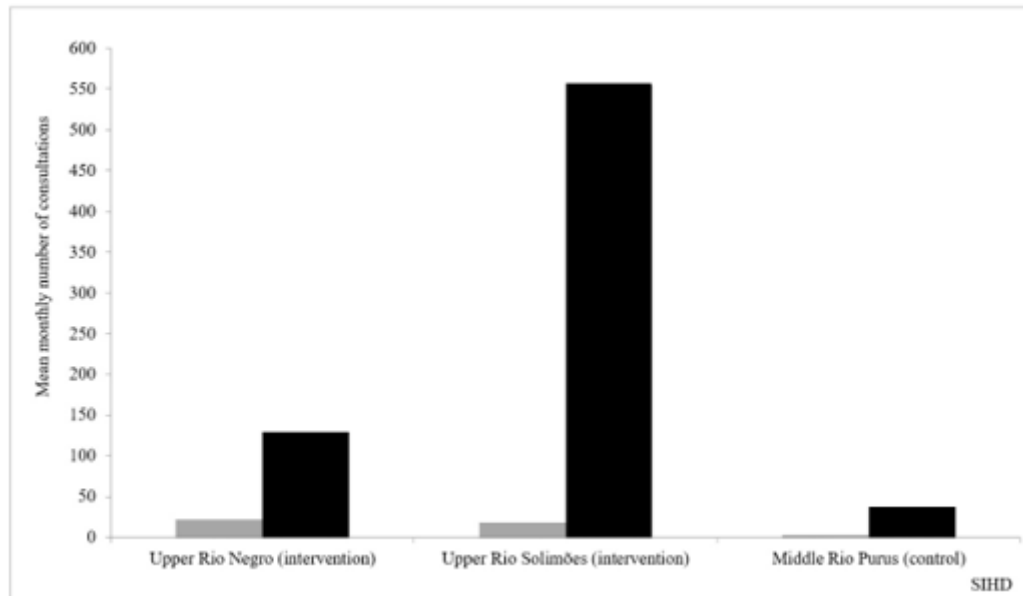
The mean monthly number of consultations for children up to 12 months of age was calculated in each period (pre- and postintervention) and SIHD by dividing the total number of consultations by the number of months. Then, the increased mean monthly number of consultations was calculated from the decrease in the mean number of consultations in the postintervention period from the preintervention period, divided by the mean number of consultations in the preintervention period and multiplied by 100.

Pearson's chi-square test was used to verify the existence of statistically significant differences between the proportions ($p \leq 0.05$) by age group (<1 month, 1 to 3 months, 4 to 6 months, and 7 to 12 months), adjusted by Yate's continuity correction when necessary. The data were analyzed in R software, version 3.6.1.

3 RESULTS

In the SIHDs in which the health teams participated in the training, there was a major increase in lactation consultations after the intervention. The mean monthly consultations in the Upper Rio Solimões increased from 18 to 450, an increase of 2,398%, and mean monthly consultations in the Upper Rio Negro increased from 22 to 113 (423%). There was also an increase in consultations for breastfeeding in the Middle Rio Purus, but this increase was smaller (294%). (Figure 3)

Figure 3 Mean monthly number of consultations for infants pre- and postintervention, according to the SIHDs, 2018 In light gray, the Preintervention (January to June 2018) and in dark gray, Postintervention (September to December 2018)



Source: The Authors

There was no statistically significant difference in the exclusive breastfeeding proportion in infants up to six months of age after the intervention ($p \geq 0.499$) in the communities covered by the Upper Rio Negro (Table 1) and the Upper Rio Solimões SIHDs (Table 2). For infants over six months of age, there was a reduction in the exclusive breastfeeding proportion (from 10.0% to 3.2%) in the Upper Rio Solimões SIHD only ($p = 0.043$).

Table 1 – Comparison of the Exclusive Breastfeeding Proportion Before and After the Intervention according to Infant Age in Months in The Upper Rio Negro Special Indigenous Health District in 2018

Age in months	Preintervention (January-June)				Postintervention (September- December)				p*
	Total		Exclusive breastfeeding		Total		Exclusive breastfeeding		
	N	%	N	%	N	%	N	%	
< 1	19	14.6	19	100.0	50	9.7	46	92.0	0.980
1	12	9.2	12	100.0	35	6.8	30	85.7	-
2	6	4.6	5	83.3	29	5.6	26	89.7	-
3	11	8.5	10	90.9	45	8.7	39	86.7	-
1 to 3	29	22.3	27	93.1	109	21.0	95	87.2	0.946
4	6	4.6	5	83.3	35	6.8	24	68.6	-
5	9	6.9	6	66.7	32	6.2	22	68.8	-
6	12	9.2	10	83.3	45	8.7	20	44.4	-
4 to 6	27	20.8	21	77.8	112	21.6	66	58.9	0.499
7	9	6.9	4	44.4	46	8.9	18	39.1	-
8	12	9.2	3	25.0	34	6.6	10	29.4	-
9	5	3.8	2	40.0	39	7.5	10	25.6	-
10	8	6.2	3	37.5	41	7.9	6	14.6	-

11	9	6.9	0	0.0	37	7.1	4	10.8	-
12	12	9.2	1	8.3	50	9.7	3	6.0	-
7 to 12	55	42.3	13	23.6	247	47.7	51	20.6	0.829
Total	130	100.0	80	-	518	100.0	258	-	-

*Pearson's chi-squared test with Yates' continuity correction.

Table 2 – Comparison of the Exclusive Breastfeeding Proportion Before and After the Intervention according to Infant Age In Months in The Upper Rio Solimões Special Indigenous Health Districts in 2018

Age in months	Preintervention (January-June)				Postintervention (September-December)				p*
	Total		Exclusive breastfeeding		Total		Exclusive breastfeeding		
	N	%	N	%	N	%	N	%	
< 1	9	8.3	9	100.0	197	8.8	194	98.5	1.000
1	8	7.4	7	87.5	158	7.1	150	94.9	-
2	8	7.4	8	100.0	163	7.3	149	91.4	-
3	6	5.6	5	83.3	179	8.0	162	90.5	-
1 to 3	22	20.4	20	90.9	500	22.4	461	92.2	1.000
4	7	6.5	6	85.7	164	7.4	140	85.4	-
5	8	7.4	6	75.0	127	5.7	75	59.1	-
6	12	11.1	6	50.0	174	7.8	62	35.6	-
4 to 6	27	25.0	18	66.7	465	20.9	277	59.6	0.841
7	7	6.5	2	28.6	158	7.1	9	5.7	-
8	11	10.2	1	9.1	189	8.5	7	3.7	-
9	6	5.6	0	0.0	159	7.1	5	3.1	-
10	9	8.3	1	11.1	190	8.5	4	2.1	-
11	8	7.4	1	12.5	168	7.5	3	1.8	-
12	9	8.3	0	0.0	202	9.1	6	3.0	-
7 to 12	50	46.3	5	10.0	1066	47.8	34	3.2	0.043
Total	108	100.0	52	-	2228	100.0	966	-	-

*Pearson's chi-squared test with Yates' continuity correction.

There was also no statistically significant difference in the exclusive breastfeeding proportion in infants up to six months ($p \geq 0.209$) between the SIHDs with the intervention (Upper Rio Negro and Upper Rio Solimões) and the SIHD without the intervention (Middle Rio Purus) (Table 3). It was not possible to analyze infants over six months of age, since only one case was recorded in the community selected without intervention.

Table 3 - Comparison of the Exclusive Breastfeeding Proportion between Special Indigenous Health Districts (SIHDs) With and Without Intervention, September-December 2018

Age in months	SIHDs With intervention			SIHD Without intervention			p*
	Total	Exclusive Breastfeeding		Total	Exclusive Breastfeeding		
		N	%		N	%	
< 1	247	240	97.2	16	16	100.0	1.000
1	193	180	93.3	11	10	90.9	-
2	192	175	91.1	10	10	100.0	-
3	224	201	89.7	9	8	88.9	-
1 to 3	609	556	91.3	30	28	93.3	1.000
4	199	164	82.4	13	11	84.6	-
5	159	97	61.0	17	5	29.4	-
6	219	82	37.4	13	1	7.7	-
4 to 6	577	343	59.4	43	17	39.5	0.209

*Pearson's chi-squared test with Yates' continuity correction.

4 DISCUSSION

In the analysis of the records of indigenous postpartum women from the SIASI, tenuous evidence was obtained to support the common belief that exclusive breastfeeding is a traditional practice among different indigenous groups; even so, there are few studies on breastfeeding in indigenous peoples (Alves et al. 2013; Pedraza et al. 2014).

This study identified a significant increase in the number of breastfeeding-related consultations for babies under one year old after the intervention, highlighting the importance of training for the improvement of the information system, which is essential for planning actions in communities. It was demonstrated that breastfeeding extends beyond six months of age, which can be a factor contributing to the high degree of child malnutrition in the population (Borges et al. 2016) in territories where there is inadequate monitoring of the introduction of solid foods into a child's diet. Pantoja et al. (2014) report that the nutritional deficits found in their research were the worst described to date in the Brazilian literature on indigenous populations, pointing to a situation of chronic malnutrition that requires urgent attention.

The participatory focus of the project's awareness-raising workshop guaranteed the health teams' active involvement. According to the participants, the Ministry of Health promotes special training activities on the importance of counseling young indigenous women (Schweickardt et al. 2019). However, the results show some uncertainty that this service is happening in the indigenous communities served by these SIHDs.

According to Farfán et al. (2019) and Marinho, Borges, Paz e Santos (2019), the precarious sanitation among these peoples is driven by predatory deforestation, forest fires, mining, poor quality of the water and the inadequate disposal of waste. This precarious sanitation has been an important cause of infant mortality, due to diarrhea, infections and parasitic diseases, among the indigenous peoples studied here (Escobar et al., 2015), which is ironic since their traditional lands are located in the largest freshwater basin in the world.

The territory studied here includes cities where the indigenous population receives government aid and purchases food in their community markets. Nutritional studies and recent research (Jacobs and Richtel 2017; Ellis-Petersen 2018; Corrêa et al. 2020; Souza and Villar 2020) have demonstrated the indiscriminate penetration of ultra-processed foods in indigenous populations worldwide. Indigenous women symbolically equate the consumption of these food products (for example, sodas and powdered milk) with entry into "the white man's world" and escape from extreme poverty (Machado 2017).

Healthcare and counseling on breastfeeding provided to indigenous populations by the SUS are not limited to cities. The public health structure reaches remote communities through multidisciplinary indigenous health teams (EMSI), which periodically visit indigenous villages and groups. The EMSI team consists of nurses, nutritionists, and technicians from these areas. Caring for and counseling indigenous mothers on breastfeeding requires a multidisciplinary approach that has been written into the national policy on the topic (Brasil 2017). A particular aspect of the public health strategy is to preserve the rights of the indigenous peoples inhabiting the forests (UN General Assembly 2017), which should be observed when introducing oral rehydration therapy. This measure saves the lives of infants in areas without adequate sanitation. Nevertheless, it can also cause the indiscriminate introduction of industrialized salt and sugar into the diets of people who are unfamiliar with these ingredients (Victora et al. 2016).

UNICEF (Blesh et al. 2019) clearly emphasizes the Sustainable Development Goal of Zero Hunger. This goal recommends exclusive breastfeeding for the first six months of life since it prevents hunger, malnutrition, and obesity by guaranteeing delivery of all the nutrients and calories necessary for infant growth and development. After six months of age, the PAHO (2017) and WHO recommend that children should continue to be breastfed (with the addition of other foods) for up to two years or more.

Limitations

One of the limitations of this study is the short follow-up period after the evaluated intervention, considering that changes in the behavior of health service professionals and the population require a longer period of evaluation and continuous monitoring.

In addition, the SIASI contains few variables, which makes it difficult to understand breastfeeding and other characteristics of the participants.

5 CONCLUSION

The study did not identify evidence of early weaning but observed an extension of exclusive breastfeeding beyond the WHO recommendation. However, the intervention, which involved the participation of indigenous female leaders, contributed to a greater adhesion to exclusive breastfeeding and dietary guidelines among women in these communities. Breastfeeding in indigenous peoples presents challenges that require specific public health interventions, such as a permanent education program that provide information on the best and most recent evidence to support breastfeeding, which includes the periodic education of health teams. Although the intervention was time-limited, there is an expectation of improvement in breastfeeding in the region, including greater involvement of leaders and health professionals. This experience can support future interventions aiming to guarantee the food and nutritional security of indigenous children in the first year of life.

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