

Food and nutrition education for mothers of infants: post intervention evaluation**Educação alimentar e nutricional para mães de lactentes: avaliação pós intervenção****Educación alimentaria y nutricional para madres de lactantes: evaluación posterior a la intervención**

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Objective: to describe and compare the knowledge of parents about the introduction of complementary foods, before and after participating in lectures and culinary workshops on the subject. **Methods:** cross-sectional study, carried out between 2018 and 2019, with the participation of mothers and a father, divided into two groups. For data collection, two questionnaires were used, analyzed using descriptive statistics before and after the intervention. **Results:** 41 parents from the first group participated, of which 37 increased from one to five points before and after the intervention, and four maintained the same score in both assessments. Of the 31 mothers in the second group, from pre to post-test, 26 increased from one to six points, two had lower scores in the second application, three maintained the same score, and one got all the questions right in the pre and post-test. **Conclusion:** the post-intervention evaluation showed an increase in knowledge about introducing babies to food.

Descriptors: Food and nutrition education; Infant nutrition; Infant nutritional physiological phenomena.

Objetivo: descrever e comparar o conhecimento de pais sobre a introdução da alimentação complementar, antes e depois de participarem de palestras e oficinas culinárias sobre o tema. **Método:** estudo transversal, realizado entre 2018 a 2019, com a participação de mães e um pai, divididos em dois grupos. Para a coleta de dados foram utilizados dois questionários, analisados pela estatística descritiva antes e depois da intervenção. **Resultados:** participaram 41 pais do primeiro grupo, das quais 37 aumentaram de um a cinco pontos de antes e depois da intervenção, e quatro mantiveram a mesma pontuação nas duas avaliações. Das 31 mães do segundo grupo, do pré para o pós-teste, 26 aumentaram de um a seis pontos, duas tiveram escores menores na segunda aplicação, três mantiveram a mesma pontuação e uma acertou todas as questões no pré e no pós-teste. **Conclusão:** a avaliação pós-intervenção mostrou elevação de conhecimentos acerca da introdução alimentar dos bebês

Descritores: Educação alimentar e nutricional; Nutrição do lactente; Fenômenos fisiológicos da nutrição do lactente.

Objetivo: describir y comparar los conocimientos de los padres sobre la introducción de la alimentación complementaria, antes y después de participar en conferencias y talleres culinarios sobre el tema. **Método:** estudio transversal, realizado entre 2018 y 2019, con la participación de madres y un padre, divididos en dos grupos. Se utilizaron dos cuestionarios para la recogida de datos, analizados mediante estadística descriptiva antes y después de la intervención. **Resultados:** 41 padres participaron en el primer grupo, de los cuales 37 aumentaron de uno a cinco puntos entre antes y después de la intervención, y cuatro mantuvieron la misma puntuación en ambas evaluaciones. De las 31 madres del segundo grupo, de la preprueba a la posprueba, 26 aumentaron de uno a seis puntos, dos obtuvieron puntuaciones menores en la segunda aplicación, tres mantuvieron la misma puntuación y una acertó todas las preguntas de la preprueba y posprueba. **Conclusión:** la evaluación posterior a la intervención mostró un aumento de los conocimientos sobre la introducción alimentaria a los bebés.

Descriptor: Educación alimentaria y nutricional; Nutrición del lactante; Fenómenos fisiológicos nutricionales del lactante.

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INTRODUCTION

Breast milk is ideal for babies. It is superior to other milks, with nutritional advantages, providing adequate and healthy growth. It reduces infant mortality, acts on the immune system, protects against infections and other diseases¹⁻². It is recommended that the child be breastfed in the first hour of life, exclusively until six months and during the first two years of life, so that offering other foods before six months increases the risk of the child becoming ill, interfering with the absorption of nutrients present in breast milk¹.

At six months, it is recommended to offer allergenic foods, such as eggs. This is when the immune system is ready to receive new foods, developing immune tolerance. Late exposure may be related to a greater risk of developing allergies. If there is a family history of allergy, it is recommended that these foods be introduced gradually³.

The Ministry of Health⁴ elaborated the food guide for children under 2 years old. It includes guidance on breastfeeding and complementary feeding. In 2019, a new guide was offered with the aim of supporting families and subsidizing professionals working in primary care to guide mothers and caregivers regarding the feeding of Brazilian children¹. Despite the available information, infant feeding is far from ideal⁵. Those responsible for introducing food to children are parents and caregivers⁶, so it is important that they are equipped with adequate information⁷.

Studies have identified that family members of babies have doubts and inadequate knowledge about breastfeeding and food introduction⁸⁻⁹. Among them are the correct time for introducing complementary foods, as well as the proper way to offer them. An instrument was validated to identify areas that need greater investment, so that parents are able to make more appropriate decisions regarding their children's diet¹⁰.

It was identified that the prevalence of inadequate nutrition was more significant in the population younger than one year¹¹. Among the foods most consumed by the population were: powder and liquid cow's milk, porridge, soft drinks, stuffed biscuits and snacks. In view of this, the action of nutritionists is essential to adequately guide parents and other caregivers about the child's diet.

Educational interventions aimed at parents, both during breastfeeding and complementary feeding, must be focused against conventional beliefs and practices⁷. Programs have been conducted with education professionals and parents of babies younger than two years old on breastfeeding and complementary feeding, with positive effects¹².

Feeding in childhood is a complex process that is influenced by several factors, including cultural and socioeconomic factors¹³. The formation of children's eating habits is related to

parents and caregivers, who are primarily responsible for choosing, preparing and presenting food to children¹⁴⁻¹⁵. Informing them about food introduction can ensure safe and adequate food for their children. This study aimed to describe and compare the knowledge of parents about the introduction of complementary foods, before and after participating in lectures and culinary workshops on the subject.

METHODS

This is a cross-sectional study, funded by the Brazilian Ministry of Health, through the National Support Program for Health Care for Persons with Disabilities (PRONAS/PCD).

Parents participated, divided into two groups (Group 1 - G1 and Group 2 - G2), collected from April 2018 to November 2019.

Data were collected using two questionnaires: the Food Introduction Questionnaire 1 and the Food Introduction Questionnaire 2. The first version of the questionnaire was adapted from the Infant Feeding Questionnaire prepared by Nunes, Duarte and Pereira (2012), which has not yet been validated. The first version consisted of nine closed questions. From the application to G1, the questions were reformulated, considering the questioning and comprehension difficulties. The second version of the instrument had 10 questions. Changes and justifications for each question are described in Table 1.

Table 1. Questionnaire items and changes made from the first to the second version. Bauru, 2019.

Food Introduction Questionnaire 1	Food Introduction Questionnaire 2	Justifications for the changes made
1. At how many months should we start offering baby food?	1. At how many months can the baby receive foods other than milk?	Facilitate understanding.
2. Should we only consider age to start eating? () Yes () No	2. What is important to observe for the baby to start feeding? () Age () Head control () Sitting with little support () All alternatives are correct	Detail the answers, in order to make the parents and guardians think about it.
3. What foods should I offer? () Meat and eggs, rice, potatoes, cassava, cornmeal, beans, lentils, peas, chickpeas, vegetables, fruits and vegetables () Cornstarch biscuits, flour biscuits, yogurts, vegetables and fruits () Only potatoes, cassava and cornmeal () Only meat, eggs and vegetables () Only vegetables	3. What foods should I offer? () Only vegetables () Only fruits () Fruits, vegetables, greens, meat, rice and beans.	Reduce the number of items in each response, in order not to confuse parents and optimize time.
	4. About the egg offer. Mark the correct alternative.	Question included due to the demand that arose on the

	<input type="checkbox"/> I can offer from the beginning (whole egg, white and yolk) <input type="checkbox"/> I can offer from the beginning, as long as it's just the whites <input type="checkbox"/> I need to wait for the baby to be 9 months old	supply of allergens during the lectures/workshops.
4. How do I have to offer these foods? <input type="checkbox"/> Mashed <input type="checkbox"/> Processed/liquefied <input type="checkbox"/> Sieved	5. How should I offer these foods? <input type="checkbox"/> Mashed with a fork <input type="checkbox"/> Processed in a blender <input type="checkbox"/> Passed through a sieve	Facilitate understanding.
5. What is the ideal way to prepare baby food? <input type="checkbox"/> With natural seasonings and with added salt and sugar <input type="checkbox"/> With added salt, sugar and industrialized spices <input type="checkbox"/> With natural seasonings and without added salt and sugar <input type="checkbox"/> With natural seasonings and with added salt, but without added sugar <input type="checkbox"/> With natural seasonings and with added sugar, but without added salt	6. What is the ideal way to season baby food? <input type="checkbox"/> With garlic, onion, parsley (natural seasonings) <input type="checkbox"/> Only salt <input type="checkbox"/> With salt, garlic, onion and parsley	Reduce the number of items in each response, in order not to confuse parents and optimize time.
6. What is the ideal position to offer baby food? <input type="checkbox"/> Lying on the crib/floor/bassinet <input type="checkbox"/> Seated <input type="checkbox"/> Slightly tilted <input type="checkbox"/> Lying on the lap	7. What is the ideal position to offer baby food? <input type="checkbox"/> Lying down <input type="checkbox"/> Seated	Reduce the number of items in each response, in order not to confuse parents and optimize time.
7. For babies who are breastfed, is it necessary to offer water after introducing food? <input type="checkbox"/> Yes <input type="checkbox"/> No	8. Do babies who are only breastfeeding need to drink water after introducing food? <input type="checkbox"/> Yes <input type="checkbox"/> No	Facilitate understanding.
8. Should the baby sit at the table when the family is having a meal or should they have their own time so that they can feed themselves? <input type="checkbox"/> Yes <input type="checkbox"/> No	9. The baby must be fed: <input type="checkbox"/> Separated from the family at their own time <input type="checkbox"/> Together with the family at meal times	Facilitate understanding.
9. Does the type of spoon interfere with food supply? <input type="checkbox"/> Yes <input type="checkbox"/> No	10. What is the most suitable spoon to feed the baby? <input type="checkbox"/> Crooked aluminum spoon <input type="checkbox"/> Straight silicone or plastic spoon <input type="checkbox"/> Crooked plastic spoon <input type="checkbox"/> Straight aluminum spoon	Detail the answers, in order to make the parents and guardians think about it.

Activities were carried out, including lectures and workshops, with the application of questionnaires before and after them. For lectures and workshops were used: multimedia projector; various foods (cornmeal, beans, fruits, vegetables, greens, meat) and kitchen utensils such as stove, blender, multiprocessor, juicer, pans, spoons, forks and knives.

Data were collected and lectures were held in the cafeteria of the institution whose purpose is the rehabilitation of people with disabilities. And, the workshops were held in the ADL (Activity of Daily Living) room, which has a complete kitchen (stove, microwave, refrigerator, sink, various utensils, cupboards, a large table and chairs).

Data collection was performed when the child was six months old on average. Parents were invited by phone call or in person, at which time the purpose of the activities was explained.

After completing the ethical formalities, providing clarifications and signing the Free and Informed Consent Form, the participants answered the Questionnaire on Food Introduction 1 or 2, depending on the collection period. At the end, the participants were invited to answer again the same questionnaire applied before the intervention.

The lectures lasted approximately one hour, addressing the following topics related to food introduction: age for introducing food, signs of readiness (body and neck control, sitting without support, sensory system, chewing and swallowing), types of food that should be compose the food, frequency with which they should be offered, ideal consistency for each phase, mode of supply, hydration, foods that should not be offered, allergenic foods, incentive to share meals with the family, participatory food introduction, type of spoon for offering of food and promotion of healthy eating.

The culinary workshops, with a duration similar to the lectures, aimed to train parents and caregivers in relation to how to prepare and offer food to babies. Some recipes were made with the foods mentioned above. These were offered mashed. Some in soft pieces for babies to hold on their own. At the time of offering, parents and caregivers were also trained regarding the safe position for offering food, as well as the correct use of the spoon.

For data analysis, each correct question of each of the questionnaires was assigned one point. The data were transformed into means and standard deviation for each question and the t test was applied, for paired groups, considering the size of the samples.

This work was approved by the Ethics Committee of the Universidade Estadual Paulista Júlio de Mesquita Filho, Bauru *campus*. Before starting the collection, all ethical precautions were taken, such as informing the parents about the project stages, the absence of onus on their part, the possibility of withdrawing the authorization for the use of data at any time of the collection and the impossibility of identification of data since they will always be analyzed in groups, on the occasion of publications or presentation at conferences in the area.

RESULTS

Group 1 (G1) consisted of 40 mothers and one father, with 43 babies, and Group 2 (G2), with 31 mothers, with 34 babies. Babies in G1 were mostly girls (51%) and in G2 were mostly boys (59%), aged between five and nine months, who were born between 34 and 36 gestational

weeks (G1=60%; G2=50%), babies in G1 weighed more than 2000g (60%) and those in G2 weighed less than 2000g (53%).

Mothers in both groups were between 14 and 32 years old, with most of them over 26 years old. As for education, mothers with up to High School education prevailed in G1 and, in G2, with High School education or more. Most, in both groups, were married (G1=87% and G2=93%) and did not work outside the home.

23 activities were offered with an average of four participants in each.

Considering the modifications that were made in the “Food Introduction Questionnaire 1” that resulted in the “Food Introduction Questionnaire 2”, the data for each of the groups will be presented separately.

For the group of participants who answered the “Food Introduction Questionnaire 1”, comparing the answers given in the two evaluations, before and after participating in the lectures and workshops, it was observed that of the nine questions, in seven of them the averages were higher in the post test, one remained and the other had a small decrease.

However, in both cases the averages in the pre and post-test were greater than 0.8 out of a total of 1.0 points. Of the questions, four (Questions 3, 5, 7 and 8) has significant differences, with an increase in the mean from pre to post-test, as well as for the total score. Of these, two (Questions 3 and 7) had moderate effect and one (Question 8) had a big effect (Table 2).

Table 2. Results obtained by Group 1 in the pre-test and post-test of the “Food Introduction Questionnaire 1”. Bauru, 2019.

Questions	Pre-test		Post-test		P	D
	Mean	SD	Mean	SD		
At how many months should we start offering baby food?	0.82	0.38	0.95	0.21	0.058	0.305
Should we take into account only age to start eating?	0.63	0.48	0.70	0.46	0.183	0.212
What foods should I offer?	0.41	0.49	0.80	0.40	0.000	0.790
How do I have to offer these foods?	0.82	0.38	0.95	0.21	0.058	0.305
What is the ideal way to prepare baby food?	0.65	0.48	0.80	0.40	0.032	0.347
What is the ideal position to offer baby food?	0.95	0.21	0.95	0.21	1	000
For babies who are breastfed, after the introduction of food is it necessary to offer water?	0.63	0.48	0.92	0.26	0.000	0.635
Should the baby sit at the table when the family is having a meal, or should they have their own time so that they can feed themselves?	0.26	0.44	0.73	0.44	0.000	0.918
Does the type of spoon interfere with the supply of food?	0.82	0.38	0.80	0.40	0.710	0.058
Total	6.04	1.53	7.63	1.77	0.000	1.27

Table 3 shows the average performance of the group that answered the “Food Introduction Questionnaire 2”, in the pre and post-test, highlighting the questions whose changes were significant. For the group of 31 participants who answered the “Food Introduction Questionnaire 1”, comparing the answers given in the two evaluations, before and after participating in the lectures and workshops, it was observed that of the nine questions, in all of them the averages were higher in the post test. Of the questions, five (Questions 4, 5, 6, 9 and 10) had significant differences, with an increase in the mean from pre to post-test, as well as for the total score. Of these, two (Questions 6 and 9) had a moderate effect and one (Question 4) had a big effect (Table 3).

Table 3. Results obtained by Group 2 in the pre and post-test of the “Food Introduction Questionnaire 2”. Bauru, 2019.

Questions	Pre-test		Post-test		P	D Cohen
	Mean	SD	Mean	SD		
At how many months can the baby receive foods other than milk?	0.58	0.50	0.80	0.40	0.070	338
What is important to observe for the baby to start feeding?	0.48	0.50	0.67	0.47	0.110	296
What foods should I offer?	0.77	0.42	1	0.44	0.070	338
About the egg offer. Mark the correct alternative.	0.32	0.47	0.80	0.40	0.000	849
How should I offer these foods?	0.77	0.45	0.96	0.17	0.012	482
What is the ideal way to season baby food?	0.61	0.49	0.96	0.17	0.000	730
What is the ideal position to offer baby food?	0.96	0.17	1	0.17	0.325	180
Do babies who are only breastfeeding need to drink water after introducing food?	0.54	0.50	0.67	0.47	0.325	180
Where the baby must be fed	0.54	0.50	0.90	0.50	0.001	644
What is the most suitable spoon to feed the baby?	0.67	0.47	0.93	0.47	0.018	448
Total	6.29	1.44	8.74	1.31	0.000	1.31

DISCUSSION

Most of the questions for both Questionnaire 1 and Questionnaire 2 had a higher percentage of correct answers in the post-test, which shows us the positive effect of lectures and culinary workshops, with the exception of question 9, which refers to the type of spoon that food should be offered, but whose result, since the pre-test, was already close to the limit (1 point). This data can be justified by the fact that the utensils used in food have a supporting role in food introduction.

There was a lack of research on the most appropriate type of spoon and the correct way it should be used. A study¹⁶ pointed out that food should be offered to babies on a spoon only. The food guide for children under two years of age recommends that the size of the spoon be compatible with the size of the child's mouth¹. However, the correct use of these items is considered important for a better development of the orofacial muscles of babies¹⁷.

It was observed that questions 3, 5, 7 and 8 had a significant increase in the number of correct answers in the post-test. Question 3 refers to which foods should be offered to the baby. This lack of knowledge on the part of parents results in the wrong offer of food, corroborating the results of a similar investigation⁸. The caregiver must be involved in the act, making eye contact with the child, offering healthy foods in an appropriate way, to allow the child to be able to distinguish the different flavors and textures⁶.

Question 5 refers to the seasoning used in baby food. Aware that the seasoning of food is influenced by the culture of a community, feeding babies requires special care. Salt should not be added when preparing food for infants¹⁸, if administered it should be in a minimum amount³. As a substitute, natural seasonings such as garlic, onion, pepper, parsley, chives, oregano, basil, nutmeg, paprika, bay leaf, thyme and others can be used³.

Considering that eating habits are formed in childhood¹⁹, it is prudent that some foods are not offered to children¹⁸, in addition to interfering with their appetite and competing with healthy foods, they are related to the occurrence of anemia, overweight, obesity and food allergies¹⁸. However, the findings in the present study differ from those found in a similar work⁸, in which the parents demonstrated a good knowledge regarding the seasonings that should and should not be used in children's food.

Another point unknown by the parents of this research was the supply of water. In the first six months and with exclusive breastfeeding there is no need to offer water. However, after six months, as soon as the introduction of other foods begins, the Brazilian Ministry of Health³ and the Brazilian Society of Pediatrics²⁰ advise the offer of water, since these new foods present, in their composition, a greater amount of proteins and mineral salts that cause an overload of solutes for the kidneys, which must be compensated by the greater supply of water.

Question 8 refers to the fact that the baby sits at the table to eat with the parents. The Food Guide for Brazilian Children under 2 years of age¹ recommends shared meals in the family environment, emphasizing the importance of the child sitting at the table or even being close to the family at meal times. One study²¹ found a beneficial effect on the nutritional status and eating behavior of children and adolescents who have daily family meals.

Eating with the family until reaching one year of age is a challenge, especially when sharing the same menu with the child⁶. The family meal is a habit that is becoming rare worldwide, in addition to the increase in the frequency with which children and adults eat while watching television or handling electronic devices⁶.

As for Questionnaire 2, a higher general average of correct answers was observed in the post-test (8.74), when compared to the general average of Questionnaire 1 (7.63). This is data that suggests that the changes in the questions may have also facilitated the understanding of the items.

Analyzing the data from Questionnaire 2, it was observed that questions 4, 5, 6, 9 and 10 had a significant increase in the number of correct answers in the post-test. In this, the question that had the highest number of errors in the pre-test was question 2, which refers to offering eggs. It is recommended as early as six months, in order to avoid the subsequent appearance of allergies, a time when the immune system is ready to receive new foods and the body is conducive to developing immunological tolerance³. This data shows that parents and caregivers still have inadequate information regarding complementary feeding for their children. Similar to this, in a survey carried out in Spain, it was possible to verify that parents were waiting on the introduction of fish and eggs. Thus, the importance of clear and specific guidance to parents, about the introduction of these foods²².

The findings of the present study reinforce that educational activities increase knowledge and/or modify the concepts of mothers or caregivers about complementary feeding, suggesting that these actions should be systematically offered to them^{23,24}. It is understood, therefore, the importance of programs that act in an active, playful and interactive way, thus favoring changes in attitudes and eating practices²⁵

CONCLUSION

The data obtained point to the positive effect of the activities offered to improve the introduction of food to babies after six months of age.

Among the limitations of the study are the low number of participants and the modification of the questionnaire. However, without invalidating the data obtained with the first, the second questionnaire proved to be more suitable for this type of collection that can subsidize, in future studies, the elaboration of specific interventions for the parents of babies, focusing on mistaken beliefs or lack of knowledge about adequate supply of food or its preparation.

Another suggestion is, in addition to immediately assessing the effect of the intervention, predicting follow-up, a month or two later, to observe whether the knowledge is still maintained and whether it has been incorporated into the infants' feeding practices.

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Loana Karina Benedito Pereira participated in the design, data collection and analysis, writing and revision. **Daila Priscila Mendes Romualdo** contributed to data collection and analysis, writing and revision. **Janaina Senhorini dos Santos** collaborated in data collection and analysis and revision. **Olga Maria Piazzentin Rolim Rodrigues** worked on the design, data analysis and revision.

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