Assessment of Nutritional Intake of College Going Girls

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ABSTRACT

Young women in college represent a unique and transitional demographic, moving from adolescence into early adulthood. This period is marked by rapid physical growth, hormonal fluctuations, increased academic and social demands and a gradual shift towards independent lifestyle choices. Nutritional adequacy during this stage is particularly critical as it influences not only immediate health outcomes such as physical stamina, cognitive performance, reproductive health and immunity, but also long-term well-being, including reduced risk of chronic diseases like osteoporosis, obesity and cardiovascular disorders.

However, multiple factors compromise the nutritional status of college-going girls. Irregular eating schedules, peer influence, easy access to calorie-dense fast foods, inadequate intake of traditional home-cooked meals and limited nutrition knowledge often result in imbalanced dietary patterns. While energy requirements may remain unmet, fat consumption frequently exceeds recommendations, creating a paradoxical risk of both under nutrition and lifestyle-related disorders. Additionally, deficiencies in key micronutrients such as iron, calcium and vitamins remain highly prevalent in this group, exacerbating the risk of anemia, poor bone health, and impaired immune defense.

The present study was designed to evaluate the dietary intake of college-going girls and compare it with the Recommended Dietary Allowances (RDA) outlined by the Indian Council of Medical Research National Institute of Nutrition (ICMR-NIN, 2020). Using one-sample t-tests, the study analyzed whether deviations between actual intake and RDA were statistically significant. The results revealed significant inadequacies in energy, protein, iron, calcium, vitamins A, vitamin C and dietary fiber, coupled with excessive fat intake. These findings highlight alarming nutritional gaps in this population and emphasize the need for immediate nutrition-focused interventions, including awareness programs, dietary counseling, and policy level strategies in higher education institutions. In conclusion, despite of the fact that the sample size of the study is too small; a larger

sample size is needed to draw any firm conclusions, this study underscores that improving the dietary practices of college-going girls is essential not only for their immediate well-being but also for safeguarding the health of future generations.

Keywords: Nutritional intake, College Going Girls, RDA (Recommended Dietary Allowances)

INTRODUCTION

Nutrition in adolescence and early adulthood serves as a foundation for both immediate well-being and long-term health outcomes. Adequate nutrition during this stage not only supports growth and maturation but also plays a vital role in reproductive health, hormonal regulation, cognitive performance and the prevention of chronic diseases such as obesity, diabetes, cardiovascular disorders and osteoporosis in later stages of life. For young women, particularly those in college, optimal dietary intake is essential to meet the dual demands of physiological needs and academic productivity.

College-going girls, generally between the ages of 17–22 years, often experience a critical lifestyle transition as they move away from family-regulated eating habits to self-directed choices. During this period, dietary practices are shaped by a range of factors including irregular meal timings, dependence on hostel or canteen food, increased fast-food consumption, peer pressure, limited time for meal preparation and sedentary lifestyles associated with long study hours or reduced physical activities. These lifestyle behaviors, compounded by socio-economic constraints, frequently result in poor diet quality[1].

Evidence from both national and international studies highlights widespread deficiencies in essential nutrients among adolescent and young adult females. In India, low intake of iron, calcium, vitamin A and vitamin C remains a persistent problem, contributing to nutritional anemia, impaired bone mineralization, weakened immunity and poor overall health outcomes[1,2]. These inadequacies are particularly concerning because young women are at the threshold of their reproductive years and poor nutrition during this period not only impacts their health but also has intergenerational consequences by influencing maternal and child health outcomes.

Despite being relatively more educated than other groups, college girls are not immune to dietary mismanagement. Studies suggest that nutritional awareness does not always translate into healthy eating practices, especially when convenience, affordability and social influences dictate food choices. Additionally, the nutrition transition in India,

characterized by the replacement of traditional, nutrient-dense diets with energy dense, processed foods, further aggravates the problem, leading to a paradoxical situation of simultaneous under nutrition and over nutrition.

In this context, assessing the dietary intake of college-going girls becomes crucial to identify existing nutritional gaps and risk factors. Comparing actual consumption with the Recommended Dietary Allowances (RDA) provided by ICMR-NIN (2020)[3] helps in quantifying the severity of inadequacies. Furthermore, applying statistical analysis such as t-tests provides scientific rigor in determining whether the observed differences are significant and not merely due to random variation.

The present study, therefore, aims to comprehensively evaluate the dietary intake patterns of college-going girls, compare their nutrient consumption with established RDA standards and statistically analyze the deviations. By doing so, the research seeks to highlight critical areas of concern and provide evidence-based insights that can inform targeted nutritional education programs, campus-level dietary interventions and broader policy measures to improve the health and well-being of young women.

RESEARCH METHODOLOGY

The study was conducted at Dayanand Mahila Mahavidyalaya, Kurukshetra (Haryana, India)*,* with the aim of assessing dietary intake among young girls'. A sample of 20 college-going day scholar girls of 19-20 years of age was selected using a random selection method to ensure unbiased participation. Prior to inclusion in the study, each participant was informed about the objectives, procedures and written consent was obtained, ensuring adherence to ethical considerations. Firstly, their Height, Weight and BMI (Body Mass Index) were noted down.

Dietary assessment was carried out using the 24-hour dietary recall method for three consecutive days during which participants reported all food and beverage consumption, including portion sizes and preparation methods. To improve accuracy, standard household measures (cups, spoons, bowls) were used as references. The collected dietary data were analyzed using the Indian Food Composition Tables (ICMR-NIN, 2020)[3] to calculate daily nutrient intakes, including energy, protein, fat, iron, calcium, vitamin A, vitamin C and dietary fiber.

The obtained values were compared with the Recommended Dietary Allowances (RDA) for Indian women aged $\geq$19 years (ICMR-NIN, 2020). A one-sample t-test was applied to examine whether the differences between actual nutrient intake and the RDA were

statistically significant. Data were expressed as Mean ± Standard Deviation (SD) and a p-value of ≤ 0.05 was considered significant.

RESULTS & DISCUSSION

The mean age of the college-going girls was 20 ± 1.1 years**,** which places them in late adolescence to early adulthood, a crucial stage of life characterized by rapid physical growth that requires optimum nutrition intake. At this age, young women are at the threshold of their reproductive years, making adequate nutrition vital not only for their own health but also for their future maternal health outcomes.

The mean body weight of the participants was 45 ± 6.7 kg**,** which is lower than the expected average weight for this age group according to national growth standards. This suggests a tendency towards under nutrition or inadequate energy intake, which was later reflected in the dietary analysis. The mean height of the sample was 1.57 ± 6.8 m**,** aligning reasonably with the average height of Indian women in this age category, though the wide standard deviation indicates variability in growth patterns likely influenced by genetics, lifestyle and early childhood nutrition.

The mean Body Mass Index (BMI) was 21.23 ± 4.56 kg/m²**,** which falls within the World Health Organization's (WHO) classification of a normal weight range (18.5–24.9 kg/m²). However, the relatively high standard deviation suggests that while some participants maintained a healthy BMI, others may have been either underweight or overweight. This diversity within the sample highlights the dual burden of malnutrition often observed in Indian youth, where under nutrition coexists with emerging overweight and obesity due to changing dietary habits and sedentary lifestyles.

Table 1: Demographical Profile of the College Going Girl's (n=20)

Demographic Profile	Mean ± Standard deviation
Age (years)	20± 1.1
Weight(kg)	45± 6.7
Height (m)	1.57± 6.8
BMI (kg/m^2)	21.23±4.56

Table 1 presents the comparison of mean nutrient intake of college-going girls with the Recommended Dietary Allowances (RDA) as per ICMR-NIN (2020)[3]. The results show significant deviations across almost all nutrients studied.

The mean energy intake of the participants was 1059.35 ± 0.996 Kcal, which was significantly lower than the RDA of 1660 Kcal (t = -8.42, p ≤ 0.05). The results of the present study indicate a marked inadequacy in energy intake among the participants. This shortfall may be attributed to irregular eating habits, frequent skipping of meals especially breakfast and reliance on poor-energy, convenience-based foods. Studies in similar populations have also reported low energy intake, linking it to academic stress, irregular routines and socio-cultural influences on diet[4]. Inadequate energy intake in young women can lead to reduced physical endurance, compromised immunity and impaired academic performance due to poor concentration[5]. Prolonged energy deficits may also predispose young women to low body weight, hormonal disturbances and menstrual irregularities.

Protein intake of the subjects was only 30.03 ± 123.0 g, falling significantly below the RDA of 55 g (t = -9.81, p ≤ 0.05). This suggests that participants' diets were deficient in protein rich foods such as pulses, legumes, dairy products and meat, which are crucial for growth, tissue repair and metabolic functions. This deficit intake may be due to dietary preferences, economic constraints, or lack of awareness[2]. Inadequate protein intake among adolescent and young adult females has been associated with reduced lean body mass, poor immunity, delayed wound healing and compromised reproductive health[6].

Interestingly, fat intake was significantly higher than the RDA, with participants consuming 30.92 ± 134.6 g compared to the recommendation of 20 g (t = 4.103, p ≤ 0.05). This highlights an increasing reliance on high-fat foods, likely from fried snacks and processed foods. Such excess fat consumption, when combined with inadequate intake of protective nutrients, increases the risk of obesity and metabolic disorders in later life. This trend reflects a shift towards westernized dietary habits, with increased consumption of fried foods, bakery items, packaged snacks and fast foods that are high in saturated fats and trans-fats[7]. While fat is essential for energy and absorption of fat-soluble vitamins, excessive intake particularly of unhealthy fats may increase the risk of overweight, obesity and metabolic syndrome in later years[8]. The coexistence of inadequate energy and protein intake with excessive fat consumption highlights the imbalanced dietary pattern prevalent among young women.

With respect to micronutrients, the study observed alarming deficiencies. Iron intake was only 9.9 ± 6.09 mg, significantly below the RDA of 15 mg (t = -9.00, p ≤ 0.05), suggesting a high likelihood of iron-deficiency anemia; a widespread problem among adolescent girls in India, affecting more than 50 per cent of this population[1]. Anemia

reduces oxygen-carrying capacity, leading to fatigue, poor academic performance, lowered immunity and reduced productivity. Long-term consequences include increased risks during pregnancy and childbirth. The low intake observed in this study likely reflects insufficient consumption of iron-rich foods such as green leafy vegetables, legumes, fortified cereals and animal-based foods.

Calcium intake was even significantly inadequate, at 243.3 ± 130 mg compared to the RDA of 800 mg (t = -21.20, p ≤ 0.05). This severe deficit raises concerns about impaired bone mineralization and long-term risk of osteoporosis. This deficiency compromises the attainment of peak bone mass during late adolescence and early adulthood, thereby predisposing women to osteopenia and osteoporosis in later life [9]. Low calcium intake may be linked to insufficient consumption of milk, curd and other dairy products, which are often replaced by sugar-sweetened beverages and processed snacks in college students' diets [10].

Both vitamin A (463 ± 4.65 µg vs. 840 µg RDA; t = -15.39) and vitamin C (12.85 ± 16.25 mg vs. 55 mg RDA; t = -44.78) were significantly lower than the RDA, indicating poor intake of fruits and vegetables. Vitamin A deficiency compromises vision, immunity and epithelial health, while inadequate Vitamin C intake reduces antioxidant protection and limits non-heme iron absorption, thereby exacerbating iron deficiency anemia [11] These deficiencies likely reflect low intake of fresh fruits, vegetables, and colorful plant-based foods.

Finally, dietary fiber intake was also insufficient, with participants consuming only 9.6 ± 16.64 g compared to the RDA of 25 g (t = -16.45, p ≤ 0.05). Low fiber intake reflects poor consumption of whole grains, fruits and legumes, it may contribute to digestive problems and increased risk of non-communicable diseases. Fiber plays a crucial role in maintaining gastrointestinal health, regulating blood sugar, lowering cholesterol and reducing the risk of obesity and cardiovascular diseases[12]. The observed deficiency suggests inadequate consumption of whole grains, legumes, fruits and vegetables consistent with trends reported in other studies of Indian youth[4].

Table 2: Nutrient Intake of College-going Girls Compared with RDA(n=20)

Nutrients	Mean Actual Intake	RDA	t- value*
Energy (Kcals)	1059.35± .996	1660	-8.42
Protein(g)	30.03±123.0	55	-9.81

Fat (g)	30.92±134.6	20	4.103
Iron (mg)	9.9±6.09	15	-9.00
Calcium (mg)	243.3±130	800	-21.20
Vitamin A(ug)	463±4.65	840	-15.39
Vitamin C(mg)	12.85±16.25	55	-44.78
Fiber (g)	9.6±16.64	25	-16.45

* p value ≤ 0.05

Figure 1: Nutrient Intake of College-going Girls Compared with RDA(n=20)
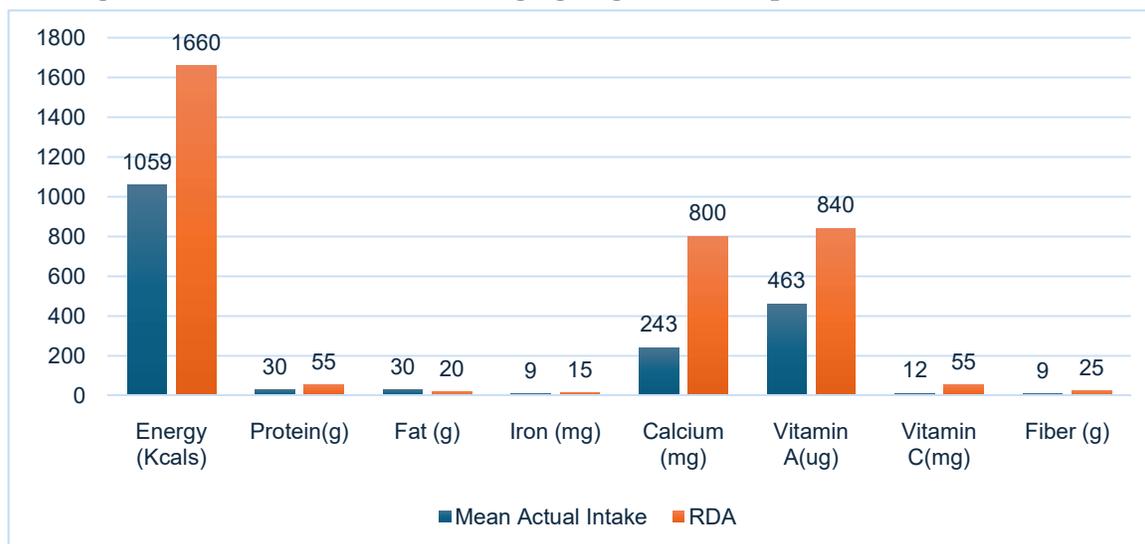
In summary, the analysis reveals a double burden of malnutrition among the participants: on one hand, inadequate intake of energy, protein and almost all essential micronutrients and on the other, excessive fat consumption. This imbalance highlights the urgent need for nutrition education, dietary modifications and campus-level interventions to ensure that young women meet their nutritional requirements for optimal health and performance.

CONCLUSION

The present study highlights significant nutritional inadequacies among college-going girls in Kurukshetra, with intakes of energy, protein, iron, calcium, vitamins A and C, and dietary fiber falling well below the Recommended Dietary Allowances (RDA) prescribed

by ICMR-NIN (2020). In contrast, fat intake was found to be substantially higher than recommended levels, indicating a dietary imbalance characterized by nutrient deficiencies alongside excessive consumption of unhealthy fats.

These findings reflect a double burden of malnutrition, where young women are simultaneously at risk of under nutrition and diet-related non-communicable diseases. Such dietary patterns, if uncorrected, may adversely affect growth, academic performance, reproductive health, immunity and long-term outcomes such as osteoporosis, anemia and metabolic disorders.

Given the pivotal role of adolescence and early adulthood in shaping future health, there is an urgent need for targeted nutrition education, behavior-change interventions and policy support within higher education institutions. Strategies such as promoting balanced diets through awareness programs, ensuring availability of nutrient dense foods in college canteens and encouraging healthy lifestyle practices can play a critical role in bridging the observed nutritional gaps.

In conclusion, despite of the fact that the sample size of the study is too small; a larger sample size is needed to draw any firm conclusions, this study underscores that improving the dietary practices of college-going girls is essential not only for their immediate well-being but also for safeguarding the health of future generations.

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