

Research Article

# Dietary Behaviours among Adolescent Girls in Pathanamthitta District, Kerala

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## I N F O

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## A B S T R A C T

**Background:** Adolescence is a time of rapid transition and complex experiences with society, defining the capacity of a person to reach adult life. Diet plays a crucial role in overall development of the child precisely female child as they will become the future mothers. The study objective is to assess the dietary pattern of the school adolescents in various region of the district.

**Methods:** 869 school going adolescents 10-18 years from 20 schools in Pathanamthitta District, Kerala participated in this study and was distributed a questionnaire exploring the dietary habits using food frequency questionnaire along with socio demographic details.

**Result:** Altogether, penurious diet patterns were observed, 64.6% were habituated to skip one meal in a day, 86.7% consumed junk food, 35.5% adolescents skipping breakfast, consumption of Green leafy vegetables was diminished, nearly two third of adolescents did not consumed any fruit once in a day. Most of the respondents depended on rice with one or two vegetables.

**Conclusion:** Lack of variety food intake in adolescents may vary due to numerous factors like availability, socio-economic status, parent education, accessibility. Dietary diversity score and dietary assessment needs to be calculated and there is a need of in depth study of nutrient consumption.

**Keywords:** Adolescent, Dietary Behaviours, Agricultural Pattern in Kerala

## Introduction

Unhealthy food choices in adolescents are increasing, which gradually can lead to Non-Communicable Diseases (NCDs) in long term.<sup>1</sup> From the last two decades, obesity among adolescents has accelerated which is raising concern about food consumption patterns.<sup>2</sup> Worldwide similar dietary behaviours such as skipping breakfast, snacking between

meals and starving oneself to appear physically slim have become the top reasons for overweight or underweight among adolescents.<sup>3</sup> In developing countries like India, other major concerns regarding eating habits in adolescents can be due to less availability of diverse crops at all places and at all times, as the distribution of staples or locally grown food is not even throughout the country. Several states such as Kerala, which is majorly into cash crop production,

struggle for variety in food plate. Food insecurity is always associated with low socio-economic status at household level, unable to consume appropriate diet, uncertainty for food supply, anxiety, not having enough money to buy food, encountering hunger, purchasing cheap food due to monetary limitations which results in lack of nutrients in their food which affects cognitive development, infirmity and intellectual problems in children.<sup>5</sup> Evidence clearly found that skipping dinner was found to be common among girls and they believe skipping dinner will help them retain body weight.<sup>6</sup> Modern consumption pattern and reduction in physical activities are the reasons behind these problems in Kerala where Lifestyle diseases have increased both in urban and rural areas.<sup>7</sup> There are many other factors that also influence the development of adolescents eating patterns. These include nutrition knowledge of the family members especially mothers, their individual taste, peer influence, family atmosphere, school atmosphere, teachers, friends.<sup>8</sup>

Adolescence is considered as the most crucial state in human life wherein their eating habits can be affected by minor changes in the surroundings; it is noted that to incorporate healthy food habits in children the ambience plays an important role. Looking in to various aspects of food-related parenting practices, provision of food in the surrounding regions, eating meals with family members are also powerful indicators of food consumption among adolescents.<sup>9</sup> Therefore, this study would be highlighting the assessment of simple dietary pattern by the assessment of food frequency questionnaire.

## Materials and Method

A cross-sectional study was conducted in rural, semi-urban and urban locals at Pathanamthitta District, Central Kerala; 20 different schools including 11 governments- aided schools and 9 government schools were selected through random sampling. For the purpose of data collection of the adolescent age group 10 to 18 years were included in this study. Detailed survey methods were explained to the school authority and respondents. Food-Frequency Questionnaires (FFQ) are designed to assess dietary patterns by collecting information regarding the frequency with which specific food items are consumed over last period of one year. Food Frequency Questionnaires (FFQs) are the most common dietary assessment tools used in epidemiological studies across the world to evaluate the long-term customary food intake in a population because they are relatively simple to construct and easy to administer.<sup>10</sup> The current study focused on 48 foods which, in the FFQ. The frequencies of food items consumption were reported over the last year on a daily, daily two times, weekly two or three times, weekly four times, monthly, monthly two or three times, yearly and never. Self-administrated questionnaire was given and translated in to local language.

Study population (n): 869 adolescent girls between age group of 10 to 18 years.

## Inclusion Criteria

Adolescent girls from the selected schools, between the specified age group.

## Exclusion Criteria

Students who were not present in school premises or who were unwilling to participate.

Ethical approval was obtained from Pushpagiri Medical College.

## Study Variables

- Socio-demographic variables: Age, region, religion, father's education, father's occupation, mother's education, mother's occupation, type of family.
- Diet history: Type of diet, habit of skipping meals and consumption of junk food.
- Eating habits through Food Frequency Questionnaire: Food Frequency Questionnaire (FFQ) consisted of a finite list of foods and beverages with response categories to indicate usual frequency of consumption over the time period.

## Data Collection Procedure

A consent form for data collection was sent to the school authorities prior to conducting study; also, a consent form was sent to the parents. A pre-tested food frequency questionnaire was distributed among the students with the help of class teachers. Questionnaire was divided into three parts:

- Demographic profile
- Diet history
- Food frequency questionnaire

The questionnaire was validated one and was developed with the consent of experts in health and community level. Study was described to the students in their local language. After receiving consent from the parents, students were asked to fill the questionnaire.

## Data Management

After filling up of questionnaire, data was collected and coded properly and entered in Excel sheet (Microsoft Excel 2007) and relevant data checking measures were used to make certain the quality of data collected, afterwards data was analysed with the use of SPSS software version 16.0. Frequency and percentage were used to analyse demographic and consumption pattern whereas Chi-Square test was use to find the association between rural, semi-urban and urban locals with food that are consumed frequently and infrequently.

**Result****Table 1. Socio-demographic characteristics of the adolescents**

Description		N (%)
Age	Early adolescent (10-12)	164 (18.9)
	Middle adolescent (13-15)	421 (48.4)
	Late adolescents (16-18)	284 (32.7)
Region	Rural	452 (52.0)
	Urban	284 (32.7)
	Semi urban	133 (15.3)
Religion	Hindu	496 (57.1)
	Christian	324 (37.3)
	Muslim	49 (5.6)
Father education	Middle	90 (10.4)
	High school	703 (80.9)
	Graduate & above	34 (3.9)
	Not known	42 (4.8)
Father occupation	Skilled & others	685 (78.8)
	Clerical & shopowners	120 (13.8)
	semi profession	22 (2.5)
	Not known	42 (4.5)
Mother education	Middle	43 (4.9)
	High school	726 (83.5)
	Graduate & above	82 (9.4)
	Not known	18 (2.1)
Mother occupation	Housewife	594 (68.4)
	Skilled & others	158 (11.3)
	Clerical & semiprofession	98 (11.3)
	Not known	19 (2.2)
Type of family	Extended nuclear	225 (25.9)
	Nuclear	644 (74.1)

**Table 2. Dietary habits of the adolescents**

Description	N (%)	Total (%)
Type of diet Vegetarian	35 (4.0)	869 (100)
Non vegetarian	752 (86.6)	
Ovo-lactarian	82 (9.4)	
Skipping meals Yes	561 (64.6)	869 (100)
No	308 (35.4)	
Time of skipping meals Breakfast	306 (35.2)	869 (100)
Lunch	22 (2.5)	
Dinner	232 (26.7)	
Not written	305 (35.6)	

Junk food Yes	753 (86.7)	869 (100)
No	116 (13.3)	

**Table 3. Depiction of food groups consuming by frequently and infrequently of adolescent**

Descriptive items	Frequently	Infrequently
Rice	865 (99.5)	4 (.5)
Wheat	727 (83.7)	142 (16.3)
Oats	70 (8.1)	799 (91.9)
Raggi	73 (8.4)	796 (91.6)
Green gram	555 (63.9)	314 (36.1)
Cowpea	492 (56.6)	377 (43.4)
yellow dhal	477 (54.9)	392 (45.1)
soya bean	143 (16.5)	726 (83.5)
GLV Red	248 (28.5)	621 (71.5)
GLV Green	247 (28.4)	622 (71.6)
Drumstick leaves	221 (25.4)	648 (74.6)
Potato	652 (75.0)	217 (25.0)
Yam	290 (33.4)	579 (66.6)
Elephant yam	225 (25.9)	644 (74.1)
Colacassia	234 (26.9)	635 (73.1)
Pumpkin	356 (41.0)	513 (59.0)
Bittergurd	337 (38.8)	532 (61.2)
Snakegurd	349 (40.2)	520 (59.8)
Payar	597 (68.7)	272 (31.3)
Beans	529 (60.91)	340 (39.1)
Carrot	507 (58.3)	362 (41.7)
Egg plant	386 (44.4)	483 (55.6)
Cabbage	401 (46.1)	468 (53.9)
Beetroot	399 (45.9)	470 (54.1)
Gooseberry	266 (30.6)	603 (69.4)
Guava	244 (28.1)	625 (71.9)
Plantain (small)	367 (42.2)	502 (57.8)
Banana (kerala nethrakaya)	334 (38.4)	535 (61.6)
Apple	141 (16.2)	728 (83.8)
Pomegranate	155 (17.8)	714 (82.2)
Watermelon	119 (13.7)	750 (86.3)
Pineapple	108 (12.4)	761 (87.6)
Peanut	368 (42.3)	501 (57.7)
Cashewnut	148 (17.0)	721 (83.0)
Badam	119 (13.7)	750 (86.3)
Milk	719 (82.7)	150 (17.3)
Curd	648 (74.8)	221 (25.4)

Buttermilk	578 (6.5)	291 (33.5)
Beef	128 (14.7)	741 (85.3)
Mutton	59 (6.8)	810 (93.2)
Pork	97 (11.2)	772 (88.8)
Fish	512 (58.9)	357 (41.4)
Egg	558 (64.2)	311 (35.8)
Coconut oil	690 (79.4)	179 (20.6)
Sunfloweroil	374 (43.0)	495 (57.0)
Palmoil	326 (37.5)	543 (62.5)
Butter	125 (14.4)	744 (85.6)
Ghee	147 (16.9)	722 (83.1)

Table 1, shows the 869 school-going adolescent girls of the age group between 10 to 18 years from rural, semi-urban and urban schools took part in the study after getting informed consent and questionnaire about food habits.

Table 2, shows the majority of the adolescent girls were following a non-vegetarian diet. Majority skipped their breakfast and most were habituated eating outside at least once a week.

Table 3, depicts the diet history of the participants who took part in the survey. Food grains were the main components of their diet although some variation in diet. Rice is the principal choice of food grain and was the staple food followed by wheat, whereas oats and ragi were included in their diet in very less amount.

**Table 4. Association between food consumption by food frequency in rural, urban and semi-urban**

Description food items		Rural	Urban	Semi-urban	Chi-square p-value
Wheat	FR	395 (87.4)	213 (75.0)	119 (89.5)	23.467 0.001
	INF	57 (12.6)	71 (25.0)	14 (10.5)	
GLV Green	FR	142 (31.4)	60 (21.1)	45 (33.8)	11.33 0.003
	INF	310 (68.6)	224 (78.9)	88 (66.2)	
Drumstick leaves	FR	107 (23.7)	64 (22.5)	50 (37.6)	12.68 0.002
	INF	345 (76.3)	220 (77.5)	83 (62.4)	
Potato	FR	335 (74.1)	225 (79.2)	92 (69.2)	5.30 0.070
	INF	117 (25.9)	59 (20.8)	41 (30.8)	
Yam	FR	131 (29.0)	127 (44.7)	32 (24.1)	25.54 0.001
	INF	321 (71.0)	157 (55.3)	101 (75.9)	
Elephant yam	FR	119 (26.3)	83 (29.2)	23 (17.3)	6.81 0.033
	INF	333 (73.7)	201(70.8)	110 (82.7)	
Colacassia	FR	123 (27.2)	89 (31.3)	22 (16.5)	10.11 0.006
	INF	329 (72.8)	195 (68.5)	111 (83.5)	
Pumkin	FR	181 (40.0)	131 (46.1)	44 (33.1)	6.70 0.035
	INF	271 (60.0)	153 (53.9)	89 (66.9)	
Cabbage	FR	198 (43.8)	155 (54.6)	48 (36.1)	14.53 0.001
	INF	254 (56.2)	129 (45.4)	85 (63.9)	
Guava	FR	140 (31.0)	81 (28.5)	23 (17.3)	9.56 0.008
	INF	312 (69.0)	203 (71.5)	110 (82.7)	
Pomegranate	FR	92 (20.4)	53 (18.7)	10 (7.5)	11.74 0.003
	INF	360 (79.6)	231 (81.3)	123 (92.5)	
Watermelon	FR	71 (15.7)	44 (15.5)	4 (3.0)	15.18 0.001
	INF	381 (84.3)	240 (84.5)	129 (97.0)	
Pineapple	FR	61 (13.5)	38 (13.4)	9 (6.8)	4.62 0.099
	INF	391 (86.5)	246 (86.6)	124 (93.2)	
Peanut	FR	184 (40.7)	138 (48.6)	46 (34.6)	8.31 0.016
	INF	268 (59.3)	146 (51.4)	87 (65.4)	

Cashew nut	FR	68 (15.0)	62 (21.8)	18 (13.5)	7.04
	INF	384 (85.0)	222 (78.2)	115 (86.5)	0.030
Milk	FR	374 (82.7)	246 (86.6)	99 (74.4)	9.41
	INF	78 (17.3)	38 (13.4)	34 (325.4)	0.009
Beef	FR	49 (10.8)	44 (15.5)	35 (26.3)	19.78
	INF	203 (89.2)	240 (84.5)	98 (73.7)	0.001
Fish	FR	236 (52.2)	204 (71.8)	72 (54.1)	29.21
	INF	216 (47.8)	80 (28.1)	61 (45.9)	0.001
Pork	FR	40 (8.8)	35 (12.3)	2 (16.5)	6.70
	INF	412 (91.2)	249 (87.7)	111 (83.5)	0.035
Mutton	FR	22 (4.9)	19 (6.7)	18 (13.5)	12.20
	INF	430 (95.1)	265 (93.3)	115 (86.5)	0.002
Egg	FR	287 (63.5)	196 (69.0)	75 (56.4)	6.49
	INF	165 (36.5)	88 (31.0)	58 (43.6)	0.039
Coconut oil	FR	372 (82.3)	226 (79.6)	92 (69.2)	10.83
	INF	80 (17.7)	58 (20.4)	41 (30.8)	0.004
Sunflower	FR	188 (41.6)	136 (47.9)	50 (37.6)	4.71
	INF	264 (58.4)	148 (52.1)	83 (62.4)	0.095
Palm oil	FR	184 (40.7)	106 (37.3)	36 (27.6)	8.16
	INF	268 (59.3)	178 (62.7)	97 (72.9)	0.017
Butter	FR	59 (13.1)	32 (11.3)	34 (26.6)	16.38
	INF	393 (86.9)	252 (88.7)	99 (74.4)	0.001

Further analysis of the cross tabulation indicated the food frequency consumption of the adolescents in various regions. Out of 48 items from the frequency list 24 items from each food groups were significantly associated with regions. The results depict highly significant  $p < 0.005$ . The comparison between the frequent consumption of food group items in rural and urban areas is significantly different. Percentage of consumption of a few items of food in comparison with urban area was more than rural area. Present study shows urban consumption is more than rural.

## Discussion

The present study explores the food habits and diet patterns of the adolescents in the three regions of Pathanamthitta district in Kerala. The food consumption pattern, socio demographic details and dietary behaviours were assessed. Statistically highly significant association between rural, semi-urban and urban localities and consumption of food item frequency was found. The consumption of wheat, GLV drumstick leaves and fruit items such as guava, pomegranate and pineapple was less in urban respondents' consumption in comparison to rural region. Data showed statistically significant association between region and these food items.

There was closely linked with agricultural production, food system and health, also environment changes, opening food malls and easy availability of packed food made certain changes in past few years in urban area.<sup>11</sup>

The consumption of wheat was highest in rural location with 87.4% locals consuming the wheat as staple food after rice and with a P-value of  $.001 < 0.05$  these figures were found to be highly significant. The consumption of green leafy vegetables in infrequent consumption was highest in urban location 78.9% with a P-value of  $0.003 < 0.05$ ; this data was statistically significant. Drumstick leaves' infrequent consumption was highest in urban area 77.5% with a P-value of  $0.002 < 0.05$  which makes it statistically significant. Utilization of potato was highest in urban region with 79.2% respondents consuming it frequently with a P-value of  $0.07 > 0.05$  make this not significant. Usage of Yam was highest in urban settings with 44.7% residents having it frequently and with a P-value of  $0.001 < 0.05$  this data was found to be highly significant. Though food is a basic requirement for all, disparity in the expenditure on food, quantity consumed, calorie and nutrient intake do exist among various income strata.<sup>12</sup> Meat and milk and milk product consumption was quiet different in

the present study. Fish is one of the unavoidable diets in every household in Kerala. The present study shows meat consumption was very poor in urban and rural areas where as fish and eggs were almost similar. The fact that a considerable proportion of Indians are vegetarian and animal foods are usually eaten less often is indicated by a recent literary review describing trends in diets and intake patterns in various states of India.<sup>13</sup> Besides the availability of home-food, the family food rules can also play a vital role in defining the habits of young people in food.<sup>14</sup>

Children are easily influenced by advertising/TV/Media and make an effort to adopt the eating habits which can be harmful in the long term. Adolescent girls are seen to be cautious of their body image and hence, in current study, we found that majority of students skip breakfast which is considered as the most important meal of the day, this can be due to maintaining the slim physical appearance, peer pressure or financial constraint, thus, nutritional education for the parents should be given priority.<sup>15</sup> Educated parents can play a crucial role in incorporating healthy eating habits in children as seen in western countries.<sup>16,17</sup> Another factor which can influence the dietary practices can be associated with the religion or customs one follows.<sup>2</sup> India is a land of religions, beliefs and traditions and each religion has certain cultural restrictions in food due to which majority of the people do not consume the specific food due to their beliefs.

Since we depend on the supply of a major part of our food from outside the state allowing fruit farming in under-utilised plantations could mark a beginning. But the state government needs to look at total horticulture solutions, vegetables and fruits completing the basket of products. In the days to come, Kerala can truly re-engineer its footprint as a modern farm-based economy with the plantation sector being brought under the industries sector even in the state as it already is at the Centre.

## Conclusion

The present study described the dietary pattern and dietary behaviours of the school going adolescent girls and many of the other factors that influence food intake in adolescents like availability, socio-economic status, parent education, accessibility, cultural restrictions, peer pressure, hormonal changes, lack of awareness etc. and this can be improved with multi-sector approach by the government and by schools. Dietary diversity score and dietary assessment needs to be calculated and there is a need of in depth study of nutrient consumption so that we can measure whether it is able to meet Recommended Dietary Allowance (RDA) for Indian diet.

**Conflicts of Interest:** None

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