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ORIGINAL ARTICLE

# Gaps in nutrition knowledge and barriers to eating healthy among low-income, school-going adolescent girls in Delhi

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## Abstract

**Aim** This study assessed the nutrition awareness, attitude and practices of adolescent girls in Delhi and focussed on identifying gaps in knowledge and barriers to healthy eating.

**Subject and method** A total of 250 adolescent girls (13–15 years old) belonging to low-income families were selected from four government-run schools in four districts of Delhi in 2016–2017. The cross-sectional study involved assessing the girl's nutrition knowledge, attitude and practices and frequency of food consumption using a pretested questionnaire. Focus group discussions held with teachers, parents and the girls themselves helped to shed light on reasons for not adopting healthy food choices.

**Results** Nearly three quarters (72%) of girls skipped one or more meals every day. About 34% of girls stated it was not necessary to consume fruit and vegetables on a daily basis. Around 51% of girls had not consumed green leafy vegetables in the past week. Only 40% ate fruit daily and 58% substituted meals with snacks on a regular basis. 'Not feeling hungry' and 'disliking the taste of healthy foods' were identified as major barriers to eating a healthy diet. Only 18% of girls knew that a lack of iron in the diet could cause anaemia. A significant but weak correlation between nutrition knowledge and attitude was observed ($r = 0.258$; $p < 0.05$). There was no significant relationship between nutrition knowledge and practices ($p > 0.05$). Teachers were of the opinion that the school curriculum provided enough background about health and nutrition. However, the low scores of the girls ($6.892 \pm 3.24$) did not reflect this. Parents believed their children did not have healthy eating habits and expected schools to provide the necessary information.

**Conclusion** Innovative behaviour change strategies are needed to inculcate healthy eating habits with the engagement of parents and teachers. School curriculums need to be modified to impart not only appropriate nutrition knowledge but also motivation for behaviour change.

**Keywords** Food habits · Meal skipping · Snacking · Adolescent girls · Nutrition

## Introduction

Over the past decade, rapid urbanisation and economic development have led to drastic changes in the lifestyle and health behaviour of people living in developing countries. This has resulted in a significant impact on their health and nutritional status. Development of chronic diseases during adulthood may be a result of unhealthy dietary behaviours practised during childhood. Studies from the literature indicate that even young children from developing countries are increasingly making unwise food choices, which can be attributed to a lack of knowledge and wrong perception towards healthy foods (Mirmiran et al. 2007; Zaborskis et al. 2012). This is mainly due to increased independence, easy access to food outlets and the growing influence of media. Lack of knowledge about what to eat, attitudes towards healthy eating and social, economic, cultural and psychological factors all influence the process of food selection. This study assessed the nutrition

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knowledge, attitudes and practices of school-going adolescent girls and tried to identify barriers to healthy eating.

## Methods

This study was cross–sectional in design. Four government-run schools were purposively selected as most students attending these schools were of low socio-economic status. The schools were situated in north, east, west and south Delhi in order to get a more representative sample. In all the schools, one section each from classes VIII and IX was randomly selected. Each section comprised 30–35 students and all students were enrolled for the study, resulting in a total of 250 adolescent girls in the age range of 13–15 years.

A pretested interview schedule was used to elicit general and dietary information from the respondents. The content validity of the tool was checked by subject experts. It contained questions about dietary pattern and food habits and knowledge, attitude and practices of the adolescents. It also investigated their likes and dislikes, frequency of eating different foods, consumption of breakfast and meal skipping. Focus group discussions (FGDs) were also conducted to gain a better understanding of food behaviour, factors influencing food choices, and barriers to and facilitators of healthy eating among young girls. In each school, two FGDs with girls, one with mothers and one with school staff were conducted. Hence, a total of eight FGDs with adolescent girls, four with mothers of girls and four with teachers of schools were conducted. The FGD sessions were conducted with 10–12 participants in each group and lasted about 40–60 min.

The level of nutrition knowledge was determined using multiple choice questions concerning food sources of nutrients, healthy eating and anaemia. For each question, a correct response was coded as 1 and an incorrect response as 0. The total score for every girl was then calculated by adding up the scores of correct responses. Those who scored ≤ 40% were categorised as having 'low' knowledge scores, 41–70% as 'moderate' and > 70% as 'high' nutrition knowledge scores. To assess their attitude towards dietary behaviour and healthy eating, the girls were asked ten multiple choice questions with four options: "totally agree", "partially agree/disagree", "totally disagree" and "do not know". For every question, a right attitude and the respondent being firm about it (i.e. totally agree/disagree) was coded as 2, a right attitude but the respondent not being very firm about it (i.e. partially agree/disagree)" as 1 and a wrong attitude (i.e. totally agree/disagree) or "do not know" as 0. Scores for food practices were also determined by asking ten questions relating to dietary habits, for which every correct practice was scored as 1 and every incorrect practice as 0. Totals were then obtained by adding up the score of each question.

Data were expressed as numbers and percentages and analysed using software R version 3.3.2. Descriptive statistics such as mean and standard deviation were calculated. The Pearson product-moment correlation and chi-square test were used to establish associations among nutrition practice, knowledge and attitude and between knowledge and frequency of food consumption. Results were considered significant at $p < 0.05$.

## Results

### Nutrition knowledge

This study assessed the proportion of girls who responded correctly to basic questions testing their knowledge about nutrients and food sources and how they affected health. The majority of respondents (87%) had low nutrition-related knowledge, about 12.8% had moderate and none had high scores. The mean knowledge rating was 6.892 ± 3.24, with a minimum score of 0 and maximum of 17, out of a total score of 26 (Table 4). Most girls (96%) were not aware that overconsumption of sugary foods can result in obesity, and just 22.4% of them were able to link hypertension with high intake of salty foods. Only 21.2% of adolescents knew that eating iron-rich foods could help prevent anaemia, indicating that most did not understand the link between iron deficiency and anaemia (Table 1).

### Attitude towards healthy eating

The majority of the girls (93.20%) agreed that the food they eat determines their health status. Further, 82.4% of girls realised that adolescents needed extra energy and protein in their diet because of rapid growth and bodily changes. Around 98% were of the opinion that it was essential to eat breakfast before going to school. A small proportion (11.2%) thought that milk was important only for small children and not for adolescents. Almost one-third (34%) of the respondents thought that it was not necessary to consume fruit and vegetables every day. More than half of the girls (59.2%) believed that eating healthy food was more expensive. However, few (15%) understood that eating a balanced diet promoted healthy growth, and 34% were convinced that eating oily foods (ghee) helped them to build strong muscles. Table 2.

### Dietary patterns

About 19.2% of the adolescent girls were vegetarian, 11.6% were ovo-vegetarian (eating eggs but not flesh foods) and 69.2% were non-vegetarian (eating eggs and flesh foods). The majority of subjects (81.2%) consumed more than three meals per day.

**Table 1** Proportions of respondents with correct answers about various aspects of nutrition ($n = 250$)

| Nutrition aspect | Number (%) |
|---|---|
| Concept of a balanced diet | 116 (46.4%) |
| Importance of good food habits | 161 (64.4%) |
| Healthy levels of fat in the food | 85 (34%) |
| Importance of variety in meals | 210 (84%) |
| Importance of fruit and vegetables | 112 (44.8%) |
| Nutrients in milk and milk products | 77 (30.8%) |
| Adverse effects of high-fat diet | 117 (46.8%) |
| Adverse effects of too many sugary foods | 112 (44.8%) |
| Adverse effects of highly salted foods | 56 (22.4%) |
| Lack of iron as a cause of anaemia | 47 (18.8%) |
| Heavy menstruation as a cause of anaemia | 39 (15.6%) |
| Prevention of anaemia | 53 (21.2%) |

## Frequency of consumption of various foods

About 62% of the adolescents liked eating vegetables and 40.8% enjoyed green leafy vegetables. However, only 47.6% reported that they had consumed green leafy vegetables once in the past week, 1.6% had eaten them 2–3 times in the past week while 50.8% of girls said they had not eaten them at all in the past week. Of the girls who reported no consumption, the main reason cited was a distaste (74.4%) for vegetables while a few reported high cost (7.2%). Other reasons cited were that vegetables were not prepared in the home and a preference for eating non-vegetarian food. Regarding consumption of fruit, only 40.4% of the girls ate fruit on a daily basis while approximately 10% consumed fruit 3–4 times a week and 30% only ate them once or twice a week. Follow-up questions revealed that the reasons for not eating fruit regularly were dislike (55.2%), high cost (27.6%) and non- availability at home (17.2%).

Consumption of other foods like milk was also assessed. About 16.8% of girls drank less than one cup of milk (approximately 200 ml) per day, 43.6% drank 1–2 cups and only 1.2% drank about 3–4 cups. Milk was not consumed at all by 7.6% of girls, whereas 30.8% of girls consumed it only in other forms, e.g. in tea or coffee (Fig. 1).

## Snacking habits

To assess their snacking behaviour, the girls were asked what they usually ate as snacks. The findings are presented in Table 3. The most frequently consumed snacks included salty foods such as *namkeen* (fried savouries) and potato chips and baked foods such as *fan* (baked savory food item), biscuits/crackers, bread, etc. Other commonly consumed snacks included sweet foods such as chocolates/toffees and fried foods including *bhatura* (fried thick leavened bread), *samosa/kachori* (fried snack with savory filling) and noodles or pasta. This pattern was also corroborated in the FGDs where the common sentiment that emerged was that the girls liked eating food outside the home that was spicy and tasty.

## Meal skipping

There was a trend towards skipping meals as 72% of girls skipped at least one meal every day. Of these, 85% skipped one meal per day and 15% skipped two meals per day.

**Table 2** Responses to statements about food and health

| Statements | Number of girls (%) and responses | | | |
|---|---|---|---|---|
| | Totally agree | Totally disagree | Partially agree/disagree | Do not know |
| The food you eat determines your health status | 233 (93.2%) | 4 (1.6%) | 1 (0.4%) | 12 (4.8%) |
| Adolescents need extra energy and protein because of rapid growth and bodily changes | 198 (79.2%) | 10 (4%) | 8 (3.2%) | 34 (13.6%) |
| It is essential to eat breakfast before going to school | 246 (98.4%) | 3 (1.2%) | 0 (0%) | 1 (0.4%) |
| Eating foods from street vendors is a healthy practice | 23 (9.2%) | 209 (83.6%) | 10 (4%) | 8 (3.2%) |
| Milk is important only for small children and not for adolescents | 28 (11.2%) | 214 (85.6%) | 0 (0%) | 8 (3.2%) |
| It is not necessary to eat fruit and vegetables every day | 74 (29.6%) | 138 (55.2%) | 11 (4.4%) | 27 (10.8%) |
| A balanced diet helps us to grow and be healthy | 171 (68.4%) | 38 (15.2%) | 4 (1.6%) | 37 (14.8%) |
| Eating healthy food always costs more | 148 (59.2%) | 70 (28%) | 12 (4.8%) | 20 (8%) |
| Eating ghee and oily foods helps build strong muscles | 85 (34%) | 127 (50.8%) | 4 (1.6%) | 34 (13.6%) |

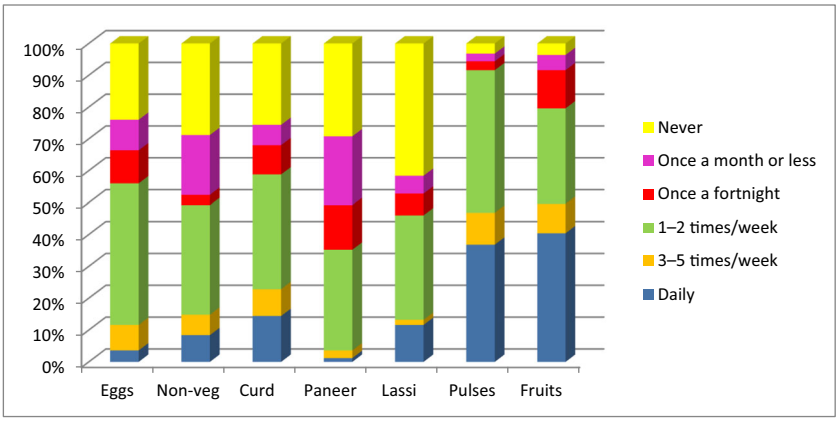


**Fig. 1** Frequency of consumption of various foodstuffs ($n = 250$). **Paneer*, cottage cheese; *Lassi*, curd based sweet or salty beverage

Breakfast was reported as the meal most often omitted followed by lunch and dinner (Fig. 2). The reasons for this varied. About 24% of girls reported lack of time and another 24% reported not feeling hungry. Others reported being too tired to eat or sleeping early at night or after school, hence missing their dinner or lunch respectively. The results also showed a high frequency of snacking, with 57.6% of girls substituting breakfast, lunch or dinner with snacks on a regular basis.

More than one quarter of respondents (28%) never ate breakfast at all. Of the remaining girls who did have breakfast, 77.2% ate breakfast daily, 15% ate it 4–5 days/week, and 7.8% only ate it two or three times a week. Under an initiative of the Government of India, adolescent children in schools are provided with weekly iron and folic acid tablets in an effort to battle the high prevalence of anaemia in this group. About two-thirds of respondents (68.8%) always took them, around 8.8% sometimes took them, and 22.4% did not take them at all. When asked if they faced any problems after taking the tablets, 12.4% of girls reported adverse symptoms of vomiting, abdominal discomfort, stomach ache, rashes, etc.

**Table 3** Frequency of consumption of snacks

| Food item | Frequent Number (%) | Weekly Number (%) | Sometimes Number (%) |
|---|---|---|---|
| Fried foods | | | |
| Poori/bhatura | 6 (2.4) | 107 (42.8) | 95 (38) |
| Samosa/kachori | 41 (16.4) | 96 (38.4) | 87 (34.8) |
| Pakoras | 22 (8.8) | 84 (33.6) | 105 (42) |
| Chilli potatoes/French fries | 43 (17.2) | 73 (29.2) | 54 (21.6) |
| Salty foods | | | |
| Namkeen | 168 (67.2) | 60 (24) | 10 (4) |
| Potato chips | 161 (64.4) | 60 (24) | 9 (3.6) |
| Baked foods | | | |
| Bread | 118 (47.2) | 91 (36.4) | 12 (4.8) |
| Biscuits/cookies | 150 (60) | 54 (21.6) | 8 (3.2) |
| Rusk/fan | 146 (58.4) | 48 (19.2) | 7 (2.8) |
| Sweet foods/drinks | | | |
| Chocolates/toffee | 106 (42.4) | 92 (36.8) | 20 (8) |
| Mithai | 21 (8.4) | 58 (23.2) | 120 (48) |
| Cakes/pastries | 15 (6) | 55 (22) | 121 (48.4) |
| Soft drinks | 55 (22) | 76 (30.4) | 68 (27.2) |
| Ice cream | 85 (34) | 88 (35.2) | 49 (19.6) |
| Others | | | |
| Pasta/noodles | 66 (26.4) | 87 (34.8) | 52 (20.8) |
| Momos | 65 (26) | 65 (26) | 29 (11.6) |
| Chaat | 31 (12.4) | 87 (34.8) | 62 (24.8) |

*Frequent, more than 3 times/week; Weekly, 1–2 times/week; Sometimes, < once/week. **Poori*, fried bread; *Pakoras*, fried snack (fritter); *Rusk*, dry biscuit or piece of twice-baked bread; *Mithai*, sweets; *Chaat*, a savory snack; *Momos*, steamed dumpling

## Relationship among nutrition knowledge, attitude and practices

Nutrition knowledge was not associated ($p > 0.05$) with dietary practices, but was found to have a weak but significant relationship ($p < 0.05$) with attitude towards food. It was found to have no significant correlation ($p < 0.05$) with frequency of consumption of food such as milk and milk products, fruits and vegetables and fried foods (Tables 4 and 5). This implies that the frequency of consumption of these foods is independent of the nutrition knowledge possessed by the girls. A significant association was observed ($\chi^2 = 6.6499$, $p = 0.03597$) between awareness and consumption of salty foods such as *namkeen* (savouries). Although these girls know about the ill effects of eating excessive salty foods, they were consuming them frequently. Hence just imparting knowledge may not be sufficient to bring about a dietary behaviour change among adolescents.

## Barriers to a healthy diet

Lack of appetite was identified as the major barrier to eating a healthy diet as reported by 62% of girls. Around 58.8% reported the lack of desire to eat anything early in the morning

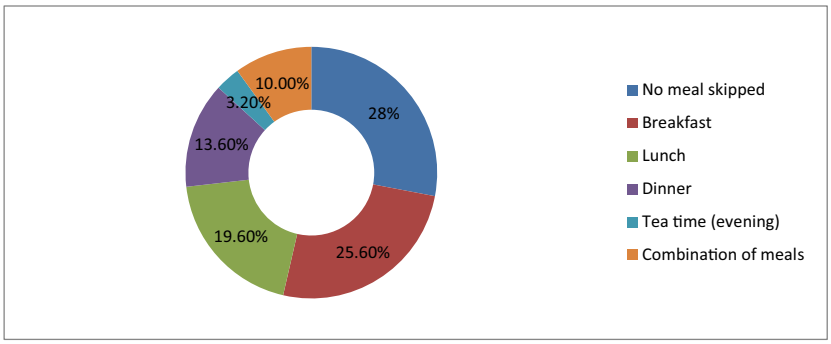


**Fig. 2** Skipped meals ($n = 250$)

before going to school as the reason for skipping breakfast. Further, it was found that 22% of the girls had no time to make breakfast in the morning. Many (33.2%) missed their lunch because of tuition classes that they had to attend after school or in the evening. For 68% of girls, the taste of the food mattered the most; 30.4% of them believed that healthy foods were not appetising and hence they did not eat them. More than half (55.2%) also thought that children should not worry too much about what food they should consume; rather they should eat whatever is cooked or available.

Other reported barriers to healthy eating habits were the high cost of certain foods such as vegetables, fruit, milk and pulses, accessibility to healthier foods and dislike of vegetables. There was limited availability of fresh fruits and vegetables near their homes. Peer influence was also found to be an important factor.

FGDs were conducted with adolescents, mothers and teachers during which the concepts of healthy and unhealthy foods and barriers to and facilitators of healthy eating were discussed.

## Girls

The girls were knowledgeable about which foods were nutritious and good for them and which were unhealthy. They were also aware of the foods that were unhygienic and bad for them, for instance food sold by street vendors. However, they emphasised that their food choices were influenced by a preference for those that were 'tasty'. The majority of girls said that food that tastes good is good food. Their knowledge about diet and health was derived from a variety of sources including school teachers, mothers, doctors and school text books. A major barrier to healthy eating was the taste of food. One 13-year-old girl said that she did not like homemade food, reflecting the general sentiment that 'healthy foods do not taste good'. Although the girls felt that the nutritional value of food was also important, they perceived the cost of healthy foods to be prohibitive hence making them inaccessible to them.

Suggestions put forth by the girls on how these barriers could be overcome to promote healthy eating included cooking food so it is "tasty", "serving food with accompaniments like chutney" and "adding additional flavours to milk to improve the taste". A few girls also mentioned that stricter control over their pocket money should be exercised by parents to prevent them from eating outside food. The girls also thought that nutrition education in the form of lectures would not be taken too seriously and that they would be more receptive to other, more modern forms of communication.

## Mothers

FGDs held with mothers revolved around healthy diets, factors influencing adolescent eating behaviour, trustworthy sources of information for children, challenges faced while feeding their children and suggestions on steps that could be taken to tackle the barriers to healthy eating. The mothers felt that their children mostly consumed fast foods and did not like eating green leafy vegetables, pulses and milk. The mothers were aware of the benefits of good nutrition and its role in growth, development and the prevention of diseases. Most mothers said their girls knew what they should be eating, but only liked food that was tasty. Although both mothers and daughters were aware of the consequences of unhealthy eating, 'taste' emerged as the driving factor in choosing high-fat, high-sugar and high-salt foods. The majority believed that television was a major factor in determining their children's food behaviour. Many also said that their children were

**Table 4** Summary of respondent's nutrition knowledge, attitude and practice ($n = 250$)

| Questionnaire | Total score | Minimum score | Maximum score | Mean (SD) |
|---|---|---|---|---|
| Knowledge | 26 | 0 | 17 | 6.892 (3.24) |
| Attitude | 20 | 6 | 20 | 14.636 (3.03) |
| Practice | 10 | 2 | 10 | 6.672 (2.25) |

**Table 5** Relationship between nutrition knowledge score and frequency of food consumption

| Food products | Chi-square value | *p* value |
|---|---|---|
| Milk | 0.014 | 0.992 |
| Curd | 1.498 | 0.472 |
| Paneer | 2.349 | 0.309 |
| Lassi/buttermilk | 3.637 | 0.162 |
| Fruits | 0.977 | 0.613 |
| Vegetables | 1.26e-29 | 1 |
| Puri/bhatura | 2.272 | 0.321 |
| Samosa/kachori | 1.077 | 0.583 |
| Pakora | 1.203 | 0.547 |
| Namkeen | 6.649 | 0.035 |
| Potato chips | 5.007 | 0.081 |

influenced by their peers since they shared their food together at school and also other places outside the home. The mothers also felt that teachers and the school should motivate the children to eat healthy food and trusted the schools to be the best source of information for their children.

### Teachers

The FGDs with teachers centred around the role of schools in improving nutrition knowledge among children, the influence of different media on teachers and students, and the kind of activities enjoyed by the students. Some teachers felt that some girls looked weak as they were still growing, but it was not related to the amount of food that they ate. All girls were beneficiaries of midday meal programs provided by the government. They also said that the girls ate from outside vendors after school, but in limited quantities. All four schools offered Home Science as a subject, and nutrition and diet planning were part of the course. Although most teachers thought that students would enjoy more activities such as games, stories and role plays, they found it difficult to incorporate them into their curriculum because of lack of time and the heavy workload. Teachers also felt that introducing the children to new recipes or ideas would facilitate healthy eating.

## Discussion

In this study, the percentage of girls with low nutrition knowledge was considerably high (87%). A small number of the other girls (12.8%) possessed moderate knowledge. This finding is in line with other studies that reported low nutritional awareness among school children (Choudhary et al. 2010; Naeeni et al. 2014) despite the fact that all schools included nutrition lessons as a part of the curriculum. The students themselves, however, were of the opinion that they did not need to be concerned about what they ate as they were still young, with the majority of them being unaware that excess consumption of salt, sugar and fat can constitute a risk factor for many diseases. They not only lacked knowledge about healthy eating habits, but also about the adverse effects of an unhealthy diet.

Nutrition knowledge had no significant relationship with dietary practices in the present study. This implies that even though the girls possessed some knowledge about nutrition and health, they could not translate this awareness into their dietary habits and continued to consume unhealthy diets. This finding is similar to other studies that identified a mismatch between the food choices of children and their nutrition knowledge (Choudhary et al. 2010; Kotecha et al. 2013). Similarly, nutrition knowledge was not found to have a significant correlation with the frequency of consumption of food by the girls in our study. This indicates that the frequency of consumption of various food items was independent of the knowledge possessed by the girls and that awareness alone may not be sufficient to bring about a change in their dietary practices and behaviour. Other studies have also confirmed that linking knowledge and practice in nutrition education is a challenge and that a change in attitude and behaviour is also needed (Sherman and Muehlhoff 2007).

Snacking, defined as eating in between the main meals (breakfast, lunch, dinner/supper), is commonly regarded as contributing to excess weight (Berteus Forslund et al. 2005; Piernas and Popkin 2010). We found that the dietary practices of adolescent girls were characterised by unhealthy eating patterns with low consumption of fruit and vegetables and a preference for fast foods high in sugar, salt and fat content. The main reason for eating these foods was that they tasted good and were easily available. Findings from other studies have also reported a high consumption of fast foods among adolescent girls and an increase in snacking on a regular basis (Shrivastav and Thomas 2010; Montazerifar et al. 2012; Omidvar and Begum 2014; Thiruselvakumar et al. 2014). It has been well documented that high intake of fast food is a risk factor for weight gain among adolescents and is negatively associated with the intake of fruit and vegetables (Al-Hazzaa et al. 2011). Similarly consumption of high-fat diets also contribute to a variety of negative health outcomes, including obesity, hypercholesterolaemia and cardiovascular diseases (Kesteloot and Joossens 1992). Our study showed that the availability of fast foods in the environment surrounding homes and schools encouraged the consumption of unhealthy foods by young girls.

Breakfast is often referred to as the most important meal of the day, yet young people are more likely to miss this than any other meal (Pearson et al. 2009). It is a well-established fact that eating breakfast is essential for the health and development of children and adolescents (Shaw 1998), yet studies

have demonstrated that the habit of skipping breakfast is common among the young generation (Kotecha et al. 2013; Ranjana et al. 2013; Omidvar and Begum 2014). Studies have shown skipping of breakfast to be associated with a risk of obesity, which may be associated with cardio-metabolic health during adulthood (Jahns et al. 2001; Zizza et al. 2001; Smith et al. 2010). In the present study, 72% of girls ate breakfast before going to school. This has also been reported by other studies where 64%, 83.1 and 68% of girls respectively were in the habit of eating the first meal of the day on a regular basis (Rao et al. 2007; Kollataj et al. 2011; Adeel et al. 2012). Dinner was missed less compared with other meals. Other studies have also shown the same trend (Adeel et al. 2012; Omidvar and Begum 2014). In contrast to this, a very different finding was observed in a study conducted by Khadri (2010) in the UAE, where 82% of adolescents attending secondary schools were skipping dinner.

The main barriers to healthy eating among the girls were mainly the way food tasted, lack of appetite and the feeling that they did not have to be concerned about what they ate since they were still young. Similar findings were also observed in studies by Adeel et al. (2012) and Kotecha et al. (2013). This study also demonstrated that adolescent's food intake was more an outcome of their own independent dietary habits and less a reflection of their parent's choice and based on their likes and dislikes in eating unhealthy foods outside home or after school. Our findings indicate that an opportunity to make healthier food choices lies in the hands of young adolescents if nutrition knowledge is imparted to them in addition to supporting positive attitudes and behaviour. Parents and teachers need to be informed about their role in encouraging, enabling and empowering adolescents to make good food choices and improve their own health.

## Conclusion

Possessing nutrition knowledge is crucial to achieving healthful dietary behaviours and consequently improvements in health. However, being informed alone is not enough to influence changes in dietary and health behaviours. The findings of this study show that girls' overall knowledge about nutrition and health was poor. A disconnect in dietary awareness, healthy food patterns and the girls' attitude was also observed. Although the school curriculum includes courses dealing with healthy eating, merely imparting information does not appear to be adequate to bring about a positive change in the nutrition-related behaviour of adolescents. Teachers in schools face the challenge of communicating the right information to these children in the most interesting ways to make them adopt healthy eating practices. Therefore, the focus of nutrition interventions has to shift. That is, strategic schemes have to be planned to move the spotlight from the dissemination of theoretical knowledge to actually changing attitudes and dietary practices. To achieve this, the school curriculum needs to be modified to impart not only appropriate nutrition knowledge but also skills. These need to be done in interesting ways for them to be accepted and adopted by the students. Further, encouraging parents to make healthy food choices when purchasing raw food and ingredients, along with enhancing their culinary skills to make healthy food more tasty and appealing to the adolescents at home, would also help to implement healthful eating behaviours in the young generation. The need of the hour is to plan and design strategic interventions involving stakeholders such as family, friends and school staff to translate knowledge into practice and ensure a sustained behaviour change towards positive nutritional habits and good health.

## Ethical consideration

Approval for the study was given by the Directorate of Education, Government of Delhi and principals of respective schools. The study was approved by the Institutional Ethics Committee of Lady Irwin College, New Delhi. The selected students were explained the purpose of the study. Parental consent and child's assent were also taken.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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