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This article originated from the graduation course conclusion work, with the same title "Habilidades culinárias parentais e consumo infantil de alimentos in natura ou minimamente durante a pandemia do COVID-19", by the author Carolina Sant Anna de Menezes, defended on June 7, 2021, in the Nutrition Course of the Federal University of Health Sciences of Porto Alegre (Universidade Federal de Ciências da Saúde de Porto Alegre) Porto Alegre, RS, guided by Professor Fabiana Viegas Raimundo.

Parents' cooking skills confidence and child consumption of unprocessed or minimally processed foods during the COVID-19 pandemic

Habilidades culinárias parentais e consumo infantil de alimentos in natura ou minimamente durante a pandemia COVID-19

Abstract

Introduction: The Dietary Guidelines for the Brazilian population recommends the promotion and transmission of cooking skills as a tool for building healthy eating habits. In this context, the literature demonstrates the possible relationship between parents' cooking skills and the reduction of low nutritional value foods by children.

Objective: To assess the association between parents' cooking skills and children's consumption of in natura/minimally processed foods during the Covid-19 pandemic.

Methods: Cross-sectional study, conducted online, with parents of children aged 2-9 years. Cooking skills were assessed using a questionnaire based on the Dietary Guidelines for the Brazilian population. Food consumption was assessed using a structured questionnaire adapted from the markers of food consumption of SISVAN.

Results: Of the 517 evaluated children, 27.3% showed a low frequency of consumption of vegetables and 35% of raw salads. Cooking beans in a pressure cooker and preparing homemade tomato sauce were the skills in which a greater number of adults reported feeling less confident. Higher parents' cooking skills were significantly associated with higher consumption of vegetables ($p=0.002$) and raw salads ($p=0.024$). **Conclusion:** The findings of the present study demonstrate, based on the association between cooking skills and children's food consumption, that food and nutrition education strategies encourage the development of these skills, and can be effective actions to promote healthy eating habits in families.

Keywords: Food Intake. Child. Cooking. Parents. Covid-19.

Resumo

Introdução: O Guia alimentar para a população brasileira recomenda a promoção e transmissão de habilidades culinárias como ferramenta de construção de hábitos alimentares saudáveis. Nesse contexto, a literatura demonstra a possível relação entre as habilidades culinárias parentais e a redução no consumo de alimentos de baixo valor nutricional por parte das crianças. **Objetivo:** Avaliar a associação entre as habilidades culinárias parentais e o consumo infantil de alimentos *in natura*/minimamente processados durante a pandemia de Covid-19. **Métodos:** Estudo transversal, realizado *on-line*, com pais ou responsáveis de crianças de 2-9 anos de idade. As habilidades culinárias foram avaliadas por meio de questionário baseado no Guia alimentar para a população brasileira. O consumo alimentar foi avaliado por meio do questionário estruturado adaptado do instrumento de Marcadores Alimentares do SISVAN. **Resultados:** Das 517 crianças avaliadas, 27,3% apresentaram baixa frequência

no consumo de verduras e/ou legumes e 35% de saladas cruas. Cozinhar feijão na panela de pressão e preparar molho de tomate caseiro foram as habilidades em que um maior número de adultos relatam se sentir nada confiantes. O maior grau de habilidades culinárias parentais foi significativamente associado ao maior consumo de verduras e/ou legumes cozidos ($p=0,002$) e saladas cruas ($p=0,024$). **Conclusão:** Os achados do presente estudo demonstram, com base na associação entre habilidades culinárias e consumo alimentar infantil, que estratégias de educação alimentar e nutricional que fomentem o desenvolvimento dessas habilidades podem ser ações efetivas para promover hábitos alimentares saudáveis nas famílias.

Palavras-chave: Ingestão de Alimentos. Criança. Culinária. Pais. Covid-19.

INTRODUCTION

The World Health Organization (WHO), in the face of the Covid-19 outbreak and due to its rapid global spread, declared a pandemic state.^{1,2} In Brazil, as in many countries, several control and prevention measures were adopted, such as social distancing.³ Face-to-face activities were suspended in schools and companies, which may have changed family dynamics and intensified interactions between children and their caregivers. This new dynamic has affected the entire population. Emotional reactions and behavioral changes frequently present in children during the pandemic have been characterized by difficulties in concentration, irritability, fear, restlessness, boredom, feeling of loneliness, changes in sleep and eating patterns.⁴

The family environment affects children's food consumption in several aspects. The way which a meal is prepared affects the quality of children's food consumption. From this perspective, the Dietary Guidelines for the Brazilian population define cooking skills as necessary skills to select, prepare, season, cook, combine and present meals.^{5,6} There is also a tendency to weaken the passing down of cooking skills to the next generation, and therefore the Dietary Guideline stresses the importance of sharing these skills. In addition, this guideline suggests that parental cooking skills act as a protective factor against the consumption of ultra-processed foods, signaling the need to revalue cooking to promote adequate and healthy food.⁷ In addition, eating habits practiced in adult life are influenced by those learned in childhood, highlighting the importance of keeping healthy eating habits at this stage of life.⁸

Considering that some aspects of the family environment may influence children's food consumption and that in the pandemic period, family dynamics, as well as food decisions may have undergone changes, this study aimed to evaluate the possible association between parents cooking skills regarding the frequency of consumption of in natura/minimally processed foods by children (2-9 years old) during the Covid-19 pandemic in 2020

METHODS

This is a cross-sectional study conducted with parent/children (2-9 years old) pairs in October 2020. The term parents is used to refer to the adult responsible for feeding children at home. Data were collected using an online questionnaire developed on the REDCAP (Research Electronic Data Capture) platform. The survey was disseminated on social networks (Instagram, Facebook, and WhatsApp) using an invitation text. Parents interested in participating in the study accessed the provided link and, after reading and accepting the written informed consent form, answered the questionnaire automatically made available for completion. The questions were about socioeconomic and demographic characteristics, child consumption of in natura/ minimally processed foods, and parents cooking skills. Data from children with endocrine, genetic, and neurological diseases identified in the parents' reports were excluded from the study.

The sample size calculation was performed using the WinPepi program, version 11.65, using a power of 80%; the reference for the prevalence of healthy food consumption was 50%, with a significance level of 95% and an acceptable difference of five percentage points. The reference of 50% was used due to the discrepancy in how the evaluation was carried out. We considered this reference to obtain the largest possible sample size. The total calculated sample size was 385, plus 10% to adjust for possible confounding factors, totaling a necessary sample of 424 individuals.

The structured questionnaire included questions regarding the socioeconomic and demographic characteristics of the children's parents and families. These characteristics included sex, age, schooling level, profession, marital status, degree of kinship with the child, and the person responsible for purchasing and preparing food at home.

Parents cooking skills were analyzed using the Cookink Skills Index (IHC). This instrument assesses the degree of confidence in the performance of ten different cooking skills, described in chart 1, and was prepared based on the

definition of the Dietary Guideline for the Brazilian Population (2014). Each question regarding cooking skills is evaluated in raw scores, according to the degree of confidence that the interviewee refers to the performance of each skill. The response options feature a four-item scale in which the option "not confident" is equivalent to 0 points, "little confident" to 1 point, "confident" to 2 points and "very confident" to 3 points. The sum of the scores obtained varies between zero and 30 and they are later transformed into a scale between zero and 100. This scale summarizes the cooking skills of each interviewee and their Cooking Ability Index (HCI) score; the higher the score, the greater the cooking skill confidence.⁶ The frequency of consumption of in natura/minimally processed foods was evaluated through a structured questionnaire based on an adaptation of the instrument "Food Markers - SISVAN, 2008" developed by the Food and Nutrition Surveillance System (SISVAN) in 2008, as part of its protocols.⁹

This questionnaire investigates the consumption of five food categories in natura and/or minimally processed in the last seven days prior to answering the questions. A healthy food marker is considered when the frequency of the consumption of raw salad, cooked legumes and vegetables, fresh fruit or fruit salad, milk or yogurt is higher or equal to five times a day.

Data were directly collected in Redcap and analyzed in SPSS 25.0 (*Statistical Package for the Social Sciences*). Descriptive analysis was performed using means and standard deviation for continuous variables of symmetrical distribution or median and interquartile range for continuous variables of asymmetrical distribution. Categorical variables were described by absolute and relative frequencies. The association between the cooking skill scores and the frequency of consumption of raw/minimally processed foods was assessed using the ANOVA test. The significance level adopted was 5%

Chart 1. Cooking skills assessed in the Cooking Skills Index instrument

Braise a food
Bake in the oven
Seasoning a meat only using natural spices
Follow a simple recipe
Making a homemade tomato sauce, using only tomatoes and natural ingredients
Making homemade soup
Cooking beans in a pressure cooker
Grill a meat
Making a simple homemade cake
Prepare a lunch or dinner combining existing ingredients in the house and without the need for a recipe

This study followed all the guidelines of CNS resolution 466/2012 and was approved by the Ethics Research Committee of the Federal University of Health Sciences of Porto Alegre, under number 26137619.2.0000.5345. Participants were informed of the objectives of this study, the investigation methods, and minimal risks, and all of them signed the written informed consent form online.

RESULTS

We evaluated a total of 517 parent/children pairs. Parents were predominantly women and mothers (89.6%). The mean age of the children was 5.27 (± 2.36) years. Regarding food planning, mothers were responsible for buying food in 72.9% of the families, and in 80.5%, they were responsible for the preparation. Around half of the households had an income between 3-9 minimum wages (50.7%), considering the Brazilian minimum wage of R\$1,045.00 in 2020. Table 1 describes the socioeconomic and demographic characteristics of the sample.

Table 1. Socioeconomic and demographic characteristics of parents and childrens aged 2 to 9 years, Brazil, 2020 (n=517).

Variables	N(%)
<i>Adults characteristics</i>	
<i>Sex</i>	
Female	481(93)
Male	36 (7)
Age	36,44 (6.94)
<i>Occupation</i>	
With professional activity	406 (78.5)
Without professional activity	111(21.5)
<i>Marital status</i>	
Without a partner	78 (15.1)
With a partner	439 (84.9)
<i>Degree of kinship with the child</i>	
Mother	463 (89.6)
Father	37 (7.1)
Others	17 (3.4)
<i>Children characteristics</i>	
Age	5,27 (2.36)
<i>Sex (children)</i>	
Female	259 (50.1)
Male	258 (49.9)
<i>Family characteristics</i>	
Number of people living in the house	3,51 (1.01)
<i>Family Income</i>	
Until 2 minimum wages	71 (13.7)
3-9 minimum wages	262 (50.7)
≥ 10 minimum wages	184 (35.6)
<i>Responsible for food purchase</i>	
Mother	377(72.9)
Father	281(54.4)
Others	44(8.6)
<i>Responsible for food prepare</i>	
Mother	416(80.5)
Father	158(30.6)
Others	98(18.8)

Table 2 shows parents' level of confidence in their performance in each cooking skill. The total IHC score was 83.81 (± 18.22) points, ranging from 23.33 to 100.00. Regarding the confidence level in performing some skills, the item in which the largest number of parents felt very confident was "following a simple recipe," as opposed to "cooking beans in a pressure cooker," which was the skill in which the largest number felt "not confident..

Table 2. Degree of confidence of parents of children aged 2-9 years in performing cooking skills, Brazil, 2020 (n=517).

	Cooking skills confidence			
	Not confident N(%)	Little confident N(%)	Confident N(%)	Very confident N(%)
Braise a food	13 (2.5)	25 (4.8)	142 (27.5)	337 (65.2)
Bake in the oven	5 (1.0)	29 (5.6)	123 (23.8)	360 (69.6)
Seasoning a meat only using natural spices	27 (5.2)	71 (13.7)	125 (24.2)	294 (56.9)
Follow a simple recipe	1 (0.2)	18 (3.5)	105 (20.3)	393 (76.0)
Making a homemade tomato sauce, using only tomatoes and natural ingredients	31 (6.0)	73 (14.1)	102 (19.7)	311 (60.2)
Making homemade soup	19 (3.7)	56 (10.8)	114 (22.1)	328 (63.4)
Cooking beans in a pressure cooker	41 (7.9)	35 (6.8)	67 (13.0)	374 (72.3)
Grill a meat	20 (3.9)	49 (9.5)	128 (24.8)	320 (61.9)
Making a simple homemade cake	19 (3.7)	33 (6.4)	97 (18.8)	368 (71.2)
Prepare a lunch or dinner combining existing ingredients in the house and without the need for a recipe	11 (2.1)	28 (5.4)	113 (21.9)	365 (70.8)

Figure 1 shows the consumption frequency of in natura/minimally processed foods. Milk and/or yogurt showed the highest frequency of consumption (74.3%) in a 5 to 7 day period, and fresh fruit and/or fruit salad presented the second highest (62.5%). On the other hand, the group of foods that presented the lowest frequency of consumption (0 to 1 day a week) was raw salads (35%), legumes and vegetables (27.3%).

Figure 1. Frequency of weekly consumption of fresh and minimally processed foods by children aged 2 to 9 years, Brazil, 2020 (n=517).

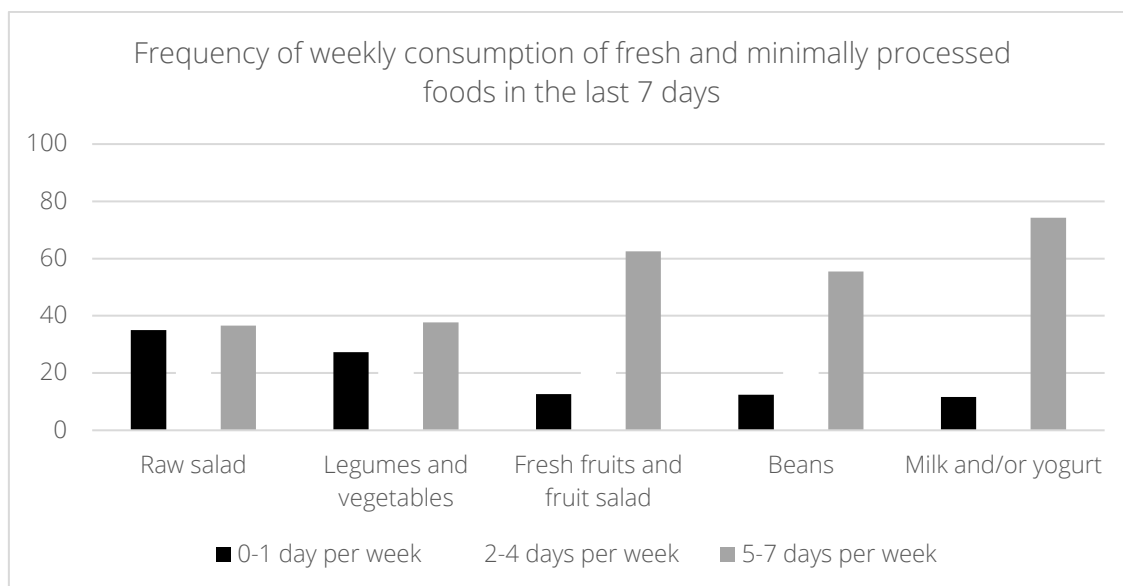


Table 3 shows the association between parents' confidence in their cooking skills and their children's food consumption frequency. Raw salads, legumes, and vegetables showed a statistically significant positive association with the parents' level of confidence in their cooking skills..

Table 3. Association of frequency of consumption of in natura/minimally processed foods by children aged 2 to 9 years with the degree of parents cooking skills, Brazil, 2020 (n=517).

	Cooking Skills	Valor de P
<i>Raw salad</i>		0.024
0-1 day per week	83.13 (18.06)	
2-4 days per week	81.20 (19.39)	
5-7 days per week	86.49 (16.81)	
<i>Legumes and vegetables</i>		0.002
0-1 day per week	80.50 (19.44)	
2-4 days per week	82.74 (19.47)	
5-7 days per week	87.20 (15.08)	
<i>Fresh fruits and/or fruit salad</i>		0.071
0-1 day per week	80.67 (18.71)	
2-4 days per week	81.91 (18.91)	
5-7 days per week	85.20 (17.57)	
<i>Beans</i>		0.243
0-1 day per week	80.52 (19.03)	
2-4 days per week	85.00 (17.09)	
5-7 days per week	83.86 (18.45)	
<i>Milk and/or yogurt</i>		0.58
0-1 day per week	84.22 (16.44)	
2-4 days per week	85.75 (16.07)	
5-7 days per week	83.38 (18.73)	

DISCUSSION

This study assessed the association between parents' cooking skills and the frequency of fresh/minimally processed foods consumed by their children (2-9 years old) during the Covid-19 pandemic. The findings show a higher frequency of consumption of milk and/or yogurt and fresh fruit and/or fruit salad. Parents' level of confidence in their cooking skills was associated with a higher frequency of their children's consumption of vegetables and/or cooked legumes and raw salads.

Regarding family organization related to food, a study investigating parents' cooking skills and their children's food consumption in the private school system in São Paulo, conducted with a sample similar to the present study, also showed greater participation of mothers in food-related tasks.⁶ These findings highlight the prior knowledge about gender inequality in the country, given that women predominately perform domestic work.¹⁰

The present paper suggests the importance of discussing the inclusion of men in the division of household chores, as it is possible that maternal overload, accentuated by the current pandemic scenario, impacts the decisions to purchase processed and ultra-processed foods due to questions related to preparation time and willingness to cook every day. The participation of fathers in planning and organizing their children's meals can be decisive for the family's eating behavior.

Regarding the total cooking skills index, parents showed a high level of confidence in their performance in each skill. This result was also found in another study with a similar sample that showed a total HCI of 78.8%.⁶ A greater number of individuals reported a lack of confidence in cooking beans in a pressure cooker and making a homemade tomato sauce with only tomatoes and natural ingredients. As for the preparation of beans, one of the aspects that can influence the lack of confidence is the need to use a pressure cooker, a relatively more complex appliance that requires certain skills and is often associated with domestic accidents. Concerning tomato sauce, a possible explanation is the lack of knowledge about preparing a homemade sauce. In addition, the wide availability of this type of sauce at supermarkets hampers individuals to prepare it at home. However, it is worth mentioning that some of these ready-made sauces are considered ultra-processed products and should be avoided.

The present study found insufficient consumption of fresh and minimally processed foods, corroborating with the National Adolescent School-based Health Survey (Pense) in 2016.¹¹ Fresh and minimally processed foods should be the basis of healthy eating and incorporated into daily meals. In addition, they provide vitamins and minerals that are essential for intestinal regulation and promote satiety.^{5,12} The daily consumption of fresh/minimally processed foods prevents obesity and chronic non-communicable diseases in adolescence and adulthood.^{13,14} However, parents in our study reported a low consumption of vegetables, supporting the findings of a previous study carried out with 640 children at preschool age, which showed that 56% did not consume any vegetables.¹⁵ In addition, another study carried out with school-aged children showed greater consumption of beans, milk and/or yogurts and fresh fruits or fruit salads rather than vegetables, the group with the lowest frequency of consumption.¹⁶

Children's food consumption in this and other studies is associated with the increase, in recent decades, in the offer of ultra-processed foods, which are industrial formulations that require little if any preparation before consumption.¹⁷ High consumption of these foods is harmful to health from a nutritional point of view,^{18,19} and it is associated with lower consumption of in natura/minimally processed foods.²⁰

The present study found a significant association between the ICH and the consumption of raw salads and vegetables. This result supports the fact that cooking skills are important for consuming foods that need preparation, such as salads and vegetables, unlike milk or yogurt, which are ready-to-eat products, and fruits that only need peeling. Preparing beans, which involves more steps and the use of a pressure cooker, was the skill in which a greater number of adults reported a lack of confidence to perform; nevertheless, no significant association was found between preparing beans and consumption.

A hypothesis for this result may be that beans are part of the Brazilian culture, and it is one of the most consumed meals in the country.²¹ Individuals prepare beans even after reporting a lack of confidence and try to find other strategies to consume this type of pulse, such as buying the ready-to-eat product in supermarkets or restaurants.

A study that used interventions to improve cooking skills did not find improvements in children's eating behavior after the educational intervention.⁶ However, other studies that evaluated the impact of cooking skills on children's food consumption showed an increase in the consumption frequency of fruits and vegetables after educational interventions. Although these studies did not use control groups and used small samples,^{22,23} results may encourage more in-depth studies on the subject.

CONCLUSION

The findings of this study indicate the essential role parents cooking skills play in the quality of their children's food intake. Our results also highlight the relevance of actions targeting the development of these skills and how to investigate determinant factors and the influence of improving cooking skills. Past studies have evidenced the positive relationship between preparing meals at home and healthy eating behaviors, including higher consumption of fruits, legumes, and vegetables.²⁴⁻²⁶ Among these aspects, we highlight time management and nutritional education regarding the publicity of ultra-processed foods.⁵

We have devised a cross-section study using an online questionnaire without training an interviewer. However, we tested the questions with other individuals before collecting data to minimize either possible interpretation problems or mistakes when filling in the questionnaires.

In addition, parents and guardians who participated in our study present high schooling levels, which may have contributed to the accurate interpretation of questions. Results from a sample representing participants from high income and schooling levels may not reflect the reality of families from lower socioeconomic conditions.

This study is the first step towards investigating the association of cooking skills, according to the Dietary Guidelines for the Brazilian population, with children's eating habits using a validated questionnaire to assess the main outcome.

To sum up, our study evidenced parents cooking skills as factors that may influence children's consumption of in natura/ minimally processed foods. Despite other determining cooking issues, establishing trust during the preparation of meals is a crucial stage to put this habit into practice.

This paper has highlighted the importance of developing culinary skills in a trusting environment, engaging children from an early age, always respecting the child's developing stages using purchasing and preparing food activities aiming at passing these cooking skills, and healthy eating habits on to the next generations. Our findings reinforce the promotion of educational actions to develop cooking skills to promote healthy eating habits.

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Contributors

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