

Nutritional Assessment of School Going Female Students of Age 8 - 16 Years

Anam Amin^{1*}, Khadija Tariq¹, Javeria Khalid², Anam Tariq³, Munazza Mehboob² and Faran Khan^{3,4}

¹Department of Human Nutrition and Dietetics, Hussain College of Health Sciences, Pakistan

²Department of Food Science and Human Nutrition, University of Veterinary and Animal Sciences, Pakistan

³Department of Nutrition and Dietetics, School of Health Sciences, University of Management and Technology, Pakistan

⁴Department of Clinical Services, School of Health Sciences, University of Management and Technology, Pakistan

***Corresponding Author:** Anam Amin, Department of Human Nutrition and Dietetics, Hussain College of Health Sciences, Lahore, Pakistan.

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Abstract

Nutritional assessment includes collecting, integrating and analyzing nutrition related data. It's the current body status of a person or a population group related to their state of nourishment. The aim was to identify the causative factors of malnutrition and to prevent female adolescents from double burden of disease. This is the descriptive cross sectional study conducted on the female adolescent girls of the different government schools of the Lahore, Punjab. This survey includes both qualitative and quantitative research. This research method includes the dietary assessment of the adolescents including the demographic data. For data collection, semi structured questionnaire was designed and distributed among students. The questionnaire included simple and food frequency questions. The questions were about the dietary intake, height, weight and MUAC of students. The questionnaire also included demographic questions. Weight and height is measured through weighing machine and stadiometer respectively. Food frequency questionnaire has been developed to assess the dietary intake of the adolescents by including the different questions of the food groups. 73% have normal BMI 6% are underweight, 13% are overweight and 6.5% are obese. The majority of the students have their breakfast and aware of the importance of breakfast as it is the motor meal of the day. We concluded that double burden of disease is becoming the major concern of under developed countries as data indicated that students are more exposed towards overweight and obesity range than underweight. It has been found that the majority of students taking breakfast on daily basis but unaware of the healthy food choices.

Keywords: Nutritional Assessment; Nutrition Related Data; Nutritional Screening

Introduction

Nutritional assessment includes collecting, integrating and analyzing nutrition related data. It's the current body status of a person or a population group related to their state of nourishment [1,17]. It's the complex interaction between internal and external environmental factors. Various tools like growth charts and nutritional screening are used for nutritional assessment. Nutrition assessment begins with a history and physical examination. The data for a nutritional assessment consists of anthropometry, biochemical, clinical and dietary. The assessment leads to the process of health care and intervention of nutritional status of an individual. Anthropometric measurements

are the objective measurements of body fat and muscles. These are basically used to compare the height and weight of individuals and to assess weight loss and gain in mature individuals [2].

The most frequently used measurements are weight and height but skin fold measurements from many other parts of the body are also taken. In 1836, tables have been developing to compare weight and height to provide a reference of an individual health status. Skin fold measurements are used to estimate body fat from different areas of body skin fold calipers are used for these measurements [3]. Bio-chemical data includes laboratory tests based on blood and urine that are important indicators of nutritional status. Clinical data provides information about the medical history of an individual including acute and chronic illness, therapies, treatments and malabsorptive disorders. Physical signs of malnutrition can be documented during interview and it's an important part of assessment process. Dietary intake data includes the food items that are eaten in last 24 hrs. That gives the information about the food an individual ate in previous day. Food frequency questionnaire is also used to gather information on how often a specific food is consumed by an individual [4].

From the past few decades there's an increased malnutrition in adolescents due to inadequate food intake and poor dietary habits. This is the critical time period of all age groups, which will further support the development and growth of the children. At this stage, adolescents are more prone to poor dietary habits [5]. According to the WHO, the school going children and adolescents are more prevalent to the obesity and overweight. This is due to the poor dietary habits and the increased intake of the unhealthy food. Obesity will further leads to the metabolic disorders in later life. In addition to this, this will also has a poor impact on the cognitive, social and the economic development of the children [6]. So, there is a significantly need to assess the nutritional status of the school going children especially adolescents. This will ultimately help to prevent them from double burden of disease and other complications in older age [7].

Aim of the Study

The main aim was to identify the causative factors of malnutrition and to prevent female adolescents from double burden of disease.

Methodology

Study design

This is the descriptive cross sectional study conducted on the female adolescent girls of the different government schools of the Lahore, Punjab. This survey includes both qualitative and quantitative research. This research method includes the dietary assessment of the adolescents including the demographic data.

Sample size

The sample size of the study was calculated by keeping the confidence level at 95% (1.96), margin of error at 5% and assumes a population proportion is 0.5, by keeping in mind the above assumptions the sample size calculated was 384 children.

$$n = z^2 \times \hat{p} (1 - \hat{p}) / e^2$$

$$n = 1.962 \times 0.5 (1 - 0.5) / 0.052$$

$$n = 384.16.$$

Study sight

The study was conducted in Lady Maclagan Girl High School, Adabistan e Sophia, Madrasa tul binad and Queen marry girls school in Lahore, Punjab. The study population was female adolescents.

Sampling frame

This study was conducted for the nutritional assessment of the female adolescents (8-16 yrs.).

Study oversight

The study was approved by the Department of Food Science and Human Nutrition, University of Veterinary and Animal Sciences, Lahore. In order to ensure transparency upholding of the highest ethical standards.

Tools for data collection

For data collection, semi structured questionnaire was designed and distributed among students. The questionnaire included simple and food frequency questions. The questions were about the dietary intake, height, weight and MUAC of students. The questionnaire also included demographic questions. Weight and height is measured through weighing machine and stadiometer respectively. Food frequency questionnaire has been developed to assess the dietary intake of the adolescents by including the different questions of the food groups. 24 hour dietary recall has been recorded by asking the questions related to their previous intake of the meals. Body mass index has been calculated for the assessment of any health related problem.

Data collection

A questionnaire was developed and distributed among university students. The questionnaire was distributed females students. Some respond well and some students took it just for granted. The questionnaire was collected from them at the spot and the answers were given to their queries and problems if they had any. The inclusion criteria of the adolescents aged 8 to 16 years females. The exclusion criteria of this study are all the males or the adolescents who are suffering from the Type I diabetes, polio and thyroid dysfunctions. A questionnaire has been recruited in the different schools and assessments have been taken individually by the standard procedures of weight and height. Further, BMI is calculated according to the weight and height by using the formula. Ffq has been administered which has been used to assess the dietary habits and the food choices of the adolescents 24 hour dietary recall is conducted to estimate the calorie intake and the timings of the meals. Primary outcome of the study is the dietary habits and the food choices. Secondary outcome is the assessment of the adolescents by the anthropometric, biochemical, clinical and the dietary methods.

Parameters measured

Anthropometric measurements (height, weight), biochemical data, clinical assessment and dietary data (FFQ and dietary recall) of adolescent girls have been measured.

Ethical approval

Ethical approval has been taken prior from the administration of the different schools and the permissions granted from the parents of the children. Ethical approval was obtained from the Institutional Review Committee for Biomedical Research of University of Veterinary and Animal Sciences, Lahore was also obtained.

Results and Discussion

Overall N = 319 females were included in the study of age group 9-16 years. Most of the individuals 34% have age 11 years and 90% mothers of the participants were working women. Most of the respondents 65% belong to lower middle class and 73% have normal BMI 6% are underweight, 13% are overweight and 6.5% are obese. This indicates the more of overweight and obese students as compare to the underweight and this may be due to the imbalance in energy intake and lack of nutrition knowledge awareness [8,9]. Maximum number of participants do not dine out although the prevalence of eating out has been increased from past few years but it may due to the low income families and most of them play indoor games it may be due to increased usage of electronic devices at home that reduces the trend of outdoor actives and games as presented in table 1 [10,11]. The majority of the students have their breakfast and aware of the importance of breakfast as it is the motor meal of the day. In school break times of students take mid-morning snacks and eat lunch after going back to home. Most of the students also have dinner on daily basis. Smaller number of students take bed time snack overall

the frequency of having major meals is satisfactory but the quality of the meal is also an important factor to determine the health quality [12] as shown in figure 1 and 2.

Variables	Percentage %
Age of students	
9 years	2
10 years	12
11 years	34
12 years	30
13 years	20
14 years	5
15 years	2
Mother's profession	
House wife	90
Working women	10
Social group of students	
Lower class	20
Lower middle class	65
Middle class	15
BMI Percentile	
Underweight	6
Normal	73
Overweight	13
Obese	6.5
Dine out	
Yes	16.5
No	83.5
Physical activity	
Indoor games	88
Outdoor games	12

	Never	1 time/week	2 times/week	3 times/week	4 times/week	5 times/week	6 times/week	Daily
Breakfast	7.5	5.5	3.0	3.5	.5	4.0	3.0	73.0
Mid-Morning Snack	13	5.0	4.0	7.0	2.5	6.0	6.5	56.0
Lunch	1.5	3.0	5.5	4.0	5.0	12	2.5	66.5
Mid-Evening Snack	18.5	5.5	9.5	7.0	12.5	10.0	3.0	3.4
Dinner	1.0	3.0	4.0	5.0	5.5	4.5	5.5	71.5
Bedtime Snack	27.5	8.0	11.5	9.5	3.5	6.0	2.0	32.0

Table 1: Demographic data and nutritional assessment.

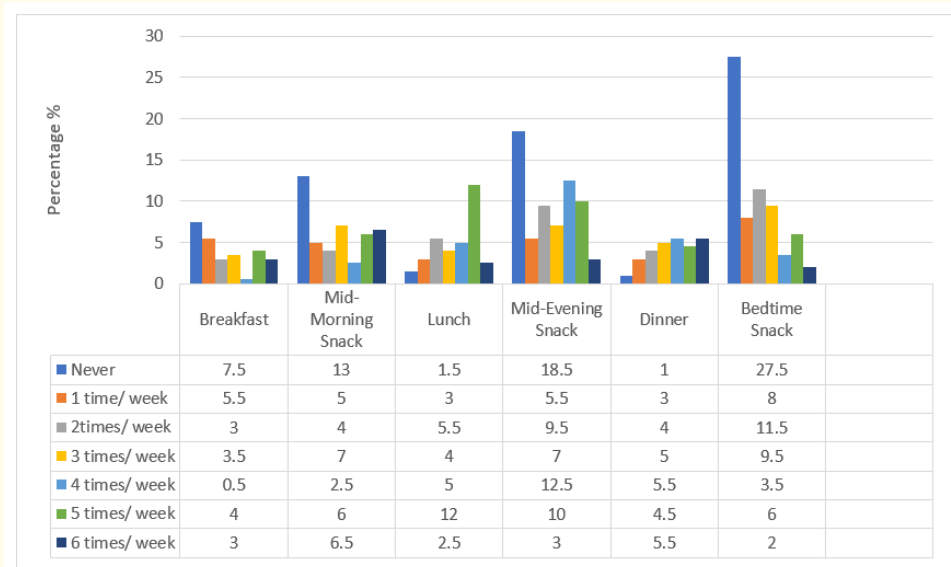


Figure 1: Intake per week.

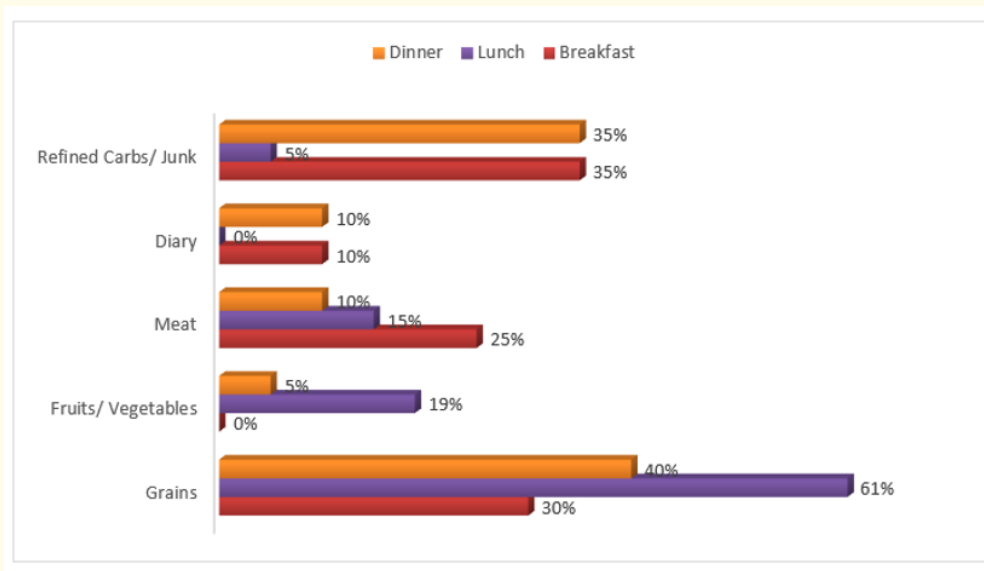


Figure 2: Dietary assessment.

The analysis of food frequency assessment reveals that the most commonly preferred item by the students is chapati and white bread for major meals. Biscuits, rusk, rice, pasta and beans are also consumed items on daily basis. In meat group egg is the most common edible

item for obtaining protein, chicken is also consumed on the 2nd most preference. Dairy products are consumed in a handsome amount; in the form of milk, yogurt, ice cream and least consumption from the cheese. Fruits and vegetables consumption is inadequate among students and this may be due to the lack of nutrition education among students and parents that it's an important source of antioxidants for minimizing the oxidative stress in the body [13]. Garden-based nutrition education programs can enhance the fruits and vegetable exposure and improves the intake by observatory and learning process [14]. Chocolates and candies, carbonated beverages and tea are consumed in fair amount on daily basis and this may be liked with the poor dietary choices and obesity in later ages of life among them [15,19]. Fast food is also consumed on daily basis in on or another form as shown in table 2.

	Never	1 T/W	2 T/W	3 T/W	4 T/W	5 T/W	6 T/W	Daily
Bread and Cereal Products								
Bread	6.0	18	10.5	10.5	9	5.5	6.5	34
Roti	5.0	17.5	5	8.5	5	6	4	43
Nan	9.0	27.6	14.6	11.1	10.6	6.5	4.5	12.6
Paratha	6.0	27.6	14.6	11.1	8.5	9	5	22.5
Biscuits	9.0	21	10.5	8.5	12.5	5	5	4.5
Rusk/Papay	17.1	33.7	10.1	8.5	8.5	3	3.5	14.1
Rice (Any form)	6.5	21.5	15	13.5	10.5	6	13	2
Porridge	38.7	25.6	9.5	7	3.5	3.5	4	7
Pasta, noodles, Spegatties	14	24	18.5	11	3	8	3.5	16
Beans/legumes/pulses/lentils	17	27.5	16.5	13.5	8.5	6	3.5	6.5
Meat and Meat Products								
Egg (any form)	10	25	18.5	18.5	8.5	4	5	19
Chicken (any form)	7.5	17.5	18	14.5	14	3.5	8	16
Beef and Mutton (any form)	21.5	25.5	19.5	10.5	15	3	3	19
Fish (any form)	25	26.5	11.5	7	7.5	6	2.5	10
Milk and Dairy products								
Milk (any form)	9.5	20	4	9	4	3.5	4	44.2
Yogurt (any form)	13	22.5	14	11.5	8	5	4	19.5
Cheese (any form)	27	20	14.5	3.5	4.5	2	13.5	1
Ice cream	5.5	12.6	13.1	16.1	14.1	7	8	21.6
Fruits								
Dry fruits	13.5	18	14	11	10.5	5.5	1.5	1.5
Fresh Fruits	5	10	11.5	12	7	11	6.5	35.5
Fresh fruit juice	6	14	11.5	14.5	9	10	5.5	7.5
Vegetables								
Green Leafy vegetables	21	22	13	12.5	9.5	6.5	3	11
Roots and Tubers	22.5	22.5	14	16.5	6.5	6	3.5	7.5
Cooked Vegetables	14	13.5	14.5	14	8.5	9	15.5	21
Raw vegetables (Salad)	10.5	15.5	18	18.5	7.5	5.5	6	17.5

Sweets and Confectionary								
Chocolate, Candies, Toffies	6	10.5	9	13	6	6	40.5	1
Beverage								
Coke, Pepsi, Sprite, etc.	6.5	19.5	10.5	10	10.5	6.5	5.5	29.5
Tea	15.6	20.1	6.5	13.1	8.5	4.5	3	27.6
Cold drinks (non-carbonated)	9.5	22	1.5	19	7.5	5	3.5	21
Miscellaneous and Fast Food								
Pakoray and Samosay	10.5	20	14	13.5	7.5	7.5	2.5	23
Gol Gappay and Chana chaat	12.6	25.6	12.6	8	9	9.5	4	16.6
Dhai bhalay	11	16.5	19	9.5	15	6.5	6	14
Shawarma	6.5	22	11.5	15.5	12.5	8.5	4.5	18
French fries, chips,	8.5	23	11.5	13	13.5	8	5.5	15.5
Pizza	12.5	27.5	14	13	7.5	5.5	5	12.5
Burger	11	28.5	16.5	13	5.5	4.5	5.5	14
Milk shake	10.1	18	12.5	11.5	9	5.5	5	2.7
Others	67.5	13	7	3	2	1	5.5	0.5

Table 2: Food frequency questionnaire.

Dietary assessment of participants was done by using subject assessment method to assess intake of different food groups and these groups were compared for breakfast, lunch, and dinner as presented in figure 2. Mostly students have refined carbohydrates in their breakfast in the form of white bread, rusk and biscuits that shows that children starting their day with the energy of carbohydrates whereas in lunch grains are consumed in higher percentage but in dinner the consumption of fast food is the highest this may be due to exposure of child targeted fast food commercials on televisions and on social media that urges to eat more from the junk group and positively affects the consumption of fast food by the school students [16-18].

Conclusion

By interpreting and analyzing the data of this study we concluded that double burden of disease is becoming the major concern of under developed countries as data indicated that students are more exposed towards overweight and obesity range than underweight. It has been found that the majority of students taking breakfast on daily basis but unaware of the healthy food choices. Children are consuming more amounts of cereals on daily basis while their meat consumption is very low and consume eggs as basic source of proteins that can lead to anemia and cognitive disabilities. The intake of antioxidants is also very low due to not having fruits and vegetables in an appropriate amount. Students are not aware of unhealthy and healthy foods like sweets and carbonated beverages. Study also reveals that their economic status affects the eating habits of school going children as the students mostly rely on biscuits and chips for snacks. Students preferred junk food in the school break times. Most of the students like to consume shawarma, burger and carbonated drinks and other fast foods and mostly consumed in replacement of dinner. This study highlights the need of introducing nutrition education programs in school age students to enhance their knowledge regarding healthy food choices.

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Conflict of Interest

Authors described no conflict of interest.

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