

Original Research Article

A study of the dietary habits of school children in Pune city, Maharashtra, India

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ABSTRACT

Background: Diet and nutrition of children influence their current health status and scholastic performance and also have long term consequences reaching well into their adulthood. Further, diet preferences and practices acquired during childhood usually persist for life. Data on nutritional intake of school children is required by public health policy makers to be able to formulate nutritional intervention and also for nutritionists and general practitioners to be able to advise parents and care givers regarding the inadequacies in the diet. This study was carried out in Pune city, to study the dietary patterns and preferences of school children in the age group five to eleven years.

Methods: Qualitative diet survey was carried out by oral questionnaire method. The data collected was on the food habits, frequency of various types of food eaten and the preferences/dislike to various food items. A database was created in MS Excel and Epi Info was used to analyze data. Appropriate inferential and descriptive statistics were calculated.

Results: Around 50% of the children were non-vegetarians and only around 6% were vegetarians. Around 70% of children consumed milk daily though a majority insisted that milk is their least preferred food item. Only 5% children consumed green leafy vegetables daily. A majority of children consumed fruits two to six times. Snacks, fast food and processed food were the most preferred food by the children.

Conclusions: Food habits acquired during childhood persist into adulthood and form the basis of either good health or ill health, as the case may be, in the coming years. Hence there is a need to educate parents, especially in the middle and higher socioeconomic groups regarding correct dietary habits for the children to ensure that they can live healthy and productive lives as adults.

Keywords: Dietary intake, Developing countries, Dietary preferences, School children

INTRODUCTION

School-age children constitute a little less than one quarter of the world's population, and around three quarters of these children live in developing countries.¹ A child's dietary habits acquired early in childhood

continue into adulthood.² The school going ages form the foundation of future life in terms of physical, emotional and mental aspects and strongly influence the child's health in her/his adult life.^{3,4} Adequate and appropriate dietary intake is essential in these ages for inculcating healthy eating habits so as to provide nutrients not just for the immediate growth, development and scholastic

performance but also for long-term health. The health, physical growth, development and educational performance of schoolchildren depend largely on good nutrition. Dietary choices made by the children and their families' influence their health and may contribute towards both malnutrition and 'over nutrition'. The dietary habits of individuals /families /communities vary according to socioeconomic factors, regional customs, traditions, seasonal availability of food items etc. While there are various methods of qualitative and quantitative diet surveys, finding a suitable method of assessing dietary intake for the population under study poses, at times several problems.⁵ Dietary assessment of schoolchildren may be difficult as children due to limited attention span and issues of recall and cognitive abilities for self reporting may not be able to provide accurate responses. Hence researchers usually have to rely on collecting information from the parents or caregivers and while this seems to be a satisfactory alternative when the population of interest is smaller children, however parents may at times be unaware what older children consume when away from home.⁶ Qualitative diet surveys can be used to gain qualitative details of diet and for studying the patterns of food consumption, food likes/dislikes etc at a household level. This method has been used to study meal patterns, dietary habits, preferences and avoidances and weaning and infant feeding practices.⁵ This study was carried out to determine the dietary preferences and patterns of school children in a city of Pune.

METHODS

Place of study

A cross sectional study was carried out in a co-educational school in Pune Cantt, with classes from nursery to class XII with a total strength of around 2100 children. Each class had five sections and children were randomly allocated to different sections irrespective of sex, socioeconomic status or academic performance. The study was carried out on children in the age group of 5 – 11 years in class I to VI from July 2013 to Oct 2013. Admission to the school was only open to children of central government employees.

Sample

This study was part of a larger study wherein the nutritional status of school children was being assessed. Sample size was calculated for determining malnutrition amongst school children and in order to include the largest possible sample the proportion of malnutrition was presumed to be 50%. Sample size was calculated taking alpha error as 5%, $p = 0.5$, expected deviation as 4%. As per above assumptions the sample size calculated was 600. As per school records, there were 1200 children in the age group of five to eleven years. These were predominantly children in classes I to VI. Three sections were chosen randomly for each class and all children in

these three sections were selected into the study. A total of 760 children were finally included in the study. Qualitative dietary assessment was carried out for the same sample.

Data collection and informed consent

Qualitative diet survey was carried out by oral questionnaire method. The questionnaires were distributed to all parents, after taking their consent and explaining to them the purpose of the study. The method of filling the questionnaire was explained in detail and parents were assured about confidentiality of the contents. The data collected was on the food habits, frequency of various types of food eaten and the preferences/dislike to various food items. The dietary patterns were stratified into three groups of vegetarians, non-vegetarians and egg vegetarians on the basis of animal food intake (red meat/poultry/fish/egg). Vegetarians did not consume any animal food in their diet ever. The non-vegetarians consumed all forms of animal food and the egg vegetarians did not consume any animal food except for egg. Milk was not considered an animal food for the purpose of this study.

Data entry and analysis

The quantitative data was collected from this self-administered questionnaire were entered and analyzed using Epi Info (version 6.04d) software.⁷ The data was cleaned, checked for discrepancies, and rectified where necessary.

RESULTS

Table 1 shows the baseline characteristics of the children included in the study. Out of the 760 children studied, 359(47.23%) were females and 401 (52.77%) were males. The mean weight of boys was 25.1 kg (SD= 2.66) and the mean weight of the girls was 25.63 kg; (SD =3.80), however this difference was not found to be significant ($t=2.2$ $p=0.98$). The children were homogeneously distributed with respect to mother's education status. 262 children (34.49%) had mothers who were graduates and beyond, while 59 (7.76%) of the mothers were educated till primary, none of the mothers were illiterate. The children were homogeneously distributed with respect to the family size. Majority of children, 159 (70.26%) were living in families which had 4 to 5 members. The children were homogeneously distributed with respect to socioeconomic status, as the school was catering only to children of central government employees hence social and economic conditions of the families was comparable.

Table 2 shows the food habits of the children. 421(55.40%) of the children were non vegetarians while least number of children (6.71%) were pure vegetarians.

Table 3 shows the frequency of consumption of the different food items. Majority of girls (70.40%) and boys (71.07%) consumed milk and dairy products daily. However green leafy vegetables were consumed by most of the children only once a week (51.53% girls and 54.11% boys). Fruits were consumed by most of the children two to six times a week (59.88% girls and 63.84% boys). Among those consuming non vegetarian diet, the majority consumed it once a week. Higher

educational status of mother or smaller family size was not significantly associated with greater frequency of consumption of any particular food item (not in table).

Table 4 and 5 show the most and least preferred food items. Though most of the children consumed milk and dairy products daily, it was ranked as the least preferred item. Snacks and fast food was the most preferred food item.

Table 1: Baseline characteristics of the children.

Characteristics	Girls	Boys	Total
Total sample	359 (47.23%)	401 (52.77%)	760 (100%)
Mean weight kg (SD)	25.63(3.80)	25.1(2.66)	
Mothers education status	Girls	Boys	
Primary	27 (7.52%)	32 (7.78%)	59 (7.76%)
Middle School	43 (11.97%)	53 (13.21)	96 (12.63%)
High School	88 (24.51%)	92 (22.94%)	180 (23.68%)
Intermediate	72 (20.05%)	91 (22.69%)	163 (21.44%)
Graduation and beyond	129 (35.95%)	133 (33.18%)	262 (34.49%)
Total	359 (100%)	401 (100%)	760 (100)
Family Size (members)	Girls	Boys	
3	70 (19.49%)	89 (22.19%)	159 (20.92%)
4-5	265 (73.83%)	269 (67.09%)	534 (70.25%)
>5	24 (6.68%)	43 (10.72%)	67 (8.82%)
Total	359 (100%)	401 (100%)	760 (100)

Chi-square=1.51,
df=4; p>0.05

Chi-square=14.29;
df=2; p=0.067

Table 2: Distribution of children according to dietary patterns

Food Habit	Girls	Boys	Total
Vegetarians	21 (5.85%)	30 (7.48%)	51 (6.71%)
Egg vegetarians	138 (38.44%)	150 (37.41%)	288 (37.89%)
Non vegetarians	200 (55.71%)	221 (55.11%)	421 (55.40%)
Total	359 (100%)	401 (100%)	760 (100%)

Chi-square =0.8;
df=2; p=0.66

Table 3: Distribution of children according to variety and frequency of foods eaten.

Frequency	Fruits			Green Leafy vegetables			Milk and Dairy Products			Fish and Meat products		
	Girls	Boys	Total	Girls	Boys	Total	Girls	Boys	Total	Girls	Boys	Total
Rare	0	0	0	20 (5.59%)	16 (3.99%)	36 (4.73%)	0	0	0	10 (5%)	16 (7.23%)	26 (6.17%)
once a week	47 (13.09%)	25 (6.23%)	72 (9.47%)	185 (51.53%)	217 (54.11%)	402 (52.89%)	4 (1.11%)	10 (2.49%)	14 (1.84%)	86 (43.0%)	96 (43.43%)	182 (43.23%)
2-6 times a week	215 (59.88%)	256 (63.84%)	471 (61.97%)	132 (36.76%)	150 (37.40%)	282 (37.10%)	30 (8.35%)	21 (5.23%)	51 (6.71%)	64 (32%)	72 (32.58%)	136 (32.30%)
Daily	82 (22.84%)	100 (24.93%)	182 (23.94%)	22 (6.12%)	18 (4.5%)	40 (5.26%)	253 (70.40%)	285 (71.07%)	538 (70.78%)	32 (16%)	25 (11.31%)	57 (13.59%)
2-3 times a day	15 (4.17%)	20 (5%)	31 (4.60%)	0	0	0	72 (20.14%)	85 (21.21%)	157 (20.65%)	8 (4%)	12 (5.45%)	20 (4.75%)
Total (100%)	359	401	760	359	401	760	359	401	760	200	221	421

Table 4: Most preferred (favourite) foods.

Most preferred	No of children
Snacks and fast food	601 (79.07%)
Indian Sweets	90 (11.84%)
Non vegetarian food including egg	42 (5.52%)
Fruits	27% (3.57%)
Total	760

Table 5: Least preferred foods.

Least preferred	No of children
Milk	550 (72.36%)
Vegetables (green leafy)	152 (20%)
Rice	40 (5.26%)
Dal (Pulses)	18 (2.38%)
Total	760

DISCUSSION

In the present study, 55% of the children were non vegetarians and only 6% were vegetarians. Analysis of the food preferences revealed that majority of children disliked milk the most, followed by green leafy vegetable. However 70% of children took milk daily, probably indicating parental persuasion and also the importance that Indian parents place on milk being a part of the childrens' diet. Majority of children in our study (52.89%) consumed green leafy vegetables once a week and only around 5% consumed it daily and around 20% children in our study consumed fruits daily. In our study, almost 80% of the children preferred Indian and Western snacks and this indicates the ever-growing trend of children preferring processed food and sweetened beverages. In our study, the mother's educational status or family size was not significantly associated with the frequency of consumption of any particular type of food items.

In a study carried out in Bahrain, intake of milk and dairy was observed in 50% of the children while 25% of the school children had a daily consumption of fruits and vegetables.⁸

In certain other studies carried out in Dhaka Bangladesh and rural Kenya, milk was completely missing from the diets of the school going children.^{9,10}

A study carried out in Taiwan among schoolchildren aged 6–9 and 10–12 years, documented low intake of fruits, vegetables, cereals/grains, and dairy products, but high intake of the protein-rich foods, salt/sauces, and fats/oils.¹¹ In a study carried out in Ghana among adolescents, fruits were rarely eaten by 56% and vegetables were rarely eaten by 48% of the study subjects surveyed.¹²

A study carried out on the dietary patterns of adolescent girls in Varanasi city of India, revealed that only one in

ten girls (10%) consumed green leafy vegetables on a daily basis and almost the same percentage of girls consumed fruits on a "regular basis" and consumption of fast food was found to be high.¹³

In a study carried out in Bangladesh on the dietary patterns of adolescent girls, it was revealed that a substantial proportion of the girls did not consume eggs (26%), milk (35%) or dark green leafy vegetables (20%).¹⁴

In a study carried out in Baroda city of India, school children in the age group of 10-19 years were asked about their dietary intake in the preceding 24 hours and their food preferences. Fruits and vegetables were food items the adolescents claimed they tend not to eat while fast food and snacks were foods they tend to consume while 50% admitted to consuming packaged food /beverages like chocolates and soft drinks and 30 % had consumed fast food in the preceding 24 hours.¹⁵

In a similar study carried out amongst Malaysian school children 31% consumed milk and dairy products daily while around 20% consumed vegetables daily and 30% of the children consumed fruits daily.¹⁶ Nearly 60% of them preferred fried food like hamburger and fries despite knowing that these were unhealthy food preferences. A similar finding was also reported from a study carried out in Korea where it was noted that school children in both urban and suburban areas preferred fast foods like pizzas.¹⁷

In our study the mother's educational status was not found to be significantly associated with the frequency of consumption of any particular food item. This could probably be because the children were homogenously distributed with respect to mother's educational status. In several other studies, mother's educational status and knowledge about nutritional content of food has been found to be significantly associated with greater consumption of healthier food items among the children.¹⁸⁻²⁰

Limitations

Our study has certain limitations. As data was collected from parents of school children in the age group of 5yrs-11 years hence it is representative of only the primary school children and not children of all school going ages. Further, as the questionnaire was a self administered one, it is possible that the responses of the parents do not reflect the actual eating habits and preferences of their children. We only collected responses from the parents however had we collected response from the children too, this would have added to the study. Another limitation of this study was that it is possible that the parents did not correctly recall the frequency or the dietary preferences of the children.

CONCLUSION

In developing countries diets of school children are limited in diversity. Our study shows that school going children prefer processed “snack” food items while dairy products especially milk and green leafy vegetables are disliked by them. Fruits and green leafy were consumed daily by 20% and 5% of the children respectively while 70% of the children consumed milk daily despite it being one of the most disliked food items. This is pertinent as it indicates that parents can coerce or persuade their children into consuming food items they feel is beneficial for their health. Diets of children contain more of calorie rich processed food and less of fruits, vegetables and animal foods. This usually leads to a deficiency of micronutrients. Food habits acquired during childhood persist into adulthood and for the basis for either good health or ill health, as the case may be, in the coming years. Hence there is a need to educate parents, especially in the middle and higher socioeconomic groups regarding correct dietary habits for the children to ensure that they can live healthy and productive lives as adults.

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