Home availability of ultraprocessed foods in families who prepare meals at home

Disponibilidade de alimentos ultraprocessados nos domicílios de famílias que preparam refeições em casa

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A B S T R A C T

Objective

This study characterized the degree of processing of the food items available at home and the routine of shopping for food in families with children and/or teenagers and whose meals are usually prepared at home.

Methods

Mixed methods (interview, questionnaires, and food inventory). Interview's transcripts were submitted to thematic analysis and the foods identified in the inventory were classified according to the degree of processing and analyzed for their availability and access in the home food environment.

Results

Results revealed the high availability of ultra-processed foods; that the supermarket was the main source of food acquisition; and that purchasing food is part of an organized routine where time and control of expenses are the most valued aspects.

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Conclusion

Actions which focus on planning and executing the acquisition of unprocessed and minimally processed foods are needed to promote greater availability and increased intake of such foods, so that the composition of homemade meals may be in line with what is recommended by the national dietary guidelines.

Keywords: Consumer behavior. Eating. Food preferences. Industrialized foods. Interview. Qualitative research.

R E S U M O

Objetivo

O presente estudo caracterizou o grau de processamento dos alimentos disponíveis e a rotina de compra de alimentos de famílias com crianças e/ou adolescentes e que costumam preparar refeições em casa.

Métodos

Métodos mistos (entrevista, questionário e inventário de alimentos). As transcrições das entrevistas foram submetidas à análise temática e os alimentos identificados no inventário foram classificados segundo o grau de processamento e analisados quanto à disponibilidade e acessibilidade no ambiente alimentar domiciliar.

Resultados

Os resultados revelaram que a disponibilidade de alimentos ultraprocessados foi alta; que o supermercado foi o principal local de aquisição de alimentos e que a compra de alimentos faz parte de uma rotina previamente organizada em que o tempo e o controle de gastos são os aspectos mais valorizados.

Conclusão

Ações focadas no planejamento e execução da compra de alimentos in natura e minimamente processados são necessárias para promover maior disponibilidade domiciliar e, consequentemente, o consumo de alimentos in natura e minimamente processados, aproximando as refeições realizadas em casa do que é preconizado pelo Guia Alimentar para a População Brasileira.

Palavras-chave: *Comportamento do consumidor. Ingestão de alimentos. Preferências alimentares. Alimentos industrializados. Entrevista. Pesquisa qualitativa.*

I N T R O D U C T I O N

According to the last *Pesquisa de Orçamentos Familiares* (POF, Consumer Expenditure Survey), the percentage of household spending with food in Brazil decreased from 75.9% in 2002-2003 to 67.2% in 2017-2018. At the same period, the participation of Ultra-Processed Foods (UPF) in the Brazilian diet has increased [1]; Since the early 2000s, UPF prices in Brazil have consistently decreased. By 2030, these foods are expected to cost less than Unprocessed or Minimally Processed foods (U/MP) [2].

The UPF are industrial formulations with minimum or little whole foods, with large amounts of substances extracted from foods (fats, sugar), contained in food (modified starch, hydrogenated fat), or synthetized in laboratories (scents, coloring, other additives) [3]. The UPF may be employed to replace a meal or used as ingredients for culinary preparations [3-5].

One of the ways to improve the quality of the diet is cooking frequently, as it tends to increase the consumption of fruits and vegetables [6-8]. The Dietary Guidelines in many countries stimulate preparing meals with fresh and minimally processed foods [3,9-12]. The G*uia Alimentar para População Brasileira* (GAPB, Dietary Guidelines for the Brazilian Population) favor eating at home, highlighting the nutritional quality of meals based on unprocessed foods and culinary preparations, not in UPF [3].

The study of the habits related to food acquisition in the household is important when developing nutritional interventions within the family, as a change in the quality of the available food may increase the

efficacy of these actions [13]. Studies in the home environment may raise awareness regarding food choices and the root causes of behavior in disagreement with the guidelines [14]. Studies about the home food environment point that the presence of children and teenagers in families influences the habits of food acquisition and home availability, and that responsible parents influence children's and teenagers' eating habits [15,16].

The choices at the moment of food purchase reflect the initial consumption chain in the home food environment. As soon as the acquired food is taken to the house, it becomes a part of the family environment, and it influences the entire family's eating habits [15].

The present study aimed to characterize the degree of processing in the food available at home and the shopping routines of families with children and/or teenagers that frequently prepare their meals at home.

METHODS

The research purposefully recruited individuals living in the urban area of *Florianópolis*, in the Brazilian state of *Santa Catarina*, responsible for purchasing the food in their families, and whose households included at least one child or teenager who had at least seven main meals (lunch and/or dinner) at home per week [8].

The recruitment happened online in social media and in person among the academic community of one university. The snowball method, in which the recruited individuals suggested other potential participants, was employed [17]. We selected only individuals who were not in situations of social vulnerability, so as to avoid having the family's financial situation superposed to other determinant aspects. The minimum number of participants for the data collection in the family inventory was based on a study with a similar approach [18]. However, the data collection was interrupted only at the saturation point, when no new information came up in the interviews conducted to understand the families' shopping behavior [19].

After being presented with explanations of the data collection techniques, all the participants signed a Free and Informed Consent Term. The research was approved by the Institutional Committee of Ethics in Research with Human Beings (opinion n° 1.723.746).

The data collection was carried out in November and early December 2017 and in February 2018, following the school calendar, so that all family routines were happening normally. It took place in the participants' households at a single and specific time and date chosen by the participant, always up to two days after the larger acquisition of food in the households (as reported by the participants, regardless of the frequency of shopping) [20]. Sociodemographic, economic, and health data from the participants were collected with a questionnaire (Chart 1).

A smartphone camera was used to picture all the food present in the kitchen or reservoir, where it was kept (benches, fruit baskets, freezers, fridges, cupboards) without changing their position. Afterwards, all the items were pictured individually to collect the list of ingredients of each packaged product to characterize their degree of processing. Animal foods, culinary preparations, and children's formulas were not included in the inventory [21]. The repeated foods were registered and counted only once, regardless of the quantity available at the house. The list of food items to be analyzed was thus constituted [21].

After the inventory, semi-structured interviews were conducted to obtain information on the participants' shopping behavior. All the interviews were carried out by the same researcher using a semi-structured questionnaire based on the literature and discussed with specialists in qualitative research, eating habits, and consumer behavior (Chart 2).

Chart 1 – Sociodemographic and socioeconomic characteristics of the adults responsible for shopping for food in households. *Florianópolis*, (SC), Brazil, 2018.

	Family Composition	Respondent (sex, age, schooling, ccupation)	FI (MW)	Food-related disease	Place/ frequency of shopping
1	Couple and two female kids (19 and 26 years-old)	Woman, 52 years old, higher education	10–15	AH and CVD	Fruit stands (Weekly) Supermarkets in other neighborhoods (Monthly)
2	Couple and two male kids (12 and 18 years-old)	Woman, 46 years old, complete higher education	15–25	No	Supermarkets in other neighborhoods (Weekly) Fruit stands (Weekly) Grocery Stores nearby (undefined)
3	Couple and two female kids (10 and 17 years-old)	Woman, 44 years old, incomplete higher education	2–3	No	Supermarkets nearby (Weekly) Supermarkets in other neighborhoods (Monthly)
4	Couple and one female kid (03 years-old)	Woman, 34 years old, complete higher education	6–10	No	Supermarkets nearby (2-3 times a week) Supermarkets in other neighborhoods (Monthly)
5	Grandparents' couple, son, former daughter-in-law, grandson (10 years-old)	Woman, 56 years old, complete higher education	>25	AH	Supermarkets nearby (Weekly) Fruit stands in other neighborhoods (Undefined frequency)
6	Couple and one male kid (03 years-old)	Woman, 28 years old, complete higher education	6–10	Lactose intolerance; gastro-intestinal disturbance	Supermarkets nearby (Weekly) Fruit stands in the neighborhood (every two weeks) Natural products nearby (undefined) Wholesale store in a near city (monthly)
7	Couple and one female kids (02 years-old)	Man, 34 years old, complete higher education	6–10	No	Supermarkets nearby (Weekly) Fruit stands in other neighborhoods (Every 2 weeks) Wholesale store in a near city (monthly)
8	Couple, brother, and two male kids (08 and 15 years-old)	Woman, 42 years old, incomplete higher education	3–6	No	Supermarkets nearby (Daily) Wholesale store in a near city (every two weeks) Supermarkets in other neighborhoods (Monthly)
9	Couple and one female kid (05 years-old)	Woman, 38 years old, complete higher education	3–6	No	Supermarkets nearby (Weekly) Supermarkets in other neighborhoods (Weekly) Wholesale store in a near city (monthly)
10	Couple and two male kids (02 and 05 years-old)	Woman, 38 years old, complete higher education	3–6	No	Organic fair (weekly) Fruit stands in the neighborhood (Weekly) Supermarkets in other neighborhoods (Weekly) Wholesale store in a other neighborhood (monthly)
11	Couple and two male kids (12 and 14 years-old)	Woman, 43 years old, complete higher education	>25	Pre-diabetes	Supermarkets in other neighborhoods (Monthly) Supermarkets nearby (Weekly)

Note: AH: Arterial Hypertension; CVD: Cardiovascular Disease; FI: Family Income; MW: Minimum Wage.

The sample was characterized according to the demographic, socioeconomic, and health data collected with a questionnaire. These data were presented in a descriptive analysis and based the interpretation and discussion of the data on household availability and shopping behavior.

The food items identified in the inventory were categorized into the four groups proposed by the NOVA classification [4], as follows: (a) Unprocessed and Minimally Processed foods (U/MP); (b) Processed Culinary Ingredients (PCI); (c) Processed foods (P); and (d) UPF. The categorization according to the purpose and extension of processing relied on the information in the item's list of ingredients, according to the United Nations Food and Agriculture Organization [22]. After reading the list of ingredients, the food items were

Chart 2 – Script of the semi-structured interview. *Florianópolis* (SC), Brazil, 2018.

Interview Script
A – "Ice break" question
To begin, can you tell me a little about you, your family, and your main daily occupations and routines?
B – Shopping behavior
Could you tell me about the day when you shop for food? Start before you leave home until you return.
Topics to be approached during the speech, if not naturally brought up by the interviewee:
- Pre-shopping plan: using lists, checking the items in the cupboard/fridge
- Place of shopping (reason for choosing, location)
- Who goes shopping? (kids, partner)
- Aspects that influence the selection of food during shopping
- Frequency of shopping (reason for choosing)
- Transport used during shopping
- Time of shopping in the family's routine (time, day of the week)
- Returning from shopping (who organizes the food bought)

classified into a decision flowchart and the classification was checked by a second researcher [23]. In the absence of the list of ingredients, the food items were classified using similar products, with a conservative criteria based on the smallest degree of processing [24].

The content recorded during the interviews was transcribed verbatim and the transcripts were subjected to thematic analysis [25]. Crude data (expressions, sentences) were transformed into codes related to the objects of study. The method of thematic analysis allows grouping common ideas, trends, and themes. It was carried out in the following stages: repeated readings of the manuscript, creation of the initial codes, grouping of codes into themes, revision, refinement, definition, and analysis of the themes [25]. The stages of creation and refinement of themes and codes were carried out by two researchers with experience in qualitative research and thematic analysis.

RESULTS

The research analyzed eleven households on which the participants were responsible for the acquisition of food (10 women, 1 man). The age of the respondents varied from 28 to 56 years, with a median of 42 years. All the participants had reached higher education (having completed an undergraduate course or not). The most prevalent family income strands (n=6) were three to six minimum wages and from six to ten minimum wages (2862.00 Brazilian Reais to BRL$ 5724.00). In four households, inhabitants with diagnoses of food-related morbidities (diabetes mellitus, cardiovascular disease, arterial hypertension, and lactose intolerance) were present (Chart 1).

In the stage of household inventory, 1,572 food items were registered (an average of 143 items per household, DP=13). The availability of U/MP/MP/PCI/P food items varied from 43% to 87% in the assessed households, while the availability of UPF varied from 13% to 57% (Chart 3). The five most present types of UPF were cookies, cheeses, ready sauces, gelatin/pudding powders, and yoghurt, followed by bread, mayonnaise, instantaneous pasta, juice powder, yeast, and sausages.

All the interviewees reported that most of the acquisitions happened in supermarkets; some mentioned complementary shopping in wholesale or small grocery stores close to their residences. As to fruits and vegetables, five participants mentioned shopping in vegetable stands. Only one mentioned going to open street fairs (Chart 1).

Chart 3 – Characterization of families according to the shopping behavior regarding food and household food environment (continues). *Florianópolis* (SC), Brazil, 2018.

Family code	FC	Characterization of the family according to the shopping behavior regarding food	(%)	Food Classification U/MP PCI and P	UPF
1	Couple and two female kids (19 and 26 years-old)	The mother is responsible for planning, shopping, and organizing. Monthly planning with lists (checklist with precise quantities for the family monthly consumption). Family has a lactose-intolerant member. Husband comes to the shop with wife, helps transport the products from the car to the kitchen, and is also responsible for shopping for vegetables and fruit in stands during the weekends. They have a rural property in a nearby city, where they plant diverse vegetables and fruits, and have chicken	Ava.	64	36
2	Couple and two male kids (12 and 18 years-old)	The mother is responsible for planning, shopping, and organizing. The children shop in a nearby grocery store when they "miss" any item for specific preparation. The store takes notes of the purchases, and the mother pays at the end of the month. Spices planted in the backyard	Ava.	67	33
3	Couple and two female kids (10 and 17 years-old)	The mother is responsible for planning, shopping, and organizing. Gets food in the supermarket that accepts the vouchers her husband gets in his job. She goes by car and plans the monthly shopping with lists. She takes notes of quantities for a month. Weekly purchases without lists, mostly for promotions and family events. The family reduced their shopping frequency to reduce spending, avoiding buying pastries, bread, and sweets, and working within the limits of the voucher. They have fruits and spices in the backyard	Ava.	59	41
4	Couple and one female kid (03 years-old)	The mother is responsible for planning, shopping, and organizing. She plans the shopping with lists, except for bread and pastries. She includes the purchases in her routine and that of her daughter, so that moving to the shopping place by car is part of her usual trajectory and that her daughter is with her grandmother or in school during shopping	Ava.	43	57
5	Grandparents' couple, son, former daughter-in-law, grandson (10 years-old)	Mother/grandmother is responsible for planning, shopping, and organization. The husband goes with her. They go by car. She usually used lists for weekly shops, but some products are bought in the list at the daily usual time of buying bread. They have spices planted at home	Ava.	71	29
6	Couple and one male kid (03 years-old)	Mother and father plan and shop for food together. The selection of products in the place of purchase and the organization of the items is made primarily by the mother, who prepares most meals. They make individual shopping lists, but these lists are not taken to the market, as writing the list is enough to remember them. Lactose-intolerant son with an "intestinal motility problem" requires high fruit availability at home, according to the parents. Daily school supper, which should contain one fruit. Spices and edible foods planted in the apartment where they live	Ava.	87	13
7	Couple and one female kid (02 years-old)	The father is responsible for choosing and visiting the place of shopping, guided by a list prepared by the mother. Most lunches during the week happen in the grandmother's house. They go to the shopping places by car	Ava.	49	51
8	Couple, brother, and two male kids (08 and 15 years-old)	The mother is responsible for planning, shopping, and organizing. She believes that going to the supermarket everyday reduces food and money waste, as she buys promotional items	Ava.	58	42
9	Couple and one female kid (05 years-old)	The mother is responsible for planning, shopping, and organizing. Husband and daughter go shopping with her. Purchases guided by a list containing the necessary quantity for a month's consumption	Ava.	49	51
10	Couple and two male kids (02 and 05 years-old)	Mother does most food shopping. Husband does the weekly shopping when going home after picking the daughter up at school. In the fruit stands, he buys what he cannot find in organic fairs	Ava.	68	32

Chart 3 – Characterization of families according to the shopping behavior regarding food and household food environment (continues). *Florianópolis* (SC), Brazil, 2018.

Family code	FC	Characterization of the family according to the shopping behavior regarding food	(%)	Food Classification	
				U/MP PCI and P	UPF
11	Couple and two male kids (12 and 14 years-old)	The mother is responsible for planning and shopping for food. A domestic worker in the house organizes the items. The husband goes shopping with her and sometimes helps in the selection of vegetables and meats. Foods like bread are frozen and foods are bought in large quantities to avoid going to the supermarket. She makes lists only for buying specific products, which are not frequently bought. Every two months, she shops online in the same supermarket. Family members with pre-diabetes. This factor was not related to the family's food shopping or consumption	Ava.	52	48

Note: AVA: Availability; FC: Family Characterization; P: Processed foods; PCI: Processed Culinary Ingredients; U/MP: Unprocessed and Minimally Processed Foods; UPF: Ultra-Processed Foods.

Chart 4 – Themes and categories related to the shopping behavior of the adults responsible for food shopping in the household. *Florianópolis* (SC), Brazil, 2018.

Theme	Categories	Codes
Planning the acquisition	Organizing time Getting more food with the same money Planning (or not) what to buy Considering the size of the cupboard/ what is in it before shopping Receiving visits Feeding the Family Planting food	Organizing time Getting more food with the same money Planning (or not) what to buy Considering the size of the cupboard/ what is in it before shopping Receiving visits Feeding the Family Planting food
Selecting food items	The value of food What I look for in food What I planned versus what I bought	Price promotions Information on labels (expiration date, ingredients) Sensorial aspects Being organic Duration Being or not in the shopping list Desire (not in the list)
Choice of the place for shopping	Convenience Availability and quantity of food Human and physical resources Prices	How easy it is to pay (vouchers, pay later) How easy it is to access / home proximity Variety of products / brands / prices Offer of fruits and vegetables Having a butchery / bakery Good sensorial quality of products Organization / Cleanliness / illumination Workers Trust Low price / saving money Daily promotions Lines
Assessing the experience of going shopping	Pleasure in choosing, shopping, and having a full cupboard Unpleasant feelings when planning, buying, spending time, and money	Saving money, being pleasant, liking, feeling calm, easiness, comfort Lack of organization, time demand, spending, feeling tired or lazy, being unpleasant, not liking, task, obligation

Most interviewees (n=9) reported shopping for food monthly and complementing it with purchases every day, week, or every two weeks, which were mostly of bread, fruit, vegetables, or other items for preparations planned for the same day. The other participants (n=2) mentioned weekly shopping for food (Chart 2).

The thematic analysis of the interviews led to the identification of codes in the manuscript, grouped into four themes: (a) Planning the acquisition; (b) Choice of the place for shopping; (c) Selecting food items during the acquisition; (d) Assessing the experience of going shopping (Chart 4).

a) Planning the acquisition

The main aspects identified in the interviews regarding the planning of the food acquisition were related to the organization of time and the previous definition of which products should be bought. Organizing the time for going shopping was related to the need for adapting to the time children were at school or with some caregiver, as well as with the adults' work schedules, and the times when less people were in the markets. Interviewees sought to optimize time and avoid unnecessary displacements: "(...) *I leave my job, go shopping, and pick her* [daughter] *up. I don't go out only for shopping, I fit it in my routine*" (Family 4).

The participants reported checking the storage capacity and the items available in the household before shopping, so as to decide what and how much to buy. Elaborating lists for larger acquisitions (monthly or weekly shopping) was also mentioned as a way of buying the sufficient amount of food for consumption, avoiding excessive shopping, getting superfluous items (like goodies), and food waste.

Preferences, health issues, and diets followed by family members were mentioned in all the families as determinant of the acquired items. Another motivator for the purchase of fruits was the school supper. Among the four families that reported diseases related to food among the household members, three affirmed they considered these diagnoses when shopping for food. Many times, the acquisition of items that are appreciated but considered unhealthy is limited by the responsible for the acquisition to avoid excessive consumption: "*He needs to eat a lot of fruit (…) He is intolerant to milk... he has a problem of intestinal motility. And we know that… ultra-processed things will be bad for him*" (Family 6).

b) Choice of the place for shopping

The interviewees picked and visited the place where they recognized greater financial savings base on their previous experience. They also sought information on promotions and sales in different markets before choosing where to shop and demonstrated knowledge of the days of promotions. "*Tuesday... is the day when things are cheaper... it is a good day* [for shopping]" (Family 3).

Other factors in this choice are the variety of available products, the quality of the service, cleanliness and organization, and proximity to the household: "*They are always there, always nice, everything is super clean. That is how I like markets to be*" (Family 5).

c) Selecting food items during the acquisition

The main aspects in this theme were related to the prices and characteristics of the food items. The price was a determinant factor in the quantity and type of acquired food. For fruits and vegetables, usually not included in shopping lists, the criteria included promotions and sales or prices within a determined limit: "*We have a limit, the price of the kilo (…) we don't buy anything above 2.99 reais per kilo because it is probably out of season… it is too expensive and there is a better time to buy it during the year*" (Family 6).

The food promotions were determinant for purchasing larger quantities than planned, as a way of enjoying the reduced prices. Although they made shopping lists, there was also impulse buying identified in food shopping.

d) Assessing the experience of going shopping

Positive emotions like feeling happy and satisfied that the fridge was full, and pleasure in selecting and buying food were related to the shopping routine. A participant reported that "*I like coming home and having the fridge full, the cupboard full (…) it makes me feel really good, like I am not going to have to go out to get anything (…) if I want to make any recipe, I'll have everything I need for it (…) It's a good feeling, I have to confess I like it (…) it's calm*" (Family 6).

On the other hand, if the activity is framed as an obligation within the family, its potential to generate satisfaction is reduced: "*I don't like going to the supermarket, but there is no choice. I chose to have kids, to have a home*" (Family 10).

DISCUSSION

The people responsible for the family shopping were mostly women. Therefore, the responsibility for the family food is still determined by gender, similarly to what other studies identified [26,27].

All the participants mentioned the supermarket as the main place for shopping for food, a situation already identified in the 2008-2009 Consumer Expenditure Survey (POF) by Machado *et al.* [28]. According to the analysis, supermarkets are the main places for acquiring food in Brazilian families. This is a cause for preoccupation, as supermarkets also account for almost two thirds of the calories derived from UPF in the Brazilian diet [28].

The families in the study who had more unprocessed or minimally processed foods at home shopped weekly for food and vegetables in fruit stands. Fairs, stands, small producers, and butcheries provide more than two thirds of the calories derived from unprocessed and minimally processed foods in the Brazilian diets [28]. Therefore, the larger frequency in stands, besides supermarkets, may have contributed to the high availability of unprocessed /minimally processed foods in the studied households.

Most interviewees (n=9) reported monthly shopping and complementary visits to the store to buy perishable items like fruit, vegetables, and bread. This may be considered a positive result, given that a study identified that buying fruits and vegetables is often associated with the increased consumption of these foods [29].

The expressive quantity of UPF in the investigated households may indicate that despite usually having their meals at home, families may find it difficult to follow the recommendations regarding their diets and the preparation of food with unprocessed or minimally processed foods [3]. The GAPB stimulates preparing food at home to increase U and MP foods. However, even in our study population, composed of families who had their meals at home, we observed that the availability of UPF was expressive in most households [3]. Among the more frequent UPF are cookies and filled pastries, which are not common in main meals. However, other frequent foods like ready sauces, cheeses, and instantaneous pasta may be present in main meals like dinner and lunch, fully replacing a meal (instantaneous pasta) or as part of culinary preparations (cheese and ready sauces).

UPF consumption is related to the significantly increased risk of being overweight and obese, having metabolic syndrome, type-2 diabetes, cancer, and cardiovascular disease in adults [30,31]. Among children and teenagers, UPF consumption was associated with cardiometabolic risk and asthma [31]. In the present study, four families reported diseases related to food like hypertension, cardiovascular disease, and diabetes. The three families in the study that indicated they considered these diseases when shopping for food had more unprocessed and minimally processed foods at home. These results may indicate that such a diagnoses may influence the family's food choices.

The habit of making shopping lists was associated with a larger consumption of fruits and vegetables [32]. However, in the present study, although participants reported planning and using these lists as one of the aspects in the planning of the shopping, vegetables and fruits were not included in these processes. Thus, health-promoting strategies that seek to foster the consumption of unprocessed foods and culinary preparations using them, may focus on the adequate planning of purchases to adapt them to acquisition and consumption guidelines as per the GAPB [3].

Regarding the places where families bought food, the main aspect of that choice were the prices, similarly to what was found in an American research [33]. Nevertheless, our study showed that more frequent acquisitions, on a monthly or weekly basis, were mostly guided by the proximity of the shops to the house – possibly, having less products in the shopping list allow for price not being the main factor in that decision.

The selection of foods while shopping was based mostly on prices, a situation reported in other publications on the theme [33,34]. Although the cost of meals based on unprocessed and/or minimally processed foods is reduced compared to UPF-based meals [35], promotions or prices lower than expected in shopping places were referred to as determining the quantity and types of products acquired by the participants in the study. Other research shows that prices may be a barrier to picking healthy foods [36,37], especially considering that processed and ultra-processed foods are more commonly offered in promotions than unprocessed and minimally processed foods [3]. UPF are broadly advertised by marketing campaigns that use techniques based on studies on behavioral motivation and consumer science – which may stimulate more consumption of these products while shopping, given the exploration of beliefs, desires, and illusions [34].

Also, regarding the selection of food in acquisition places, reading labels was not a recurrent practice among the participants. Nevertheless, this is essential for selecting food items within the national recommendations for health eating, as it makes it possible to identity an ultra-processed item [3,22]. Besides, substances exclusively found in UPF that must be avoided are found in different proportions in the same food of different brands. Thus, reading the label is essential for knowing how healthy (or unhealthy) the food choices are.

Positive perceptions on shopping for food were reported by the participants, which is associated with the adequate consumption of fruits and vegetables [32]. However, female participants that related the shopping with negative emotions mentioned feeling obligated, something possibly inherent to the social role expected of mothers. We suggest that health-promoting strategies and discussions include the debate on distributing the responsibility for the family's diets and habits, including tasks like planning and shopping for food, so as to promote a more equal home environment where everyone is able to perform such tasks.

The selection of participants was intentional so as not to include socially vulnerable families. As a result, the participation of individuals with superior levels of education and good socioeconomic conditions was increased. This has possibly influenced the larger availability of fruits identified in food inventory, also described in Masters *et al.* [38].

One of the strongest points of the study was its sample, composed only by families that had seven or more main meals (lunch and/or dinner) a week at home. The reduced number of participants does not allow generalizations of the results for other populations. However, it does contribute to the discussion due to the direct observation (inventory), considered the golden standard in food availability studies [21], that allows a detailed analysis of the food environment. Besides, the data on the practices and perceptions of the shopping behavior was collected in the interview, allowing themes to come up spontaneously and not restricting the questions to the themes described in the literature.

The methodology employed for the categorization of food in this study (NOVA) classifies items as to the extent and purpose of processing, according to the list of ingredients in the products, including substances not recommended for consumption, like additives, trans fats, and added sugars [4,22,23]. As the studies of home food environment use classifications of foods into food groups [39-42], these may underestimate the quantity of UPF in households.

The interviewed families made their meals at home. However, what cooking means varied among individuals. Some define it as the exclusive use of unprocessed foods, while others consider any food prepared at home, like heating up ready meals, as part of a preparation [43].

CONCLUSION

The simultaneous and detailed study of two aspects that directly influence food consumption – the home food environment and the shopping behavior – fills in a gap in the scientific literature and may subsidize nutritional interventions in the family environment. As the domestic availability of UPF was high and the aspect consumers value the most was expenditure control, the results point to the importance of actions focused on the planning and acquisition of unprocessed and minimally processed foods so as to promote the larger domestic availability and consumption, approaching home meals and the Dietary Guidelines for the Brazilian Population.

CONTRIBUTORS

TR PRADO participated in the conception, data collection, data analysis and interpretation, writing, and critical review of the intellectual content, as well as of the approval of the final version. AM BOTELHO and AC MAZZONETTO participated in the analysis and interpretation of the data, critical review of the intellectual content, as well as of the approval of the final version. GMR FIATES coordinated the project and participated in the conception, analysis, and interpretation of the data, critical review of the intellectual content, and of the approval of the final version. All authors are responsible for every aspect of the work and for ensuring its preciseness and integrity.

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