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Assessment of Nutrient Intake and Food Consumption Patterns in Relation to Obesity among Adolescent Girls in a Kashmir University (School).

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Abstract:

Background: Adolescent obesity is an emerging public health concern influenced by unhealthy dietary habits and sedentary lifestyles. **Objectives:** The present study aimed to assess the Nutrient intake and food consumption patterns in relation to obesity among high school girls or Adolescent girls aged 14–16 years studying at Model High School, University of Kashmir. **Material and Methods**: A cross-sectional study was conducted among 50 adolescent girls selected through random and purposive sampling techniques. Dietary intake of energy, protein, fat, and fiber was assessed using the 24-hour dietary recall method, and food frequency questionnaires were used to evaluate habitual food consumption patterns. **Result:** The findings revealed that the mean intake of energy, protein, and fat among the respondents exceeded the ICMR Recommended Dietary Allowances, whereas fiber intake was markedly below the recommended levels. Food frequency analysis showed a high consumption of energy-dense foods such as butter and ghee, frequent intake of chicken and eggs, and greater consumption of roots and tubers, particularly potatoes, while the intake of fruits, green leafy vegetables, and pulses was comparatively low. **Conclusion:** The study concludes that excessive consumption of calorie-dense foods combined with inadequate fiber intake and poor dietary diversity may contribute to obesity among high school girls, highlighting the need for nutrition education, balanced dietary practices, and promotion of healthy lifestyles to prevent adolescent obesity.

Keywords: Adolescent, obesity, dietary assessment, nutritional requirement, dietary factors, 24-hour dietary recall, food frequency, nutrient intake.

INTRODUCTION:

Nutrition plays a fundamental role in human health, defined as the process through which food is ingested, absorbed, and utilized by the body to support growth, development, and overall physiological function. Adequate nutrition – comprising a balanced intake of macronutrients, micronutrients, and dietary fiber- combined with regular physical activity, forms the cornerstone of disease prevention and health promotion across all life stages **(Naveen, 2008).**During adolescence, nutritional requirements are particularly elevated due to rapid physical growth, hormonal changes, and the development of lifelong dietary habits that influence long term health outcomes. Unfortunately contemporary dietary patterns among adolescents have increasingly deviated from recommended guidelines, characterized by excessive consumption of energy dense nutrient-poor foods and insufficient intake of fruits, vegetables, wholegrains and fiber **(Joshi et al., 2014).**

Obesity is a complex multifactorial disorder characterized by excessive accumulation of body fat that adversely affects health. It is clinically defined by a body mass index (BMI) of > 30 kg/m^2, with the range of 25 – 30 kg/m^2 classified as overweight **(Purnell 2023).**Historically, obesity was associated with prosperity and wealth, but modern perspectives recognize it as a serious public health crisis linked to numerous chronic diseases including type 2 diabetes, cardiovascular disease, certain cancers, and musculoskeletal disorders **(Haslam, 2007; Christopoulou-Aletra and Papavramidou, 2004).** The etiology of obesity involves an intricate interplay of genetic predeposition, environmental factors, sedentary lifestyle, and most prominently dietary behavior's characterized by energy imbalance **(Sahoo et al., 2015).**

Adolescent obesity has emerged as a particularly concerning public health issue globally, with prevalence rates rising dramatically over recent decades. Studies indicate significant gender differences in obesity patterns and risk factors among adolescent. **Wang et al.,(2018)** observed that adolescent boys were twice as likely to be obese compared to girls, with boys demonstrating higher energy intake, greater satisfaction with physical activity levels, and tendency to underestimate body weight. Conversely, adolescent girls were more likely to engage in weight loss behaviors through dietary restriction and demonstrated higher rates of self-perceived obesity. Regional studies from India have documented obesity prevalence rates ranging from 7.6% to 12.4% among high school children, with rates influenced by parental education, socioeconomic status, parental obesity and lifestyle factors **(Sarvamangala et al., 2017; Winkvist et al., 2015).Chandrakala and Soumya (2016)** specifically noted higher prevalence of overweight and obesity among adolescent girls in tertiary hospital settings, underscoring the need for targeted interventions in this demographic. Multiple dietary factors have been implicated in the development of adolescent obesity.The proliferation of fast food consumption, particularly among dual- income families, has contributed significantly to excessive caloric intake with minimal nutritional value **(Andegiorgish et al., 2012)**. Sugar sweetened beverages represent another major contributor, with their high caloric contributor, with their high caloric density and low satiety value promoting

positive energy balance weight gain over time **(Borraccino et al., 2016).** The consumption of energy dense foods has ben inversely associated with intake of fruits and vegetables across both sexes and all age groups, with the relationship being particularly pronounced among normal weight adolescents, suggesting that dietary patterns precede rather than merely accompany obesity development. Beyond dietary intake, sedentary lifestyle patterns have been identified as a crucial risk factor for adolescent obesity **(Sahoo et al., 2015).** Neumark-**Sztainer et al. (2003)** demonstrated that frequency of family meals was positively associated with consumption of fruits, vegetables, wholegrains and calcium rich foods, while being negatively associated with soft drink consumption.

The nutritional requirements during adolescence are elevated and age-specific, governed by basal metabolic rate, physical activity level, and the demands of pubertal growth and development. Energy requirements vary substantially based on sex, growth velocity, and activity patterns, necessitating individualized dietary recommendations rather than one size fits all approaches. Protein needs are determined by requirements for maintenance of existing lean body mass plus accretion of new tissue during growth spurts. Dietary fat serves multiple critical functions including energy provision, structural components of cell membranes, precursors for metabolic regulatory molecules, and gene expression regulation. Fiber intake derived primarily from fruits, vegetables, wholegrains and legumes is essential for gastrointestinal health, satiety regulation and metabolic homeostasis, yet remains consistently inadequate in adolescent diets globally **(Joshi et al., 2014).**

Therefore, the present study was undertaken to comprehensively assess dietary intake of energy, protein, fat, and fiber using 24 hour dietary recall methodology, and to assess food consumption patterns through food frequency questionnaires among adolescent girls aged 14-16 years attending Model High School at the University of Kashmir.By quantifying nutrient intake relative to Indian Council of Medical Research (ICMR) recommended dietary allowances and characterizing habitual food consumption patterns, and characterizing habitual food consumption patterns.

OBJECTIVES:

To assess The Nutrient Intake (24- Recall Method) of respondents.

To assess the food consumption patterns through food frequency questionnaires among respondents.

MATERIAL AND METHODS

Study Design and Setting

The present cross – sectional study was conducted at Model High School, Naseem Bagh, University of Kashmir, Srinagar, over a period of one month. The study was designed to assess nutrient intake and food consumption frequencies in relation to obesity among adolescent's girls in the age group of 14-16 years.

Sample Selection

A total of 50 adolescent girls aged 14-16 years were selected using a combination of random and purposive sampling techniques. The sample was drawn from students enrolled at Model High School, University of Kashmir, and Srinagar. Participants who were willing to provide complete dietary information and were present during the data collection period were included in the study.

Data Sources

The study utilized both primary and secondary data sources. Primary data were collected directly from the selected participants through structured questionnaire administered by the researcher. Secondary data were obtained from published literature including books, peer-reviewed journals, unpublished dissertations from Iqbal Library and the Institute of Home Science at the University of Kashmir, and relevant online databases to inform the theoretical framework and contextualize findings.

Dietary Assessment Tools

Two complementary dietary assessment methods were employed to capture both quantitative nutrient intake and qualitative food consumption patterns:

24-Hour Dietary Recall: This method was used to collect detailed information about all foods and beverages consumed by the participants during the 24 hours preceding the interview. Trained interviewers guided participants through a systematic recall of their dietary intake, including meal times, portion sizes, cooking methods, and food descriptions. The collected data were subsequently analyzed to estimate daily intake of energy (kilocalories), protein (grams), fat (grams), and dietary fiber (milligrams). These values were compared against age-specific Recommended Dietary Allowances (RDA) established by the Indian Council of Medical Research (ICMR) for girls aged 14-16years.

Food Frequency Questionnaire: A semi-quantitative food frequency questionnaire was administered to assess habitual consumption patterns of major food groups including dairy products (milk, butter, ghee, cheese, curd), vegetables (green leafy vegetables, roots and tubers, other vegetables), fruits (various seasonal and year-round fruits), non-vegetarian foods (chicken, mutton, fish, eggs), and pulses (Bengal gram, green gram, lentils, rajmah, soyabean). Participants reported their typical frequency of consumption for each food item using the following categories: daily, weekly, monthly, or never.

RESULT AND DISCUSSIONS

After collecting the information from the respondents, this was put on a Master Chart and thereafter tabulated, analyzed and interpreted as per the need of the study. Various statistical tests were used to facilitate analysis and interpretation in order to achieve the desired objectives. The present study was undertaken to assess a nutrient intake and food consumption pattern in relation to obesity assessment among high school children or

adolescent girls in a Kashmir university (school). The data from the selected sample was collected through a structured questionnaire in order to gather information related to the study. The interferences drawn from the study are discussed in the following paragraphs

DIETARY ASSESSMENT:

This section represents 24- hour dietary recall in relation to obesity. This section provides necessary information about nutrient intake such calories, protein, fat, fibre by students.

Table no:- 4.1

Consumption of Energy (kcal) per day (24 hour recall).

Age group (in yrs)	Mean Intake	Coefficient of variation	Deviation from ICMR
14-15	2500	11.95	+170
15-16	2550	17.45	+230
16-17	2650	25.5	+210

RDA (14-16yrs):- 2330-2440kcal/d

Table no:-4.2

Consumption of Protein (gm) per day (24 hour recall)

Age group (in yrs)	Mean Intake	Coefficient of variation	Deviation from ICMR
14-15	65	8.95	+13
15-16	75	13.4	+23
16-17	72	11.5	+17

RDA(14-16yrs):- 52.1 – 55.5 gm/d

Table no:4.3

Consumption of Fat (gm) per day (24 hour recall)

Age group (in yrs)	Mean Intake	Coefficient of variation	Deviation from ICMR
14-15	45	4.13	+20
15-16	47	5.51	+22
16-17	40	7.43	+10

RDA(14-16 yrs):-25-30gm/d

Table no:4.4

Consumption of Fiber (mg) per day (24 hour recall)

Age group (in yrs)	Mean Intake	Coefficient of variation	Deviation from ICMR
14-15	10	3.4	-12
15-16	16	5.4	-6
16-17	12	6.54	-13

RDA(14-16yrs):-22-25mg/d

The analysis of nutritional assessment of subjects by 24 hour recall method is shown in table no. 4.1, 4.2, 4.3, 4.4.It was observed that the Mean, C.V and D.ICMR consumption of

Calories (kcal)

(14-15yrs) 2500 (C.V 11.95) (D.ICMR.+170)

(15-16yrs) 2550kcal (C.V 17.45) (D.ICMR +230)

(16-17yrs) 2650kcal (C.V 25.5) (D.ICMR +210)

Protein (gm)

(14-15yrs) 65gm (C.V 8.95) (D.ICMR +13)

(15-16yrs)75gm(C.V 13.4) (D.ICMR +23)

(16-17yrs)72gm (C.V 11.5),(D.ICMR +17)

Fat (gm)

(14-15yrs) 45gm (C.V 8.13) (D.ICMR +20)

(15-16yrs)47gm (C.V 9.51)(D.ICMR +22)

(16-17yrs)40gm (C.V 12.4) (D.ICMR +10)

Fiber (mg)

(14-15yrs) 10mg (C.V 10), (D.ICMR -12)

(15-16yrs) 16mg (C.V 5.4),(D.ICMR -6)

(16-17yrs)12mg (C.V 6.54) (D.ICMR -13)

The calories, protein, fat amount of high school girls were positively deviating and fiber were negatively deviating.

Food Frequency:-

This section represents frequency of food in relation to obesity. This section provides necessary information about the meal pattern of girls, their frequency of consumption of foods.

Table no. 4.5

Dairy product		N	%age
Milk	Daily	0	00%
	Weekly	10	20%
	Monthly	40	80%
	Never	0	0%
Cheese	Daily	9	18.0%
	Weekly	20	40.0%
	Monthly	19	38.0%
	Never	2	4.0%
Curd	Daily	16	32.0%
	Weekly	29	58.0%
	Monthly	3	6.0%
	Never	2	4.0%
Ghee	Daily	44	88%
	Weekly	7	7.0%
	Monthly	0	0%
	Never	0	10.0%
Butter	Daily	50	.100%
	Weekly	0	0%
	Monthly	0	0.0%
	Never	0	0%

Table 4.5 reveals that 100% of respondents consume butter daily.

It is also clear from the table 4.5 that 18% of the respondents consume cheese daily but majority 40% consume it weekly.38% consume cheese monthly. While as 4% of respondents consume cheese never.

Table 4.5 reveals that 32% of the respondents consume curd daily but majority of the respondents 58% consume it weekly. 6% of the respondents consume curd monthly while as 4% of the respondents consume curd never.

Table 4.5 shows that 14% of the respondents consume ghee daily but majority of the respondents (42%) consume ghee monthly. 38% of the respondents consume ghee weekly while as 10% of the respondents consume ghee never.

Table 4.5 shows that 20% of the respondent consume milk weekly and 80% consume milk monthly.

These table also reveals that consumption of butter and ghee was found higher in high school girls.

TABLE NO. 4.6

Vegetables		N	%age
Spinach	Daily	2	4.0%
	Weekly	1	2.0%
	Monthly	5	10.0%
	Never	42	82%
Lettuce	Daily	3	6.0%
	Weekly	2	4.0%
	Monthly	34	68.0%
	Never	11	22.0%
Roots and tubers Potato	Daily	36	72(.0%
	Weekly	2	4.0%
	Monthly	1	2.0%
	Never	1	2.0%
Onion	Daily	24	48.0%
	Weekly	11	22.0%
	Monthly	2	4.0%
	Never	1	2.0%
Cabbage	Daily	2	4.0%
	Weekly	20	40.0%
	Monthly	19	38.0%
	Never	9	18.0%
Peas	Daily	1	2.0%
	Weekly	31	62.0%
	Monthly	16	32.0%
	Never	2	4.0%
Carrot	Daily	7	14.0%
	Weekly	15	30.0%
	Monthly	27	57.0%
	Never	1	2.0%

Table 4.6 represents the frequency of consumption of different vegetables by the subjects. The figure depicted that majority of subjects consume i.e72% roots and tubers such as potato daily as compared to green leafy vegetables and other vegetables.

TABLE NO. 4.7

Apple	Daily	50	100.0%
	Weekly	0	0.0%
	Monthly	0	0.0%
	Never	0	0.0%
Banana	Daily	7	14.0%
	Weekly	36	72.0%
	Monthly	5	10.0%
	Never	2	4.0%
Mango	Daily	1	2.0%
	Weekly	22	44.0%
	Monthly	27	54.0%
	Never	0	0.0%
Orange	Daily	1	2.0%
	Weekly	15	30.0%
	Monthly	34	68.0%
	Never	0	0.0%
Grapes	Daily	0	0.0%
	Weekly	11	22.0%
	Monthly	37	74.0%
	Never	2	4.0%
Pear	Daily	1	2.0%
	Weekly	6	12.0%
	Monthly	40	80.0%
	Never	3	6.0%

Table 4.7 represents that the frequency of consumption of different fruits by subjects. The table revealed that apple were frequently consumed daily as compared to other fruits. It indicates that the consumption of fruits were less by subjects. Majority of the subjects consume fruits weekly and monthly.

TABLE NO. 4.8

Non-veg. foods		N	%age
Mutton	Daily	1	2.0%
	Weekly	39	78.0%
	Monthly	10	20.0%
	Never	0	0.0%
	Daily	36	72.0%

Chicken	Weekly	8	16.0%
	Monthly	6	12.0%
	Never	0	0.0%
Fish	Daily	0	0.0%
	Weekly	10	20.0%
	Monthly	23	46.0%
	Never	17	34.0%
Egg	Daily	28	56.0%
	Weekly	20	40.0%
	Monthly	0	0.0%
	Never	2	4.0%

Table no. 4.8 represents the frequency of consumption of non-vegetarian foods by the subjects. A good percentage of the subject were consumed chicken (72%) and egg (56%) as compared to meat and fish were consumed less frequently by the subjects.

TABLE NO. 4.9

Pulses		N	%age
Bengal gram	Daily	1	2.0%
	Weekly	26	52.0%
	Monthly	16	32.0%
	Never	7	14.0%
Green gram	Daily	1	2.0%
	Weekly	28	56.0%
	Monthly	17	34.0%
	Never	4	8.0%
Rajma	Daily	7	14.0%
	Weekly	38	76.0%
	Monthly	5	10.0%
	Never	0	0.0%
Lentils	Daily	1	2.0%
	Weekly	22	44.0%
	Monthly	23	46.0%
	Never	4	8.0%
Soybean	Daily	0	0.0%
	Weekly	41	82.0%
	Monthly	9	18.0%
	Never	0	0.0%

The frequency of consumption of different pulses by subjects is shown in table no. 4.9. According to the table, Bengal gram and green gram were consumed by 52% and 56% weekly by the subjects whereas rajmah and soyabean were consumed by 76% and 82% weekly by subjects respectively. Lentils were consumed 44% weekly by subjects. Bengal gram, green gram, Rajmah and soyabean were consumed by subjects 2%, 14%, 2% daily. This shows that overall pulses were not consumed frequently still rajmah and soyabean were consumed more than green gram, Bengal gram and Lentils.

CONCLUSION

Obesity is a disorder in which spare fat gets collected in the body. It is generally due to the combination of high consumption of food, physical inactivity and genetic predispositions. Dietary assessment method was used to assess the intake of calories, protein, fat, fiber by the children. The calories, protein and fat Consumption was high in girls and intake of fiber consumption was low that lead to obesity among high school girls. Food frequency method was used to assess the intake of diff. foods. The result depicted that butter and ghee were consumed by majority of girls more frequently among dairy products. The frequency of consumption of fruits by majority of girls was less .Mutton, chicken was consumed frequently by girls. Pulses was consumed less frequently. The increased consumption of energy dense foods that are low in fiber and high in sugar and of sweetened drinks as well as decrease in physical activity and more sedentary lifestyle is the reason of obesity among childrens**.** The study highlighting the need for nutrition education, balanced dietary practices, and promotion of healthy lifestyles to prevent adolescent obesity.

REFRENCES

1. Andegiorgish, A. K., Wang, J., Zhang, X., Liu, X., & Zhu, H. (2012). Prevalence of overweight, obesity, and associated risk factors among school children and adolescents in Tianjin, China. *European journal of pediatrics*, *171*(4), 697-703.

2. Borraccino, A., Lemma, P., Berchialla, P., Cappello, N., Inchley, J. C., Dalmasso, P., Charrier, L., Cavallo, F., & Italian HBSC 2010 Group (2016). Unhealthy food consumption in adolescence: role of sedentary behaviours and modifiers in 11-, 13- and 15-year-old Italians. *European Journal of Public Health*, *26*(4), 650-656.

3. D. Haslam, (2007) “Obesity: a medical history,” Obesity Reviews, vol. 8, supplement 1, pp. 31–36.

4. H. Christopoulou-Aletra and N. Papavramidou (2004), “Methods used by the Hippocratic physicians for weight reduction,” World Journal of Surgery, vol. 28, no. 5, pp. 513–517.

5. . Joshi,M.S., Likhar, S., Agarwal, S.S., Mishra, K.M., Shukla, U. (2014): A study of nutritional status of adolescent girls in rural area of bhopal district, National journal of community medicine, vol.5 NO. 02.

6. Neumark- Sztainer, D., Wall, M. M., Story, M., & Perry, C. L. (2003). Correlates of unhealthy weight-control behaviors among adolescents: Implications for prevention programs. *Health Psychology*, *22*(1), 88–98.

7. Naveen G,(2008).Food and Nutrition for nurses prepared by educational planning, Fourth Edition, pp-4-141.

8. Purnell JQ. (2023).Definitions, classification, and epidemiology of obesity. Endotext. South Dartmouth (MA): MDText.com, Inc., 2000.

9. P., Chandrakala., & A., Saoumya.. (2016). A study of prevalence of overweight and obesity in adolescents. *International Journal of Contemporary Pediatrics*, *3*(3), 960–964.

10. Sarvamangala k.,Koujalgi M.B,(2017):Prevalence of obesity among high school children, department of community medicine,V0l.6-issue 2,pp-1-35.

11. Sahoo, K., Sahoo, B., Choudhury, A. K., Sofi, N. Y., Kumar, R., & Bhadoria, A. S. (2015). Childhood obesity: causes and consequences. *Journal of family medicine and primary care*, *4*(2), 187-192.

12. Winkvist, A., Hultén, B., Kim, J. L., Johansson, I., Torén, K., Brisman, J., & Bertéus Forslund, H. (2015). Dietary intake, leisure time activities and obesity among adolescents in Western Sweden: a cross-sectional study. *Nutrition journal*, *15*(1), 41.

13. Wang,V.H., Min, J., Xue, H., Du, S., Xu, F., Wang , H., & Wang, Y. (2018).What factors may contribute to sex differences in childhood obesity prevalence in china? Public Health Nutrition, 21(11), 2056-2064.