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Maternal reasons for offering ultra-processed foods to infants under one year old: CLaB study results

Razões maternas para oferta de alimentos ultraprocessados a lactentes menores de um ano: resultados do estudo CLaB

Abstract

Introduction: the reasons for introducing ultra-processed foods into infants' diets are not well known. *Objective:* to investigate mothers' reasons for introducing ultra-processed foods into their children's diets during the first year of life. *Methods:* data from a quantitative prospective cohort study, the CLaB study, with 656 mother/child pairs in Botucatu, São Paulo. A questionnaire was administered at seven points during the first year of life, assessing the introduction (yes, no) of 10 ultra-processed foods into the infant's diet: chocolate drink, soft drink, industrialized juice, powdered juice mix, cheese *petit suisse*, processed meats, filled cookies, packet snacks, instant noodles, and ice cream. When the first "yes" answer was given for each food, the reason for this practice was questioned. Maternal responses were grouped according to their nature or meaning. *Result*: it was possible to obtain data for 614 children from the cohort. The primary maternal justification for introducing ultra-processed foods was the claim that the baby was at the "right age" to start receiving these foods. Ultra-processed sweetened drinks were introduced because the child was at the "*right age*" or the "*baby needs*" this food. Among solids/semisolids, the most offered were cheese *petit suisse* (71.17%) and ice cream (42.67%), with mothers reporting "*baby needs it*" as the main reason for offering them. *Conclusion*: the introduction of ultra-processed foods (UPF) in the first year reflects maternal perception of these products as part of children's dietary routine, highlighting the importance of educational strategies and multisectoral interventions to promote healthy eating in early childhood.

Keywords: Complementary feeding. Feeding practices.Ultra-processed foods. Cohort studies.

Resumo

Introdução: As razões para a introdução de alimentos ultraprocessados na alimentação de lactentes são pouco conhecidas. *Objetivo*: Investigar as razões maternas para introdução de produtos ultraprocessados na alimentação de seus filhos durante o primeiro ano de vida. *Métodos*: Dados provenientes de estudo quantitativo de coorte prospectiva, estudo CLaB, com 656 binômios

mãe/filho em Botucatu, São Paulo. Em sete momentos ao longo do primeiro ano de vida, foi aplicado questionário que avaliou a introdução (sim, não) na alimentação do lactente de 10 alimentos ultraprocessados: achocolatado, refrigerante, suco industrializado, suco em pó, queijo *petit suisse*, embutidos, biscoitos recheados, salgadinhos de pacote, macarrão instantâneo e sorvete. No momento da primeira resposta "sim" para cada alimento, a razão para esta prática foi questionada. As respostas maternas foram agrupadas de acordo com sua natureza ou sentido. ***Resultado***: Foi possível obter dados para 614 crianças da coorte. A mais frequente razão materna para introdução de ultraprocessados foi a alegação de que o bebê estava na *"idade certa"* de começar a receber estes alimentos. Bebidas adoçadas ultraprocessadas foram introduzidas porque a criança estava na "*idade certa*" ou o "*bebê precisava*" deste alimento. Entre os sólidos/semissólidos, os mais oferecidos foram queijo *petit suisse* (71,17%) e sorvete (42,67%), com as mães citando "*bebê precisa*" como a principal razão para ofertá-los. ***Conclusão***: A introdução de AUP no primeiro ano reflete a percepção materna desses produtos como parte da rotina alimentar infantil, destacando a importância de estratégias educativas e intervenções multissetoriais para promover a alimentação saudável na primeira infância.

Palavras-chave: Alimentação complementar. Condutas na alimentação. Alimentos ultraprocessados. Estudos de coortes.

INTRODUCTION

There is a robust body of evidence supporting the dietary practices that are most conducive to adequate infant growth and development, while also reducing the risk of developing a range of chronic non-communicable diseases in childhood and adulthood, such as hypertension and diabetes, among others.[1] These are exclusive breastfeeding for up to six months and healthy Complementary Feeding (CF) for up to two years or more.[2,3]

It is recommended to offer fresh or minimally processed foods in the CF and avoid including foods sweetened with sugar, artificial sweeteners, honey,[3] and Ultra-Processed Foods (UPF) in the diet of children up to two years of age, except for milk formulas, which can be offered to non-breastfed children up to nine months of age.[3] However, studies have shown that the consumption of ultra-processed foods by children is common in Brazil and several other countries.

In Brazil, data from the *Estudo Nacional de Alimentação e Nutrição Infantil* (Brazilian National Survey on Child Nutrition - ENANI), a nationally representative survey, revealed that in 2021, 80.5% of children aged 6 to 23 months had consumed at least one UPF on the previous day.[4] Another Brazilian study, conducted in the state of Bahia, showed that UPF are introduced even before 6 months of age.[5]

The consumption of UPF during the first year of life has also been reported in countries such as Cambodia[6] and Argentina,[7] highlighting the urgency of addressing this issue, given that it is also recurrent in other countries.

To support successful interventions, it is important to examine what factors influence the availability of those foods in the first year of life. Food choices for infants go beyond biological aspects and involve cultural, socioeconomic, and emotional issues, which is no different when it comes to UPF.[2,8,9] A qualitative study conducted among mothers of children under 2 years of age found that convenience was the main reason they offered these foods. However, the counterargument that they are harmful to health was also cited as a reason for not offering them.[8]

However, studies in this area are quite rare, and the reasons for offering UPF may differ between locations and social contexts, a gap that this article aims to address. This study aims to describe the reasons reported by mothers/primary caregivers for introducing ultra-processed foods into their children's diets during the first year of life.

MATERIALS AND METHODS

This is a prospective cohort study based on quantitative data collected in 2015/2016 in the municipality of Botucatu, in the state of São Paulo, called *Coorte de Lactantes de Botucatu* (Botucatu Infant Cohort - CLaB). The cohort was recruited at a health unit responsible for conducting mandatory disease screening tests for newborns at the municipality's two maternity hospitals (public and private), which cover approximately 80% of births. A total of 656 babies from 650 mothers were included. The inclusion criteria for the CLaB study were: newborns of any gestational age and birth weight whose mothers were able to respond to interviews and resided in the urban area of the municipality.

The CLaB study was approved by the *Comitê de Ética em Pesquisa da Faculdade de Medicina de Botucatu* (Research Ethics Committee of the Botucatu Medical School), under CAAE registration number 67214217.5.0000.5411.

In this study, 12 twins and 3 children with special needs that interfere with breastfeeding and complementary feeding were excluded from the original cohort (n=656) of the CLaB study. With follow-up losses during the first year of life,

the study analyzed 614 children for whom it was possible to obtain reliable data on the reasons for introducing 10 ultra-processed foods during the first year of life, as defined by the NOVA food classification system:[10] a) ultra-processed sweetened beverages-chocolate drink, powdered juice mix, industrialized juice, soft drink; b) ultra-processed solids/semi-solids *petit suisse* cheese, processed meats, filled cookies, packet snacks, instant noodles, and ice cream.

Data on the frequency and age at which infants are offered each food during the first year of life have already been published.[11] However, information on maternal reasons for introducing UPF had not yet been analyzed, although data had been collected on this subject.

Information was collected through interviews, the first of which was conducted in person at the municipal neonatal screening unit shortly after the mother/newborn pair was included in the cohort. Subsequently, interviews were conducted in the infants' homesat 3, 6, 9, and 12 months of age and by telephone at 2 and 4 months of age.

Students and a team of home interviewers, with experience in previous projects, who were trained and supervised, participated in the data collection.

At all these times, a questionnaire was applied regarding the introduction (yes or no) of a list of foods into the infant's diet, selected based on previous studies conducted in the locality[12] and national studies on feeding in the first year of life.[13] Among the foods surveyed are the 10 UPF already mentioned.

When the mother's response was affirmative for the first time, that is, when the food in question had already been introduced into the infant's diet, the age at which it was first offered and the reasons/motivations for its introduction were investigated with the question: what was the reason/motivation for offering this food to the child (open question, without alternatives)?

Maternal responses, according to their main meaning, were previously classified based on the pilot study, namely: recommendation from the healthcare professional who monitored the infant at the health service; recommendation from healthcare professionals (from other services); recommendation from relatives/friends; decision by the mother herself. When the answer was the mother's decision, she was asked about the basis for her decision, and the answers were noted in full and later grouped into: the baby needs this food; the baby was at the right age to start consuming the food; the baby started eating what the family eats; the baby expressed a desire for the food; the mother wanted to give the food, without further explanation; the offer was due to financial constraints.

Data entry was performed using Microsoft Excel, with coding and typing of data carried out concurrently with collection, after critical analysis by the supervisor. Next, data consistency was verified and, when necessary, errors were corrected. The analyses were performed using the Statistical Package for the Social Sciences (SPSS) V. 20.0 for Windows.

RESULTS

Of the 614 mothers, 71.6% were between 20 and 34 years old, and 12.8% were adolescents. At the time of the child's birth, 43.5% were not in paid employment, and 12.3% did not live with a partner. Approximately half were primiparous (49.3%). Regarding education, 63.5% had completed high school, and 17.0% had up to 8 years of schooling. Just over half of the infants were born by cesarean section (52.1%), 6.1% weighed less than 2,500 grams, and 64.7% were born in a public hospital (data not shown in the table).

Ultra-processed sweetened beverages were introduced into the diets of less than 15% of infants, with powdered juice mix being the most common, in 13% of children (n=80), followed by chocolate drink (8% - n=49), soft drink (7.8% - n=48), and industrialized juice (6.2% - n=38). In the case of ultra-processed solid/semi-solid products, *petit suisse* cheese was introduced into the diet of 437 infants (71.2%), and 29% were given it before 6 months of age; the remaining products reached smaller proportions: ice cream, 42.7% (n=262); packet snacks, 26.9% (n=165); processed meats, 17.3% (n=106),

filled cookies, 11.4% (n=70); and instant noodles, 5.7% (n=35). In-depth analyses of the age of introduction of foods other than breast milk during the first year of life are presented in a previous publication.[11]

Table 1 shows the maternal reasons for offering ultra-processed sweetened beverages to infants. Regarding the powdered juice mix, 57.5% of mothers who gave this beverage to their children reported that they were at the "right age" to start consuming this product, and 32.5% responded that "the baby needed" it. This was also the most common explanation for introducing industrialized juice: 31.5% responded that it was the "right age". The offer of a chocolate drink and a soft drink was justified mainly because "the baby needs it," representing 44.9% and 60.4%, respectively. In addition, the response "right age" was mentioned by 42.9% and 12.5% of mothers as a reason for introducing the chocolate drink and soft drink, respectively.

Table 1. Maternal reasons for introducing ultra-processed sweetened beverages into their children's diets in the first year of life. CLaB Study, Botucatu, Brazil, 2015-2016.

Reasons	Chocolate drink (n=49)		Industrialized Juice (n=38)		Powdered juice mix (n=80)		Soft drink (n=48)	
	N	%	N	%	N	%	N	%
Recommendation from the professional who was monitoring the baby	-	-	9	23.7	-	-	-	-
Recommendation from relatives/friends	3	6.1	1	2.6	4	5	2	4.2
Recommendation from a health professional (other services)	-	-	-	-	-	-	-	-
Mother's decision/Baby needs it	22	44.9	11	28.9	26	32.5	29	60.4
Mother's decision/right age	21	42.8	12	31.6	46	57.5	6	12.5
Mother's decision/With family	-	-	1	2.6	-	-	1	2.1
Mother's decision/Baby wants it	-	-	2	5.3	3	3.8	5	10.4
Mother wanted to give it, without further explanation	2	4.1	2	5.3	3	3.8	4	8.3
Financial conditions	-	-	-	-	-	-	-	-

A dash (-) means that there were no answers

Table 2 shows the reasons for introducing solid/semi-solid UPF into infants' diets. Just over half (54.7%) of mothers who offered *petit suisse* cheese to their children did so because they believed that "babies need this food." This was also the most frequent reason for introducing processed meats (41.5%) and packet snacks (40.6%).

Table 2. Maternal reasons for introducing ultra-processed solid/semi-solid foods into their children's diets during their first year of life. CLaB study, Botucatu, Brazil. 2015-2016.

Reasons	Instant Noodles (n=35)		Processed meats (n=106)		Packet Snacks (n=165)		Ice cream (n=262)		Cheese *Petit Suisse* (n=437)		Filled Cookie (n=70)	
	N	%	N	%	N	%	N	%	N	%	N	%
Recommendation from the professional who was monitoring the baby	6	17.1	2	1.9	0	0	3	1.1	14	3.2	1	1.4
Recommendation from relatives/friends	3	8.6	3	2.8	3	1.8	5	1.9	18	4.1	3	4.3
Recommendation from a health professional (other services)	-	-	-	-	-	-	-	-	1	0.2	-	-
Mother's decision/Baby needs it	12	34.3	44	41.5	67	40.6	81	30.9	239	54.7	14	20
Mother's decision/right age	13	37.1	32	30.2	44	26.7	97	37	127	29.1	34	48.6
Mother's decision/With family	-	-	5	14.2	31	18.8	43	16.4	6	1.4	12	17.1
Mother's decision/Baby wants it	-	-	3	2.8	0	6.1	14	5.3		0.2	2	2.9
Mother wanted to give it, without further explanation.	-	-	4	3.8	9	5.5	12	4.6		5.0	3	4.3
Financial conditions	-	-	1	0.9	-	-	-	-		-	-	-

It is important to note that some mothers who introduced ultra-processed solid/semi-solid foods into their infants' diets reported that the reason was that the child started eating with the family or that it was a "family decision," so the introduction was almost natural. The frequencies of this reason were: packet snacks (18.8%), filled cookies (17.1%), ice cream (16.4%), and processed meats (14.2%). It is also worth noting that "recommendation from the professional who monitored the baby" was the reason given by mothers for introducing instant noodles (17.1%), processed meats (1.9%), ice cream (1.1%), *petit suisse* cheese (3.2%), and filled cookies (1.4%).

DISCUSSION

This study highlights a worrying scenario regarding the introduction of UPF into the diets of infants during their first year of life, often justified by perceptions such as "the baby needs it" and "the right age," revealing a lack of awareness among caregivers about its harmful effects. Furthermore, the influence of family customs and even the recommendation of healthcare professionals to introduce certain UPF into babies' diets indicate flaws in the dietary guidance provided by the services that monitored these children, such as a lack of information about the risks involved.[14] A 2021 scoping review linked UPF consumption to high levels of total cholesterol, LDL cholesterol, and overweight in preschoolers.[13]

Research conducted by Jerônimo et al.[8] in Rio de Janeiro showed that some mothers offered sugary UPF to children under 2 years of age to distract or please them. From an international perspective, a study in Uruguay involving 419 parents with babies up to 1 year old found that dairy desserts were seen as healthy and sausages as practical; in addition, parents were asked to indicate the first words that came to mind in relation to UPF. Parents of infants aged 1 to 4 months with lower educational and socioeconomic levels showed a higher likelihood of a positive affective response towards UPF.[15] Also in Uruguay, a study of parents of children aged 6 to 60 months showed that the provision of UPF was influenced by misconceptions about its healthiness, the search for convenience, and the desire to avoid stress. Noteworthy misconceptions include considering UPF healthy, associating the preparation of UPF (such as hamburgers and gelatin) with healthy eating, minimizing risks, and prioritizing convenience and children's enjoyment.[16]

In terms of our results, these reasons may be implied when mothers reported that "the baby showed a desire for this food" or "to eat with the family." In this sense, there may be a lack of knowledge about the harmful effects of UPF, insufficient or inadequate food education actions aimed at the maternal and child population, in addition to the presence of traditions and beliefs that allow UPF consumption by babies.

Concerns about the food's nutritional quality, recommendations from healthcare professionals, and the food's influence on the child's health emerged as the most relevant reasons for parents' choices regarding complementary feeding for their children, in a review of qualitative studies conducted in developing and developed countries. Nevertheless, the provision of foods recognized as unhealthy was justified on cultural grounds, family customs, or religious beliefs. Also, parents' food preferences appeared to be a determining factor in their choices: foods that mothers prefer are often offered, while those they reject are avoided.[17]

Considering the above review, parents' choices regarding feeding their babies and young children are complex and involve issues of health, culture, pleasure, and commercial aspects. Thus, it is not sufficient for healthcare professionals to point out the health benefits or harms of UPF in their efforts to promote healthy complementary feeding. It is also necessary to understand and address the traditions, tastes, and food preferences of parents or caregivers responsible for feeding babies, as well as the social context, including

the existence of advertising for UPF that is presented as suitable for children, with nutritional, health, and sensory claims.[18]

Despite the limitations of the quantitative design, which does not allow for in-depth data on mothers' reasons for offering UPF to their children, the results of this study have the advantage of a longitudinal design, a large sample representative of the locality, and the fact that they are protected from memory bias, since mothers were interviewed seven times during their child's first year of life.

CONCLUSION

The most common reasons mothers give for introducing UPF during the first year of life indicate that these products are perceived as part of a child's normal diet. This scenario highlights the importance of food and nutrition education strategies, combined with multisectoral interventions involving families, communities, health professionals, and the food environment, including the regulation of advertising aimed at children to promote healthy eating habits in early childhood.

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Contributors

Adriano TS participated in the conception and design, data analysis and interpretation, and manuscript revision; Alves MS and Gomes CB participated in the data analysis and interpretation, manuscript revision, and approval of the final version; Carvalhaes MABL participated in the conception and design, data analysis and interpretation, manuscript revision, and approval of the final version.

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