

# MATERNAL INFLUENCE AND CONSUMPTION OF PROCESSED FOODS AMONGST ADOLESCENTS

Chetna, Vidhu Yadav\*, Harmeet Kaur

Department of Food and Nutrition & Food Technology

Institute of Home Economics, University of Delhi

\*Corresponding Author

## Abstract

The present cross-sectional study was conducted in Delhi-NCR among the adolescents aged 13-18 years. The results highlighted that the majority of the adolescents (80.9%) consume food from outside atleast twice a week. Around 80-90% adolescents consume ultra-processed foods and soft drinks and a lesser percentage preferred sweet foods. Majority(80.5%) of the adolescents prefer eating outside when mothers are not at home. Majority (94.5%) of the mothers used encouraging statements to enhance the consumption of healthy foods. Furthermore, a small portion (17%) of the mothers always talked to their children in concern of their eating habits and few (11%) of mothers never talked to their child regarding their eating habits. A weak though positive and statistically significant correlation ( $p < 0.005$ ) highlight that mothers have an impact on eating habits of adolescents.

**Keywords:** Adolescents, processed foods, eating behaviour, parenting style

## Introduction

Adolescents are novel populace with explicit well-being concerns and needs. They belong to an age group when an individual takes the responsibility of his/her health, beliefs and food-related behaviours that might affect the future. Physical, social and sexual changes make adolescents over-burdened with pressure, which can bring about tension, withdrawal, hostility, incompetent aptitudes and real physical sickness. Food-related practices are especially significant during these years since dietary patterns created at this stage usually proceed into adulthood. Their dietary patterns are generally described by continuous eating, skipping suppers, lousy nourishment utilization and reliably low intake of milk, fruits and vegetables and more dependence on ultra-processed foods. In the modern world, the food choices of teenagers are changing because of their occupied lifestyle such as academic stress, social media handling, outside eating, irregular sleep patterns and so on so forth (Mitchell et al., 2013).

Many adolescents use various forms of technology late into the night, and at the same time, they consume caffeinated beverages (Calamaro et al., 2009). As a result the high intake of caffeine increase irregularity in the sleep cycle of the adolescent which not only affects the efficiency of their work but also affects the tendency to do work in

daytime (Calamaro et al. 2009). Watching television excessively, increases weight both by the reduction in physical activity of the children and due to encouragement of poor eating habits of children by exposing them to unhealthy food advertisements (Lindsay et al., 2006). According to Bassett et al. (2008), as children become more established and as they focus less on family and more on school, peers, and distinctive media, parental impact melts away. As adolescents, children invest progressively more time away from home, they involve themselves in such environments that encourage them to take more meals outside and have more prominent options in their own eating routine and physical exercise.

Parenting involves “the task of care and feeding one’s children” (Savage et al., 2007). The creation of the food environment at home and continuous encouragement to make healthy food choices are important roles that parents play for health of their children (Boutelle et al., 2007). During meal time, the likelihood of poor intake of healthy foods like fruits, vegetables and dairy items can be lowered by ensuring presence of anyone of the parents; it also has an association with lowering the risk of skipping breakfast among adolescents (Rhee, 2009). However, another study by Fisher et al. (2002) indicated that parental pressure on child to eat fruit and vegetables discourages intake among young girls. Adolescents follow autonomy over parental food choices, however, at dinner time they have to eat food that is prepared by their mother, thus no choice over food (Bassett et al., 2008). In the moderately controlled food choices in families, for example, instructing, restricting, emphasizing, etc., adolescents set up their strategies during the meals and turn out to be independent and settle upon their own food choices. Healthy eating habits in adolescents can be encouraged by involvement of parents in preparation of meal and their instructions for meals of the family (Hannon et al., 2003). The adolescents also trouble parents for unhealthy food, persuade and manipulate, bargain and negotiate, use emotion and effect decisions of parents in purchasing (Bassett et al., 2008).

Generally, the responsibility for the upbringing of the child is played by mother. Therefore, the influence of the mother may affect her children. When a working mother grows her child, there are several factors which affect the children lifestyle and his or her eating behaviour. Though, the mother’s education level also shows the relationship with the eating habits of young children (Vereecken, 2004). A mother has an influence on eating behavior of the child from conception to childhood. There are shreds of evidences that the foods that mother choose during pregnancy impacts the acceptance by an infant later on. For infants, it is the amniotic fluid that serves as a major source of sensory exposure (Savage et al., 2007) as during fetal life, the senses like taste and smell are already working. The initial experience of these senses occurs even before birth owing to swallowing of the amniotic fluid by the fetus (Savage et al., 2007). This exposure of flavors through amniotic fluid also has an influence on the acceptance of flavors after the birth of infants (Schaal, 2000). During infancy,

breastfeeding is an important task done by mothers; it is an optimal feeding method for 6 to 24 months infants (Savage et al., 2007). During first six months, only mother's milk is given to the child for the reason that mother's milk has the tendency to increase the innate immunity of the child. Breastfeeding for first six months followed by the addition of solid food that is known as 'complementary feeding'. Through complementary feeding, infants start moving to an altered pattern of meal, also start consuming the diet that their family or culture provide them (Savage et al., 2007). As the children reach childhood stage, they are very well aware about their likes and dislikes and associate with flavors of food socially and also understand physiological effect of consumption

Processed foods are defined as foods which are not a raw agricultural commodity. These include varied foods ranging from frozen, canned and dried foods, whole wheat bread, prepared meals, confectionery and carbonated beverages (Popkin, 2020). As per the NOVA classification, foods are divided into 3 groups- Unprocessed and minimally processed foods, processed culinary or food industry ingredients and Ultra-processed food products (Monteiro et al., 2010). High consumption of these ultra-processed food may lead to obesity.

A mother plays a significant role since childhood and has an influence on the food preferences of the child. The eating habits of a child are affected by both - level of control and level of permission. Several studies have assessed the influence of parents on food habits of young children. Very few studies are available on influence of parenting practices on food choices by adolescents. The present study has explored the role of mothers in deciding the eating behavior of adolescents.

## METHODOLOGY

The present study was planned to gather data on Socio-demographic and eating habits and behaviour of the mothers and adolescents.

### Study design

The present cross-sectional exploratory study was carried out by conducting an online survey that involved 36 mother-child (adolescent) pairs residing in Delhi-NCR.

### Locale of the study

The present study was carried out in urban households of Delhi-NCR. Mother-child (adolescent) dyads from the same household were enrolled for the study.

### Sample size

The sample size was 36 dyads (mother-child dyad) taking 90% as the confidence interval and 10 % as the margin of error.

### Sample selection

In this study, the pairs of mother and child (adolescent) were selected from the same household to minimize the confounding factors.

### Inclusion criteria

- **For adolescents**
  - Willing subjects
  - Adolescents between 13-18 years comprising both boys and girls
  - Adolescent should be staying with his/her mother
- **For parents - Mother**
  - Willing subjects

### Exclusion criteria

- **For adolescents**
  - The adolescent who stays alone
- **For parents - Mother**
  - Mothers of children aged less than 13 years

### Tools and Techniques for data collection

Keeping in mind the objectives of the study, the following tools and techniques were used for data collection. Separate questionnaires were prepared for mother and adolescent.

### Questionnaire

The questionnaires were filled through google online forms.

For Adolescents

- ✓ Socio-demographic profile: Adolescents were asked about their age, gender, educational qualification, occupation, and residential address.
- ✓ Dietary habits and food patterns: It included meal pattern, skipping meal, eating outside,
- ✓ Consumption of different types of food: This includes consumption of fruits, fried foods, ultra-processed foods, soft drinks and sweet foods.
- ✓ Eating habits of adolescents: Questions based on frequency of consumption outside foods and different types of food and effect of presence or absence of the mother on consumption of such foods.
- ✓ Perception of adolescents on influence of mother on eating habits of mothers.

For Mothers

- ✓ Socio demographic profile: Mothers were asked about their age, educational qualification, occupation, residential address and family monthly income.
- ✓ Question concerned to adolescent's feeding pattern with family and choices of food.
- ✓ Eating habits of mothers: It included consumption of different types of food.

- ✓ Strategies made by mothers: It included question based on different strategies like building pressure, reward, praising the child, etc.
- ✓ Perception regarding maternal influence on eating habits of children.

### Data collection

The questionnaire was pretested on 5 dyads on the basis of inclusion and exclusion criteria. These subjects were not included in the final sample of the study. After analyzing the responses elicited during pretesting, the questionnaire was suitably modified.

### Data analysis

The information obtained from the subjects was consolidated systematically and transformed scientifically into MS Excel sheet. The data was then subjected to quantitative and qualitative analysis. The frequency and percentages were calculated for all the gathered information. Pearson's correlation was used to correlate the scores of mothers and adolescents. SPSS (Statistical Package for Social Sciences) version 21 was used for the data analysis.

## Results

### Socio-demographic characteristics

The background characteristics of the study population are presented in Table 1. The mean age of the adolescents was  $15.8 \pm 1.09$  years, majorly comprising of girls (69.2%, n=25). The majority of the adolescents were in the age group 15-16 years (63.9%), attending school (91.7%) and having a monthly family income between Rs. 1-3 lakh.

Information related to maternal characteristics highlights that the mean age of the mothers was  $46.3 \pm 6.3$  years wherein half of the mothers were in the age group of 35-40 years (50%) followed by 40-45 years (27.8%). Regarding education, almost an equal number of mothers were graduates (36.1%) and intermediates (36.1%). Data related to occupation revealed that three-fourths of the mothers were homemakers (75%).

**Table 1: Socio-demographic characteristics of the subjects**

Adolescents profile (n=36)	
Age (years)	
13-14 years	4(11.1)
15-16 years	23(63.9)
17-18 years	9(25)
Gender	
Male	11(30.5)
Female	25(69.4)

Total	36(100)
<b>Occupation</b>	
School student	33(91.7)
College student	3(8.3)
Working	0(0)
<b>Educational Qualification</b>	
Class 9 <sup>th</sup> or 10 <sup>th</sup>	9(25)
Class 11 <sup>th</sup> or 12 <sup>th</sup>	24(66.7)
College first year	2(5.6)
College second year	1(2.7)
<b>Monthly household income (Rs.)</b>	
Above 5 lakh	1(2.8)
3 lakh-5 lakh	12(33.3)
1 lakh-3 lakh	15(41.6)
Below 1 lakh	8(22.2)
<b>Mothers profile(n=36)</b>	
<b>Mother's Age (years)</b>	
<35	1(2.8)
35>40	18(50)
40>45	10(27.8)
45>50	7(19.4)
<b>Mother's Education</b>	
Post-graduation or professional degree	2(5.5)
Graduation	13(36.1)
Intermediate (Passed Class 12)	13(36.1)
Matric (Passed class 10)	6(16.6)
literate but less than class 10th	2(5.5)
<b>Mother's Occupation</b>	
Working	9(25)
Homemaker	27(75)

Figures in parentheses represent percentages

#### **Dietary habits and eating patterns:**

The study revealed that all adolescent boys and girls consumed 3-5 meals daily. As far as skipping meals was concerned it was noted that 16.6% of the subjects regularly skipped at least one meal in a day, the reasons being indulgence in electronic gadgets (TV, mobiles), followed by study workload, laziness while others being not hungry, parents not at home, etc.

It was observed that more than half (66.6%) of the adolescents ate their daily meals with their mothers or family, and most of these subjects had mothers who were homemakers (79%) thus, highlighting that eating meals with mothers varied in each household concerning their mother's occupation.

### **Eating out behaviour and Consumption of ultra-processed foods:**

The majority of the adolescents (80.9%) stated that they consume outside food, consuming it at least twice a week while 34.4% consumed it at least thrice a week. Eating out preferences varied among adolescent boys and girls wherein, despite the fact that almost half of the adolescents affirmed that they opt for healthy food options while eating out, consumption of ultra-processed foods, foods high in salt, sugar and fat was high.

The most favourite of these foods were chips and wafers, soft drinks and fried foods/snacks reasons being economical and handy. Though a majority of these adolescents (60 %) consumed these ultra-processed foods in front of their mothers, few reported being restrained and controlling themselves when their mothers were around. 19.4% of subjects mostly purchased food from outside and preferred eating snacks when hungry.

### **Mothers' parenting style and practices towards the eating habits of their children:**

While cooking meals, 86.1% of mothers consider their child's preferences for day's meals. Mothers did encourage children to eat healthy food and they adopted different strategies. As per data, the two main strategies were praising the child for eating healthy food (86.1%) and building pressure on a child (77.8%) to eat healthily, others being encouragement through negotiation (77.7%) and using rewards to encourage the child to healthy, (86.1%).

The majority (94.5%) of the mothers used encouraging statements to enhance the consumption of healthy foods, particularly fruits and vegetables for which they used encouraging statements like "Fruits are good for you", "They will keep you away from illness", "These will make you healthy", etc. whereas in order to reduce the consumption of unhealthy foods that is, foods high in sugar, salt and fat, 41.7% of the mothers used discouraging statements like - "Sweets are bad for teeth", "Sweets can make them fat", etc. More than half of the mothers (57.1 %) ascertained that they restrained themselves when they consume ultra-processed food in the presence of their children as they didn't consider them to be healthy. When asked how they encourage their child to eat food which he/she dislikes most of them (67.8%) said they insisted their child taste at least even if he/she doesn't like something whereas 46.4% of mothers agreed that they ask the child only to eat a small portion.

As far as mothers' control over their children regarding eating out and food choices were concerned it's evident, that mothers did not have any strict control relating to giving permission to their children to eat out their choice of food as the majority of

the mothers frequently allowed their children to eat outside food whenever he/she wants including ultra-processed foods

### **Distribution of the subjects based on the perception of the relationship between maternal eating habits and children's eating habits**

Most of the participants including both mothers and children agreed that the eating habits of the mothers affect her child's eating habits.

To assess the possible roles of parenting practices of mothers in explaining differences in eating behaviours of adolescents, in a more precise manner, the scoring patterns were developed. Each adolescent's responses were evaluated for twenty-six questions asked to know their eating habits. Similarly, each mother's responses were evaluated for twenty-five questions about their eating habits and feeding practices.

Questions related to the consumption pattern as per the frequency and ideal practices were scored, the highest score is given to the ideal consumption as per the frequency and correct practice and vice-versa. Table 2(a) illustrates the total and mean scores of the subjects for eating behaviour and feeding practices followed by adolescents and mothers respectively. In a similar manner, a scoring pattern was also developed for mothers' responses. There were twenty-five questions for which scoring was done according to the statements provided to them. The score is tabulated in Table 2(b).

To assess if there is any correlation between the perception of mothers and their children (adolescents) with respect to the former's impact on the eating behaviour of their child, Pearson's correlation was calculated which came out to be  $r$  equals to 0.57 depicting a weak though positive and statistically significant correlation ( $p < 0.005$ ) thus, highlighting that mothers have an impact on the eating habits of their children.

### **Conclusion**

Ultra-processed foods and soft drinks are consumed by 80-90% of adolescents, as well as adolescents like foods high in fat and salt, however, less number of adolescent prefers sweet foods. The eating habits of the mothers were way different in contrast to adolescents. Overall, mothers were found setting up a good example for their children. This study connoted that parenting practices of mothers influence the eating behaviour of the adolescents to some extent. The correlation between adolescent's and mother's perception of maternal influence on eating habits of child is positive.

### **Limitation**

Since the study was conducted during the COVID-19 pandemic, online survey was used to collect data since it was not possible to collect same in person, also the sample size that could be gathered was not large.



Table 2(a): Total and Mean scores of the subjects for eating behaviour and feeding practices followed by adolescents

Parameters		Range Total score (Mean score)	Obtained score (Mean±SD)
Skipping meal		0-108	57 (1.58 ±1.13)
Frequency of eating outside		0-108	55 (1.52±1.11)
Types of food prefer eating outside		0-108	52 (1.44±1.42)
When the adolescent's mother is not at home	Eat snacks if feel hungry	0-108	59 (1.63±0.72)
	Buy food from outside	0-108	69 (1.91±0.69)
	Do not eat anything	0-108	88 (2.44±0.61)
	Cook for the themselves	0-108	38 (1.06±0.95)
When adolescent's mother is at home but busy with some work	They cook	0-108	38 (1.06±0.82)
	They eat fruits	0-108	57 (1.59±0.77)

	Ask their mother to make a meal for them	0-108	56 (1.56±0.99)
	Their mothers ask them to eat packaged snacks	0-108	90 (2.5±0.56)
	Their mothers allow them to buy food from outside	0-108	76 (2.11±0.57)
Consumption of fruits		0-36	33 (0.91±0.28)
Preference to take lunchbox with them at their school/college		0-72	59 (1.63±0.68)
Get pocket money or an allowance		0-72	52 (1.44±0.69)
Eat food only when someone serves for them		0-36	25 (0.69±0.46)
Use pocket money to eat outside		0-36	9 (0.25±0.43)
Consumption of sweet foods		36-72	52 (1.44±0.50)
Way of consumption of sweet foods		0-36	17 (0.47±0.51)
Consumption of fried foods		36-72	40

		(1.11±0.31)
Way of consumption of fried foods	0-36	20 (0.56±0.50)
Consumption of soft drinks	36-72	43 (1.19±0.40)
Way of consumption of soft drinks	0-36	25 (0.69±0.46)
Consumption of ultra-processed foods	36-72	42 (1.16±0.37)
Way of consumption of ultra-processed foods	0-36	21 (0.58±0.5)
Perception of adolescents on the influence of the mother on child's eating habits	36-180	129 (3.58±0.96)

**Table 2(b): Total and Mean scores of the subjects for eating behaviour and feeding practices followed by mothers**

Parameters		Range Total score	Obtained score (Mean±SD)
Frequency of having a conversation with a child related to his/her habits		0-144	88 (2.44±1.16)
Asks the preference of children what he or she wants to eat in day's meals		0-72	31 (0.86±0.35)
Cook his/her favourite dishes		0-72	30 (0.83±0.38)
Frequency of taking dinner with a child		36-180	120 (3.34±1.77)
Frequency of their child eating with family		0-144	113 (3.13±1.36)
"Do you permit your child on the following points:"	If your child asks to eat outside foods, you allow him/her	0-108	56 (1.56±0.91)
	If your child asks to buy ultra-processed foods, you let him/her buy	0-108	66 (1.83±0.81)
	Is your child allowed to take soft drinks whenever he/she wants	0-108	62 (1.72±0.91)
	Is your child allowed to eat outside food, whenever he/she wants	0-108	50 (1.39±0.99)

Building pressure on children to eat healthy food options	0-36	28 (0.78±0.42)
Use rewards to encourage healthy eating	0-36	20 (0.56±0.50)
Praising the child for eating healthy foods	0-36	31 (0.86±0.35)
Encouragement through negotiations	0-36	28 (0.78±0.42)
Encourage their child to eat fruits and vegetables	0-36	34 (0.94±0.23)
Discourage their child to eat sweets	0-36	15 (0.41±0.5)
Response to statements used to encourage the child through coercing	0-108	16 (0.44±0.80)
Response to statements used to encourage coaching	0-108	26 (0.72±0.88)
Response to cater their children's demand	0-108	17 (0.42±0.65)
Consumption of sweet foods	36-72	47 (1.30±0.46)
Way of consumption of sweet foods	0-36	21 (0.58±0.5)

Consumption of soft drinks	36-72	51 (1.41±0.5)
Way of consumption of soft drinks	0-36	16 (0.44±0.50)
Consumption of ultra-processed foods	36-72	58 (1.61±0.49)
Way of consumption of ultra-processed foods	0-36	6 (0.16±0.37)
Perception of mothers on the influence of the mother on child's eating habits	36-180	143 (3.97±1.03)

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