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Is the lack of culinary skills an obstacle for teenagers to eat healthy?

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Abstract

The development of culinary skills has been identified as an important factor associated with better food quality, and the reduction in the transmission of these skills between generations has favored a greater consumption of ultra-processed products. However, there is still a lack of studies that assess the culinary skills of the Brazilian population, and it is noteworthy that, so far, no studies have been found in Brazil that have evaluated such skills in adolescents. The aim of this study was to evaluate the association between self-perceived culinary skills and the quality of food consumption in adolescents. This is a cross-sectional study with adolescents from public schools in Itaqui, RS. Demographic and socioeconomic variables, self-perceived cooking skills, and weekly frequency of 22 food items were investigated, which gave rise to the food consumption quality index. Means (SD) of the food consumption quality index, according to self-perceived cooking skills, were calculated for the entire sample and stratified by sex, using ANOVA or Mann-Whitney test. The 95%CI was calculated, and the significance level considered was 5%. Higher means (SD) of the food consumption quality index were observed among female adolescents who reported knowing how to "choose foods" [59.99 (9.43)] (p=0.027), "seasoning" [60, 53 (9.58)] (p=0.0109), and "combining ingredients or preparations" [61.14 (9.64)] (p=0.0051). Among males, the highest mean (SD) of the food consumption quality index was observed among adolescents who reported knowing how to "wash, peel, cut or measure ingredients" [(62.16 (10.69)] (p=0.0012). Furthermore, there was a positive association between the index of food consumption quality and the number of self-perceived culinary skills in females (p trend =0.003). This study showed that a greater number of self-perceived culiunary skills may be associated with better quality in adolescent food consumption.

Keywords: Health Promotion. Cooking. Food Consumption. Food guides.

INTRODUCTION

Population-based research carried out in Brazil has identified that the diet of adolescents has been marked by the high consumption of ultra-processed foods and the low consumption of in natura and minimally processed foods[1,2]. This inadequate food consumption, combined with other aspects of lifestyle, has been widely associated with unwanted health outcomes, such as excessive weight and chronic non-communicable diseases (CNCDs), both in Brazilian adolescents and adults[3]. Among the coping strategies for the current scenario, the Food Guide for the Brazilian Population (FGPB)[4] stands out as an instrument of food and nutrition education that is in line with the guideline for promoting adequate and healthy food and is part of both the National Policy on Food and Nutrition[5] and the National Health

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Promotion Policy[6].

The FGBP provides the population with information on adequate dietary practices, introducing the importance of developing and sharing culinary skills, with a view to promoting health with autonomy[4]. In Brazil, as in other countries, there has been a decrease in the transmission of knowledge about cooking between generations, which ends up favoring the consumption of ultra-processed foods[4], considered more practical, as they are generally ready for consumption. Better levels of cooking skills, such as attitudes and confidence in food preparation or the frequency of preparing meals at home, can contribute to healthy eating habits, especially concerning increased consumption of vegetables and fruits[7-9]. However, there is still a lack of studies that assess the culinary skills of the Brazilian population, and it is noteworthy that, so far, no studies have been found in Brazil that have evaluated such skills in adolescents.

The relationship between culinary skills and healthy eating started to be explored recently; however, there is no record of any study addressing this subject in Rio Grande do Sul. In order to contribute to the expansion of knowledge in this area, the objective of the present investigation was to verify the association between self-perceived cooking skills and the quality of food consumption among adolescents.

METHODOLOGY

Study design and eligibility

This is a study with an observational, cross-sectional, school-based analytical character, with data from a larger study entitled "Factors associated with food consumption of adolescents in the municipal elementary school network of a city in the West Frontier of Rio Grande do Sul". Students regularly enrolled from the 6th to the 9th grade in the city public school system in the urban area of Itaqui, RS in the year 2019 and who were present on the day of data collection were included in the study. For questions about food, adolescents who were pregnant, breastfeeding or who had had a child up to a maximum of six months were excluded, in addition to all adolescents who, for some health reason, had changed their diet in the week prior the interview.

Sample size calculation

The sample size calculation was performed with the help of the OpenEpi® 3.03 statistical program. The population size was estimated at 526 students, considering data provided by the Department of Education of Itaqui, RS concerning the number of students enrolled from the 6th to the 9th grade in city schools in the urban area in 2019; the hypothetical frequency of the outcome factor in the population estimated at 50% given the lack of knowledge of the prevalence of some outcomes in the population; an acceptable error of 5 percentage points; a 95% confidence interval; and a design effect of 1.0. The resulting sample size was 223 individuals; after adding 20% for losses and refusals, the final sample needed to meet the objectives of this study was 268 individuals (50.95% of the total number of students). The sampling procedure was then carried out in each of the four city elementary schools in the urban area of Itaqui, RS selected among the six existing ones. As this population tends to demonstrate low adherence to studies, all students of each grade in each school were

invited to participate.

Instrument

Data collection was carried out through interviews, using a questionnaire prepared by the researchers themselves.

Study variables

The demographic variables included were sex and age (pre-adolescent - 10 to 14 years old/adolescent - 15 to 18 years old), and the socioeconomic variables were: mother's schooling (years of study) and economic class, defined based on the Economic Classification Criteria of Brazil (www.abep.org).

Culinary skills were investigated based on the following questions: "Considering the preparation of a meal, what do you know about how to: a) Choose foods?; b) Wash, peel, cut or measure ingredients?; c) Seasoning?; d) Cook?; e) Combine ingredients or preparations?; f) Arrange the food to be served?". All questions had the answer option: "Yes" or "No". To ensure that the desired information about knowing how to cook was obtained, the following question was also asked: "Do you know how to prepare something in the kitchen?" with the answer options "Yes" or "No"; when the answer was "Yes", the following open question was asked: "What do you know how to prepare?".

The frequency of consumption of 22 food items, 11 fresh and minimally processed foods and 11 ultra-processed foods, was investigated in the seven days prior to the interview. The choice of these foods was based on the examples cited in FGBP4 for each processing category, namely:

- In natura or minimally processed: rice (any type); chilled or frozen fresh meats (cattle, poultry, pork, fish, etc.); fresh fruit; vegetables (tomatoes, carrots, beets, zucchini, etc.); legumes (beans of all kinds, lentils, chickpeas, etc.); milk, powdered milk or yogurts with no added sugar; fresh or dry pasta made with mandioca, corn or wheat flour; eggs; roots and tubers (potatoes, cassava, etc.); fruit juices with no added sugar; and vegetables (kale, lettuce, spinach, arugula, etc.).

- Ultra-processed foods: chocolate milk; candies, chocolates and sweets in general; cookies (any kind); cakes or cake mixes; sausages (sausage, ham, bologna, etc.); yogurts and sweetened and flavored dairy drinks; breads and baked goods (industrialized); soft drinks; packet snacks; "instant" soups, noodles and seasonings; and sweetened and flavored juices.

Food consumption was evaluated by obtaining a quality index; firstly, the consumption frequencies of each of the 11 ultra-processed items were inverted: those with consumption equal to 7x/week, for example, started to be considered 0x/week, and vice versa. Then, the index was calculated from the sum of the frequencies of each of the 22 food items, so that the greater the frequency of consumption of fresh and minimally processed foods, and the lower the frequency of consumption of ultra-processed foods, the greater the index score would be; which could then range from 0 to 154 points per participant. To facilitate the interpretation of the food consumption quality index, it was converted to a scale from 0 to 100 points.

Quality control

Quality control was performed with 31 individuals (13.9% of the sample), for whom the question "Do you know how to prepare something in the kitchen?" was repeated. The result of the kappa test to assess the agreement and/or repeatability of the question was 1.00, considered excellent.

Fieldwork logistics

The fieldwork was carried out from June to

July 2019. The project coordination committee met the classes to explain the study and invite the students, delivering the Informed Consent Form - ICF and the Minor's Assent Form – MAF. On the day of collection, students with both signed forms were then called for the interview, which was carried out individually in a private room.

Statistical analysis of data

The collected data were reviewed and double-typed into the EpiData 3.1 program by two trained students. The typing validation was then performed, and then the data were exported to the Stata 12.1 program for statistical analysis. Demographic and socioeconomic characteristics of the sample, as well as the most commonly performed preparations, were presented through proportions and respective 95%CI. The prevalence of self-perceived cooking skills was calculated according to demographic and socioeconomic variables, and the chi-square test of heterogeneity was used to verify the existence of associations. Furthermore, the averages (SD) of the food consumption quality index were calculated, according to self-perceived cooking skills, considering the total sample and stratified by sex. For these analyses, the normality and homogeneity of the variance of the continuous variable were previously tested, and the ANOVA test (continuous variable with normal distribution) or Mann-Whitney (continuous variable with asymmetric distribution) was used to verify the existence of associations. Furthermore, the existence of a linear trend was also verified. The level of significance considered in all analyzes was 5%.

Ethical aspects

This work was approved by the Research Ethics Committee of the Federal University Foundation of Pampa (Opinion No. 3.521.164) and the interviews were carried out only with adolescents who had signed the ICF and MAF. At all stages of the study, compliance with the requirements set out in Resolution No. 466/2012 of the National Health Council, which regulates the development of research involving human beings, was assured.

RESULTS

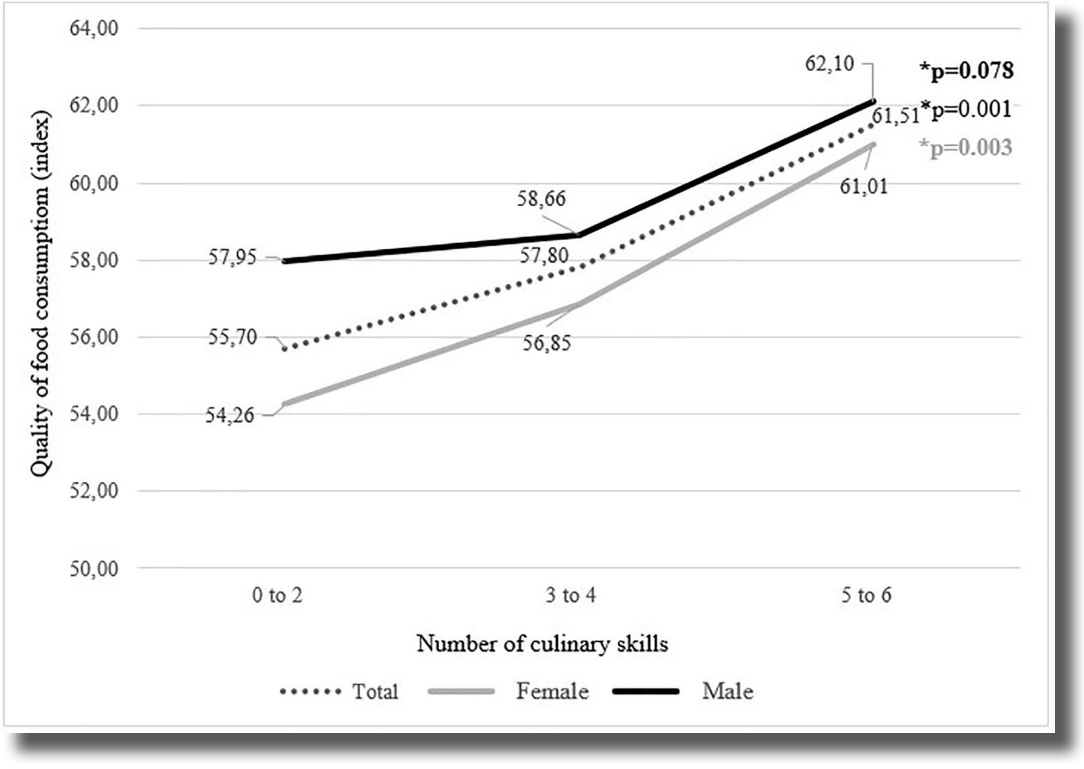
The sample consisted of 223 adolescents, 56.36% were female and 72.20% were pre-adolescents, with a mean age (±standard deviation) of 13.59 (±1.44) years old, ranging from 10 to 18 years. Most students belonged to economic class C (56.25%) and had mothers with up to 4 years of schooling (59.6%) (Table 1).

The most prevalent cooking skills in the present study sample were: knowing how to wash, peel, cut or measure ingredients (82.96%), knowing how to choose food (81.17%), and knowing how to arrange food to serve (81.17%). Statistically significant differences were observed only for the mother's sex and education. The proportion of female adolescents (88.24%) who reported knowing how to wash, peel, cut, or measure ingredients was higher than that of males (76.92%) (p=0.025). In addition, the proportion of adolescents whose mothers had 5 to 11 years of education (95.35%) who reported knowing how to arrange food for serving was significantly higher than those whose mothers had 0 to 4 years of schooling (76.61). %) and ≥ 12 years of study (75.61%) (p=0.020) (Table 2). When asked “do you know how to prepare

something in the kitchen?", 189 (84.75%) students answered that they were capable. Of these, rice (82.01%) was mentioned as the main food that adolescents were able to prepare, followed by beans (52.91%), pasta (46.68%), meat (34.92%), and wagoner's rice (29.63%) (data not shown).

Table 3 presents the quality of total food consumption and stratified by sex of adolescents in the sample, according to self-perceived cooking skills. The culinary skills "knowing how to choose food", "knowing how to wash, peel, cut or measure ingredients", and "knowing how to combine ingredients or preparations" showed statistically higher averages of the food consumption quality index than those who perceived not having such skills. For females, the averages of the food consumption quality index were higher among those who reported having the skills "knowing how to choose food", "knowing how to season it", and "knowing how to combine ingredients or preparations". For males, it was found that those who reported knowing how to "wash, peel, cut or measure ingredients" had a statistically higher mean food consumption quality index compared to those who reported not having this skill.

When evaluating the amount of cooking skills self-perceived by the study participants, 98.2% of the sample reported having at least one of the six cooking skills investigated (data not shown). Furthermore, a higher mean (SD) of the food consumption quality index was observed as the number of self-perceived cooking skills by female participants increased, from 54.26 (6.98) among those with up to two skills to 61.01 (9.62) among those who acknowledged having five to six cooking skills (p=0.003) (Figure 1).



*p of linear trend

Figure 1 - Quality of food consumption of adolescents from 6th to 9th grade in city schools, according to the number of self-perceived cooking skills, according to sex. Itaqui, RS, 2019 (n=223).

Table 1 - Demographic and socioeconomic characteristics of adolescents from 6th to 9th grade in city schools. Itaqui, RS, 2019 (n=223).

Variables	n	% (95%CI)
Sex		
Female	119	53.4 (46.8-60.0)
Male	104	46.6 (40.0-53.2)
Age (years)		
10 to 14	161	72.2 (66.3-78.1)
15 to 18	62	27.8 (21.9-33.7)
Mother's education (years of study)		
0 to 4	124	59.6 (52.9-66.3)
5 to 11	43	20.7 (15.1-26.2)
12 or more	41	19.7 (14.3-25.2)
Economic class		
Class A	2	1.0 (00.4-02.5)
Class B	28	14.6 (00.9-19.6)
Class C	108	56.3 (49.2 -63.3)
Class D-E	54	28.1 (21.7-34.5)

Table 2 - Prevalence of self-perceived cooking skills among adolescents from the 6th to the 9th grade of city schools, according to demographic and socioeconomic variables. Itaqui, RS, 2019 (n=223).

Demographic and socioeconomic variables	Culinary skills					
	Choose the foods	Wash, peel, cut or measure ingredients	Season	Cook	Combine ingredients or preparations	Arrange the food for serving
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Sex	*p=0.887**	***p=0.025****	*p=0.489**	*p=0.457**	*p=0.950**	*p=0.840**
Female	97 (81.5)	105 (88.2)	76 (83.7)	91 (76.5)	60 (50.4)	96 (80.67)
Male	84 (80.8)	80 (76.9)	71 (38.3)	75 (72.1)	52 (50.0)	85 (81.7)
Age (years)	*p=0.306**	*p=0.070**	*p=0.106**	*p=0.527**	*p=0.733**	*p=0.902**
10 to 14	128 (79.5)	129 (80.1)	101 (62.73)	118 (73.3)	82 (50.9)	131 (81.4)
15 to 18	53 (85.5)	56 (90.3)	46 (74.2)	48 (77.4)	30 (48.4)	50 (80.7)
Mother's education (years of study)	*p=0.202**	*p=0.831**	*p=0.811**	*p=0.398**	*p=0.825**	***p=0.020****
0 to 4	98 (79.0)	101 (81.5)	78 (62.9)	91 (73.4)	61 (49.2)	95 (76.6)
5 to 11	39 (90.7)	36 (83.7)	27 (62.8)	29 (67.5)	23 (53.5)	41 (95.4)
12 or more	32 (78.1)	35 (85.3)	33 (80.5)	33 (80.5)	22 (53.7)	31 (75.6)
Economic class	*p=0.941**	*p=0.686**	*p=0.953**	*p=0.838**	*p=0.815**	*p=0.142**
Class A-B	25 (83.3)	24 (80.0)	19 (63.3)	21 (70.0)	16 (53.3)	26 (86.7)
Class C	87 (80.6)	90 (83.3)	71 (65.7)	80 (74.1)	54 (50.0)	88 (81.5)
Class D-E	44 (81.5)	47 (87.0)	36 (66.7)	41 (75.9)	25 (46.3)	38 (70.4)
Total	181 (81.2)	185 (83.0)	147 (65.9)	166 (74.4)	112 (50.2)	181 (81.2)

*Chi-square test for heterogeneity.

Table 3 - Quality of total food consumption and stratified by sex of adolescents from 6th to 9th grade of city schools, according to self-perceived cooking skills. Itaqui, RS, 2019.

	Food consumption quality index		
	Total (n=223)	Female (n=119)	Male (n=104)
Culinary skill	Mean (SD)	Mean (SD)	Mean (SD)
Choose the foods	***p=0.0081**** *F=7.14*	*p=0.0027** *F=9.44*	*p=0.3580** *F=0.85*
No	55.8 (9.4)	53.2 (6.7)	58.5 (11.0)
Yes	60.4 (9.9)	60.0 (9.4)	60.9 (10.4)
Wash, peel, cut or measure ingredients	***p=0.0005**** -	*p=0.0826** *F=3.07*	***p=0.0012**** -
No	54.3 (7.3)	54.3 (8.0)	54.3 (7.0)
Yes	60.5 (10.1)	59.3 (9.4)	62.2 (10.7)
Season	*p=0.1712** *F=1.89*	***p=0.0109**** *F=6.70*	*p=0.4748** *F=0.51*
No	58.3 (9.9)	55.9 (8.3)	61.6 (11.2)
Yes	60.2 (9.9)	60.5 (9.6)	59.9 (10.2)
Cook	*p=0.3822** F=0.77	*p=0.0627** F=3.54	*p=0.6609** F=0.19
No	58.5 (10.2)	55.8 (8.3)	61.2 (11.3)
Yes	59.9 (9.8)	59.7 (9.5)	60.2 (10.3)
Combine ingredients or preparations	***p=0.0010**** *F=11.06*	***p=0.0051**** *F=8.16*	*p=0.0604** *F=3.61*
No	57.3 (9.7)	56.2 (8.4)	58.4 (11.0)
Yes	61.7 (9.6)	61.1 (9.6)	62.5 (9.7)
Arrange the food for serving	*p=0.9555*** -	*p=0.7486** *F=0.10*	*p=0.6967*** -
No	59.2 (7.8)	58.2 (8.6)	60.5 (6.8)
Yes	59.6 (10.4)	58.9 (9.6)	60.4 (11.2)

*p value and F statistic of the ANOVA test; **P-value of the Mann-Whitney test.

DISCUSSION

The study of culinary skills in the field of food and nutrition is still recent, so no studies were found in Brazil that evaluated the prevalence of these skills among adolescents. Studies on this topic within the country review the concept of culinary skills[9], the development of an evaluation instrument[10,11], evaluation of an intervention program with Brazilian university students[12,13], evaluation of the culinary skills of elderly people who practice aquatic activities[14], development of cooking skills during the COVID-19 pandemic[15,16], and cooking practices of mothers[17].

When evaluating the association between the prevalence of self-perceived cooking skills and demographic and socioeconomic variables, the data indicate that being female is associated with the ability to "wash, peel, cut, or measure ingredients". This finding aligns with studies carried out with Portuguese[18] and American[19,20] adolescents, which show a higher proportion of female adoles-

cents involved in culinary preparations. Yet, a recent study[21] showed that more than half of the female participants reported that their families expected them to be cooking or at least helping to prepare meals and expressed that they acquired culinary skills much earlier than the opposite sex; among males, the majority reported having very limited cooking skills, if any. Current data[22] show that, in Brazil, domestic work continues to be an essentially female task and little shared with men, even when both work outside the home. Therefore, it is believed that the results of the present study can be attributed to a historical and cultural construction in which female children are taught and are more involved in the domestic culinary environment than male children, as it was before women were inserted into the labor market.

The present study identified a higher prevalence of the skill "arrange the food to serve" among participants whose mothers have 5 to 11 years of schooling. No studies were found that evaluated the association between maternal schooling and cooking skills among adolescents. However, the mother was considered the most common source for learning cooking skills among children and adolescents and learning from the mother is associated with greater confidence in the kitchen and a lower consumption of unhealthy foods by this public[7,23].

This study showed that both self-perception and the amount of cooking skills are associated with better quality of food consumption in adolescents. A cross-sectional study observed that learning cooking skills at a younger age is associated with many behaviors related to cooking, practice and food quality in adults[23]. The authors identified that participants who had cooking skills since childhood or adolescence consumed fried foods, chocolates, and snacks less frequently, and used more fresh foods and less ultra-processed products in their preparations, compared to participants who learned cooking skills only as adults. Also, adolescent participants who learned cooking skills at younger ages consumed significantly more fruit than adults[23].

In this context, a cohort including 31 public schools in Minneapolis, USA showed that adolescents who helped prepare food for dinner at least once or twice a week were more likely to engage in food preparation-related behaviors as young adults, how to buy fresh vegetables, write a shopping list, and prepare a full dinner for two or more people. Also, young adults who reported enjoying cooking were more likely to have been involved in food preparation in adolescence[24].

The results of this study are also corroborated by studies that observed higher consumption of fruits and vegetables and nutrient intake by adolescents who were involved in food preparation in the previous week[20], and lower consumption of soft drinks and fried foods among adolescents who knew how to prepare food[19]. Such data demonstrate that the involvement of adolescents in food preparation is related to better food quality and healthier food choices.

An international study carried out with young people participating in a culinary intervention program showed that those who reported greater involvement in preparing a meal were more likely to have better food quality[25]. In a study carried out in Alberta, Canada with 5th grade students, it was observed that a higher frequency of involvement in the preparation of meals was associated with higher scores on the diet quality index[26].

The stratified analysis also showed that better quality in food consumption was associated with the amount of self-perceived cooking skills in both sexes, with three times more associated skills for females. A study

carried out with adolescents from public schools in Minneapolis, USA observed that knowing how to prepare food was associated with lower intake of carbonated beverages among female adolescents and lower intake of fried foods among male adolescents[19]. A cross-sectional study carried out with Swiss adults showed that women had more culinary skills in all age groups and greater pleasure in cooking. In addition, women reported higher weekly consumption of fruits and vegetables, while men on average had higher frequencies of consumption of sweetened beverages, meats, and ready-to-eat foods[27].

Some limitations and strengths of the study should be considered. As it is a cross-sectional study, it is not possible to establish a causal relationship between the variables examined. However, this appears to be the first school-based study that analyzed the relationship between self-perceived cooking skills and the quality of food consumption in a representative sample of adolescents. It is also noteworthy that the instrument used to assess culinary skills is not validated; however, no validated questionnaire on the subject was found in the literature for the target population of this research. On the other hand, the team of interviewers received rigorous training to standardize the application of the questionnaire, reducing the chance of bias. In addition, the participants had the possibility to mention which meals they knew how to make in the kitchen, noting that the adolescents know how to make elaborate meals that are part of the Brazilian diet. This may mean that a favorable context exists for carrying out interventions aimed at improving and increasing confidence in cooking activities among adolescents.

The findings of this study underscore the importance of transferring and teaching cooking skills as a tool for promoting healthy food choices among adolescents, corroborating the FGBP[4] recommendation that not having or having few cooking skills is an obstacle to adopting a healthy diet. Since adolescence is considered a formative period, in which long-term eating behaviors can be adopted and maintained[28], it is extremely important that adolescents learn cooking skills from an early age so that healthy eating habits are acquired and maintained over time. It is recommended, whenever possible, to practice and develop these skills more and more, sharing and exchanging culinary knowledge, thus valuing the act of cooking. It is important that schools carry out actions aimed at healthy food consumption, including activities that involve culinary practices that encourage both sexes to get involved in the process.

CONCLUSION

The results of this study indicate that most of the investigated adolescents have at least one self-perceived cooking skill and know how to make elaborate preparations that are part of the Brazilian eating habits. It was also identified that being female and having a mother with 5 to 11 years of study are related to greater self-perception of cooking skills. Furthermore, this study showed that both having cooking skills and the amount of self-perceived cooking skills are associated with better quality in the food consumed by these adolescents.

Author statement CRediT

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All authors read and agreed with the published version of the manuscript.

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