Original Research Article

Assessment of nutritional status and stress among adolescent girls

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Abstract

Background: The three most serious and common effects of stress are adrenal fatigue, neurotransmitter imbalances and hormonal and immunological disorders. The present study was conducted to assess nutritional status and stress among adolescent girls. **Materials & Methods:** 90 adolescent girls aged 12-18 years was recorded. The daily nutrient intake was calculated in terms of energy, protein, fat, ascorbic acid, iron, retinol, folic acid, and calcium. **Results:** The mean energy (Kcal) was 1406.4, 1540.2, 1724.3, 1892.2, 1911.2 and 1956.4, protein (g) was 19.2, 25.2, 27.0, 30.2, 31.2 and 30.6, fat (g) was 30.4, 31.6, 31.5, 31.6, 32.0 and 18.6, calcium (mg) was 435.4, 502.4, 560.5, 618.9, 620.4 and 468.2, iron (mg) was 15.4, 17.6, 19.4, 20.4, 20.5 and 17.2, retinol (µg) was 310.2, 310.5, 472.4, 501.4, 512.5 and 494.2, vit C was 19.4, 19.0, 21.9, 22.5, 23.3 and 23.4 and dietary folate (µg) was 98.2, 98.8, 119.4, 132.0, 134.2 and 126.5 in 12 years, 13 years, 14 years, 15 years, 16 years and 17 years respectively. The reasons for stress among adolescent was unhealthy dietary habits was seen in10%, inadequate sleep in 14%, academic work load was 22% and inadequate exercise in 7%. The difference was significant (P< 0.05). **Conclusion:** There was low nutritional status among adolescent girls. Reasons for stress among adolescent was unhealthy dietary habitsinadequate sleep, academic work load and inadequate exercise.

Key words: Nutritional status, adolescent, stress

Introduction

Adolescence is the stage of life in which a child transitions into an adult. It is characterized by accelerated growth, sexual maturation, and an increase in the complexity of psycho-social interactions[1]. During adolescence physical, psychological and social foundations are laid and consolidated. More than half of the world's adolescent population live in Asia. India has the largest population of adolescents. In many developing countries more than 50% of the adolescents fail to achieve their growth potential due to inadequate nutrition and faulty dietary habits[2]. Seeds of many psychological disturbances in adulthood are sown in adolescence. Adolescent children face many obstacles for healthy living. Most of the healthcare services in India are designed either for adults or children. Adolescent girls form a crucial segment of the population and as prospective mothers they form a vital bridge between the present and next generation. In India the prevalence of malnutrition among the girls remains very high[3].

The three most serious and common effects of stress are adrenal fatigue, neurotransmitter imbalances and hormonal and immunological disorders. Each of these conditions leads to another long list of debilitating symptoms which ultimately hampered the cognitive abilities of adolescents. appropriate activation of physiological stress responses are necessary for survival, repeated exaggerated or prolonged physiological reactivity to stressors may result in persistent dysregulation of stress system leading to a variety of physical and psychiatric disorders[4]. Numerous studies have been done on stress response by HPA/ANS systems and results demonstrate that a reciprocal interaction between the two systems and the activity of hypothalamic pituitary gonadal (HPG) axis, highlighting the possibility of pubertal influence on stress response system[5]. Stress causes various diseases, including infertility and ovarian dysfunction in female. Chronic stress can have a deleterious effect on the reproductive axis of females, as manifested in reduced pulsatile gonadotropin secretion and increased incidence of ovulatory abnormalities and infertility[6]. The present study was conducted to assess nutritional status and stress among adolescent girls.

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Materials & Methods

The present study was conducted among 90 adolescent girls aged 12-18 years. The consent from all parents of all subjects was obtained.

Data such as name, age, gender etc. was recorded. A thorough clinical examination was conducted among all. Food consumption of the subjects was assessed using a 24-hour recall method. The daily nutrient intake was calculated in terms of energy, protein, fat, ascorbic acid, iron, retinol, folic acid, and calcium. Nutritional status of all the adolescents was assessed by measuring body heights (cm), and weights (kg). Body weight, BMI, BMR and body fat content were measured by Bioimpedance analyser. Subjects are asked about the menstrual history. Stress status was measured by pretested questionnaires. Results of the study was compared and assessed statistically. P value less than 0.05 was considered significant.

Results

Table 1: Average daily nutrient intake of adolescent girl

Nutrients	12	13	14	15	16	17	P value
Energy(Kcal)	1406.4	1540.2	1724.3	1892.2	1911.2	1956.4	0.05
Protein(g)	19.2	25.2	27.0	30.2	31.2	30.6	0.04
Fat(g)	30.4	31.6	31.5	31.6	32.0	18.6	0.02
Calcium(mg)	435.4	502.4	560.5	618.9	620.4	468.2	0.01
Iron(mg)	15.4	17.6	19.4	20.4	20.5	17.2	0.04
Retinol(µg)	310.2	310.5	472.4	501.4	512.5	494.2	0.03
Vit C	19.4	19.0	21.9	22.5	23.3	23.4	0.02
Dietary Folate(µg)	98.2	98.8	119.4	132.0	134.2	126.5	0.05

Table I, graph I shows that mean energy (Kcal) was 1406.4, 1540.2, 1724.3, 1892.2, 1911.2 and 1956.4, protein (g) was 19.2, 25.2, 27.0, 30.2, 31.2 and 30.6, fat (g) was 30.4, 31.6, 31.5, 31.6, 32.0 and 18.6, calcium (mg) was 435.4, 502.4, 560.5, 618.9, 620.4 and 468.2, iron (mg) was 15.4, 17.6, 19.4, 20.4, 20.5 and 17.2, retinol (µg) was 310.2, 310.5, 472.4, 501.4, 512.5 and 494.2, vit C was 19.4, 19.0, 21.9, 22.5, 23.3 and 23.4 and dietary folate (µg) was 98.2, 98.8, 119.4, 132.0, 134.2 and 126.5in 12 years, 13 years, 14 years, 15 years, 16 years and 17 years respectively. The difference was significant (P< 0.05).

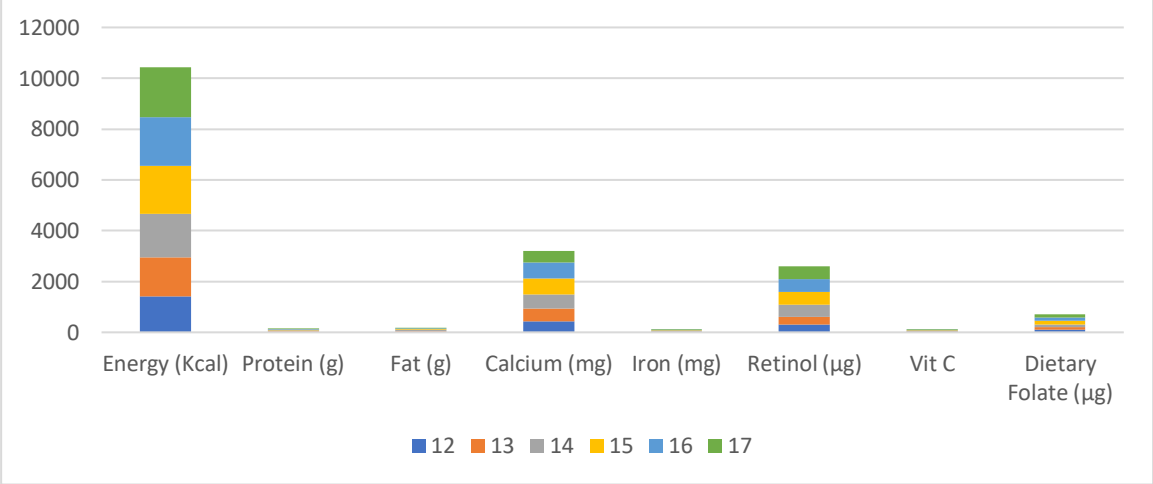

Fig 1: Average daily nutrient intake of adolescent girl

Table 2: Reasons of stress among adolescent

Reasons	Percentage	P value
unhealthy dietary habits	10%	0.05
inadequate sleep	14%	
academic work load	22%	
inadequate exercise	7%	

Table 2,Fig 2 shows that reasons for stress among adolescent was unhealthy dietary habits was seen in10%, inadequate sleep in 14%, academic work load was 22% and inadequate exercise in 7%. The difference was significant (P< 0.05).

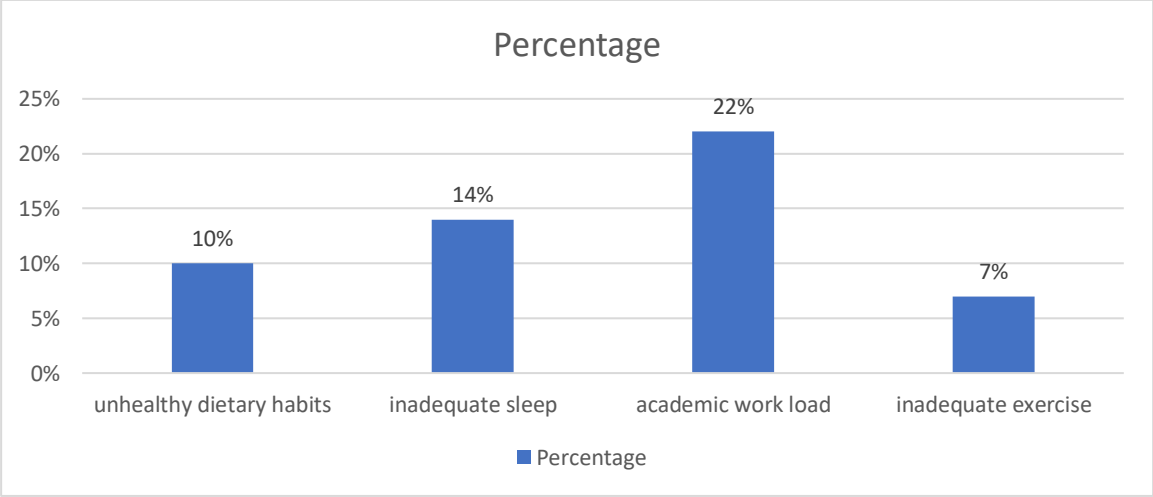

Fig 2: Reasons of stress among adolescent

Discussion

Adolescents comprise one quarter of the world's population. This time of life is critically important because it is during this period that rapid growth and development occurs, and thus, adolescents require higher nutrient intakes[7,8]. Furthermore, health and food behaviors are shaped during this period, and thus, adolescents are more vulnerable to health and nutrition concerns than other age groups[9]. More importantly, adolescent girls need good quality nutritive foods in sufficient quantity to cope with the added nutritional requirements associated with onset of maturity, menstruation, participation in various physical activities, and to reduce health risks and break the intergenerational cycle of malnutrition[10]. The present study was conducted to assess nutritional status and stress among adolescent girls.In present study, we found that mean energy (Kcal) was 1406.4, 1540.2, 1724.3, 1892.2, 1911.2 and 1956.4, protein (g) was 19.2, 25.2, 27.0, 30.2, 31.2 and 30.6, fat (g) was 30.4, 31.6, 31.5, 31.6, 32.0 and 18.6, calcium (mg) was 435.4, 502.4, 560.5, 618.9, 620.4 and 468.2, iron (mg) was 15.4, 17.6, 19.4, 20.4, 20.5 and 17.2, retinol (µg) was 310.2, 310.5, 472.4, 501.4, 512.5 and 494.2, vit C was 19.4, 19.0, 21.9, 22.5, 23.3 and 23.4 and dietary folate (µg) was 98.2, 98.8, 119.4, 132.0, 134.2 and 126.5 in 12 years, 13 years, 14 years, 15 years, 16 years and 17 years respectively. Basu et al[11] found that the reciprocal interaction between stress and reproductive axis was manifested by ovulatory abnormalities and infertility in female adolescent girls. 50 adolescent girls (12-19 years) were surveyed using pre-tested questionnaires about nutritional status, general heath, menstrual cycle and source of stress. Height, weight, BMI, BMR and body fat content (by Bioimpedance analyser), blood pressure, heart rate and O2 saturation was measured. The adolescent girls were stunned which indicates chronic malnutrition and lack of physical growth. Majority of them had a lower BMI (younger) and higher dysmenorrhea (older). Academic workload was found to be the most stressful event followed by, exercising, inadequate sleep, unhealthy dietary habits, and socio-economical status.We found that reasons for stress among adolescent was unhealthy dietary habits was seen in10%, inadequate sleep in 14%, academic work load was 22% and inadequate exercise in 7%. Hadush et al[12] conducted a cross-sectional study among 736 adolescent girls. Body Mass Index for age (thinness) and height for age (stunting) was used to assess undernutrition of adolescent girls by using the new 2007 WHO Growth Reference. The study revealed that the prevalence of thinness and stunting were 15.8% (95% CI 13.3–18.5%) and 26.6% (95% CI 23.5–29.9%), respectively. Being at an early adolescent age (AOR = 2.89, 95% CI 1.23–6.81) for thinness and being at an early adolescent age (AOR = 1.96, 95% CI 1.02–3.74), household food insecure (AOR = 2.88, 95% CI 1.15–7.21), menstruation status (AOR = 2.42, 95% CI 1.03–5.71), and availability of home latrine (AOR = 3.26, 95% CI 1.15–4.42) for stunting were the independent predictors among the adolescent girls.Singh et al[13] in their study a total of 418 teenage adolescent girls were selected. 49.76% (208/418) were underweight. Results revealed that sociodemographic factors such as teenage adolescent girls who were from low ethnicity (adjusted odds ratio (AOR)=2.02, 95%CI: 1.00–4.23), subjects whose father's education level was primary or lower (AOR=1.87, 95%CI: 1.12–3.11), and number of people in the family >4 (AOR=2.18, 95%CI: 1.18–4.03) were associated with being underweight. Likewise, dietary behavior-related factors such as vegetarian (AOR=2.21, 95%CI: 1.25–3.92), and <3 meals per day (AOR=2.36, 95%CI: 1.40–3.98) than their counterparts were associated with being underweight. In addition, teenage adolescent girls from food-insecure households (AOR=3.33, 95%CI: 2.01–5.51) were more likely to be underweight than those from food-secure households.

Conflict of Interest: Nil Source of support: Nil

Conclusion

Authors found that there was low nutritional status among adolescent girls. Reasons for stress among adolescent was unhealthy dietary habitsinadequate sleep, academic work load and inadequate exercise.

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