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Eating habits and night snacking patterns of young women at risk for eating disorders

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Abstract

Introduction: Nowadays, eating disorders are an emerging concern in India. Previous studies showed that early detection and intervention of eating disorders is positively related with a good prognosis. Eating disorders in India seems to be rising tremendously, despite this; there are very few published studies on eating pathology and prevalence of women with eating disorders in India. Eating disorders (EDs) are those disorders that comprise of irregular or undesirable eating practices. They are distinguished either by excessive intake or inadequate intake of food, followed by laxative abuse, self-induced vomiting, starvation, over exercising and so on which further lead to full blown eating disorders. With the increasing trend of social networking, poor eating habits and night snacking are a common practice seen in young adults that can further lead to low diet quality and development of serious health problems. Thus, appropriate techniques should be taken into consideration while giving nutrition education or intervention programs targeting young adults.

Objective: To study the eating habits, night snacking patterns and nutrient intake of young women at risk of developing eating disorders.

Methods: A cross-sectional study was conducted in 93 young women (42 at risk) with mean age of 21.5±1.7 years. Structured questionnaire was used to analyze the eating habits and snacking pattern. Nutrient intake was assessed using 3-day diet recall. Analyses were performed using SPSS software for Windows (version 25, 2017, IBM Corporation, Armonk, New York, and United State). Data are presented as Mean ± SD, median (minimum-maximum) or percentage. $P<0.05$ was considered to be statistically significant.

Results: Significantly higher percentage of women 'at risk' skipped meals to consume snacks as compared to women who were 'not at risk' ($p<0.05$). There was a significant association of frequency consumption of desserts and risk of eating disorder with higher percentage of women 'at risk' consuming desserts daily ($p<0.05$). There was a significant association of satisfaction of current eating habits and risk of eating disorder with higher percentage of women 'at risk' (54.8%) not satisfied as compared to women 'not at risk' (27.5%) (p=0.024). There was a significant association of special diet followed and risk of developing eating disorders (p=0.009). Women 'at risk' had significantly higher score for eating energy dense foods after suppertime and this need to eat was to help them to get sleep after waking up at night ($p<0.05$) and also they had significantly lower score for having control over eating while up at night and later feel upset due to night eating ($p<0.05$). Women 'at risk' had significantly lesser energy, fat and percentage RDA intake of energy ($p<0.05$).

Conclusion: Habits and night snacking patterns are highly compromised in young women at risk for developing eating disorders. Abnormal eating habits can lead to development of serious health problems such as anorexia nervosa and bulimia nervosa, while night eating habits is directly associated with weight issues. Also 'at risk' women were assumed to have a poor self-image which may lead to psychological problems in future. Thus, effective counselling techniques need to be used to prevent development of eating disorders in these women.

Keywords: Eating disorders, eating habits, night snacking, young adults, nutritional status

Introduction

Eating disorders (EDs) are those disorders that comprise of irregular or undesirable eating practices. They are distinguished either by excessive or inadequate intake of food, followed by laxative abuse, self-induced vomiting, starvation, over exercising and so on which further lead to full blown eating disorder [1]. Over estimation of slimness is considered to be an important factor in the pathology of eating disorders which is commonly seen in western females. It has been assumed that these disorders are slowly spreading to non-western nations due to cultural transformations [2].

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Research demonstrates that young adults tend to involve in poor eating behaviors, such as low fruit and vegetable consumption, high consumption of energy-dense snack foods and frequently fail to consume regular meals. Skipping meals is the elimination or lack of consumption of one or more of the important meals such as breakfast, lunch or dinner throughout the day [3]. The regular omission of meals, particularly the breakfast meal, has been associated with poorer diet quality, lower intakes of total energy, vitamins and minerals, increased risk of central adiposity, poor insulin resistance and cardio metabolic risk factors [4, 5].

Abnormal eating patterns and unspecified eating behavior could possibly lead to various health problems such as bulimia nervosa and anorexia nervosa. These disorders are found to be more prevalent in the developed western countries [6]. Many research studies have shown that anorexia nervosa (AN) and bulimia nervosa (BN) are more common among females than males [7].

Considering Indian scenario, a study conducted on 210 medical students of Chennai using Eating attitude test (EAT) and Bulimia Investigatory Test, Edinburgh (BITE) self-report questionnaires showed that 14.8% of the students had syndromes of eating distress [8]. Likewise, another study carried out on a north Indian population reported prevalence of Bulimia Nervosa to be 0.4% [9].

Diet is considered as a vital modifiable factor in influencing weight status. Night eating is characterized as evening hyperplasia where the food intake is at least 25% of total calories at night i.e. eating late at night, a light meal as a substitution of meal or food intake. Particularly, food consumption at night has been significantly associated with lower diet quality in children, adolescents and adults, also body mass index (BMI) and more chances of being obese [10]. A metabolic abnormality has been highly correlated with the combination of timing of food intake and the nutrient profiles [11], for example, skipping breakfast has been highly related to obesity [12] and previous studies reported that there is a link of night eating with increased weight gain during the transition from adolescence to adulthood [13].

Also frequently eating during night can lead to high calorie consumption, resulting into nutritional imbalances and increased intake of sodium, obesity and gastrointestinal disorders [14]. In a study, it was reported that the food consumption was higher in the subjects who had night eating snacks compared to subjects who did not. Also the night eating subjects gained up to 5.2kg of weight compared to (0.9 kg weight gain) in non-night eating subjects 6 years later [15].However, mostly night eating snacks is loaded with high concentration of fats and carbohydrates resulting in increased calorie and fat intakes [16]. Such disordered eating behavior when continued for a long time may lead to development of serious syndrome such as night eating syndrome (NES) [17].

Materials and methods
A cross sectional study was carried out to identify young adult healthy women at risk for eating disorders in Mumbai and to assess their nutritional status. The participants were selected by random sampling method from SNDT Women's University, Juhu. A sample population of 400 young adult healthy women aged 18 to 25 years were included in the study. The women suffering from any health disorder, pregnant, lactating women and athletes were excluded from the study.

The study was conducted in two phases
Phase 1- Questionnaire (EAT-26) was administered to the participants and the eating disorder scores were calculated manually and the participants were classified into risk of eating disorders. Also each participant's height was measured using a measuring tape and weight using a weighing scale. The participants were divided into 2 groups. a) One who had risk of eating dis orders b) One who doesn't have risk of eating dis orders.

Phase 2- Out of 400 participants, 42 were found to be 'at risk' of eating disorders. From the rest of the participants who were 'not at risk', 51 participants were randomly selected. The selected participants were administered with another questionnaire comprising of medical history, lifestyle pattern, eating habits-during the day and during the night (from 12 am to 4 am), food frequency questionnaire and three days dietary record to assess their nutritional status and other parameters.

Screening Instrument: Eating attitude test (EAT-26):- This is the screening instrument used to identify eating disorders among young adult healthy women. The English version of the instrument will be used. The EAT-26 developed by Garner *et al.* identifies the presence of symptoms that are consistent with either a possible eating disorder or disordered eating and warrant a complete evaluation. EAT consist of 26 items multidimensional self-report scale designed to assess the attitudes, behavior related to eating and eating disorder symptoms. Item 1-25 are scored as follows: Always=3, usually= 2, often=1; other answers=0. Item 26 is scored in the opposite direction. (Never= 3 etc.).

Statistical methods
Analyses were performed using SPSS software for Windows (version 25, 2017, IBM Corporation, Armonk, New York and United State). Data are presented as Mean ± SD, median (minimum-maximum) or percentage. Independent Sample T test was used to analyze the difference in anthropometry and nutrient intake when classified according to risk. Mann Whitney U Test was used to analyze the difference in hedonic rating of night snacking pattern between women at risk and women not at risk. The frequency distributions were tabulated for various parameters according to risk and were compared using cross tabulations and chi-square test. $p<0.05$ was considered to be statistically significant.

Results and discussions
Eating habits and night snacking patterns of 93 young women (42 'at risk' for eating disorder, 51 'not at risk' for eating disorder) with mean age 21.5±1.7 years is presented in the current study.

Anthropometric parameters
The mean height of the women in the study was 159±5.7 cm, weight was 58.5±12 kg and BMI was 23.1±4.5 kg/m^2. Table 1 gives anthropometric parameters when classified according to risk of developing eating disorders. There was no significant difference in the height, weight or BMI of women when classified according to risk of developing eating disorder (p>0.05) (Table 1). Of the 93 women, 12 (12.9%) were underweight (BMI <18.5kg/m^2), 37 (39.8%) were normal weight (BMI = 18.5-23kg/m^2), 26 (28%) were overweight (BMI = 23-27kg/m^2) and 18 (19.4%) were obese (BMI >27 kg/m^2). Lower percentage of women 'at risk' had normal weight as compared to 'not at risk' group, however, there was no significant association of BMI categories and being 'at risk' for eating disorders (p>0.05) (Table 1).

Table 1: Anthropometric parameters of women when classified according to risk of developing eating disorder

	At risk (n=42)	Not at risk (n=51)	P value
Height (cm)	158.5±6.2	159.5±5.3	0.413
Weight (kg)	59.2±13.3	58±10.8	0.624
BMI (kg/m^2)	23.6±5	22.8±4.1	0.400
BMI categories			χ2 (p value)
Underweight (%)	16.7	9.8	
Normal (%)	31	47.1	3.138 (0.371)
Overweight (%)	33.3	23.5	
Obese (%)	19	19.6	

Data presented as Mean± SD and percentage

Snacking pattern

Table 2 gives snacking pattern details of women in study. About 36% of women skipped meals and compensated it by consuming snacks. Significantly higher percentage of women 'at risk' skipped meals to consume snacks as compared to women who were 'not at risk' ($p<0.05$) (Table 2). There was no significant difference in the percentage of women who liked salty, sweet or fast food snacks when classified according to risk of developing eating disorders (p>0.05) (Table 2). There was no significant association of percentage of women checking nutrition label on snacks and risk of developing eating disorders indicating that similar percentage of women checked nutrition label of snacks irrespective of risk of developing eating disorders (p>0.05) (Table 2).

Harvey K et al. 2010 reported that evening snacks are the most commonly consumed snacks of the day which is positively associated with binge eating [18].

Also Cachelin F et al. 2016 reported that more frequent snacking was associated with lower BMI and with less weight importance. In bulimia nervosa, frequent evening snacks were positively associated with less dietary restriction and more weight and shape concern [19].

Table 2: Snacking pattern of the women in the study

	At risk (n=42)	Not at risk (n=51)	Total (n=93)	χ2 value	P value
Skip meals to have snacks	25 (59.5%)	9 (17.6%)	34 (36.3%)	17.415	0.001*
Sweet snacks	13 (31%)	11 (21.6%)	24 (25.8%)	1.059	0.303
Salty snacks	20 (47.6%)	26 (51%)	46 (49.5%)	0.104	0.747
Fast food snacks	18 (42.9%)	13 (25.5%)	31 (33.3%)	3.126	0.077
Check nutrition label of snack					
No	9 (21.4%)	5 (9.8%)	14 (15.1%)		
Yes	15 (35.7%)	20 (39.2%)	35 (37.6%)	3.906	0.272
Sometimes	18 (42.9%)	26 (51%)	44 (47.3%)		

Data presented as frequency (%) $p< 0.05$ considered to be statistically significant

Frequency consumption of selected food groups

Highest percentage of women (68.8%) consumed 4-6 servings of fruits every day, 57% consumed desserts sometimes and 50.5% consumed fried foods once/ week (Table 3). There was a significant association of frequency consumption of desserts and risk for developing eating disorders with higher percentage of women 'at risk' for developing eating disorders consuming desserts daily as compared to women who were 'not at risk' ($p<0.05$) (Table 3). Higher percentage of women 'not at risk' for developing eating disorder consumed 7 or more servings of fruits and vegetables everyday however this association was not significant (p>0.05) (Table 3). Similarly, there was no significant association of frequency consumption of fried foods and risk of developing eating disorders (p>0.05) (Table 3).

Food cravings are an intense desire to consume a certain food or food type that is hard to resist. However frequent food cravings may lead to an unwanted consumption of craved foods and later trigger the feelings of guilt and shame. Thus, food cravings may be associated with disordered eating and eating disorder psychopathology. Chao A et al. 2015 reported that females had significantly higher cravings for sweets than males and increased food cravings were positively associated with binge eating and global eating disorder psychopathology [20].

Table 3: Frequency consumption of selected food groups

	At risk (n=42)	Not at risk (n=51)	Total (n=93)	χ2 value	P value
Fruits and vegetable servings consumed everyday					
Zero	1 (2.4%)	2 (3.9%)	3 (3.2%)		
1-3	7 (16.7%)	5 (9.8%)	12 (12.9%)	4.472	0.215
4-6	31 (73.8%)	33 (64.7%)	64 (68.8%)		
7 or more	3 (7.1%)	11 (21.6%)	14 (15.1%)		
Frequency of dessert consumption					
Never	1 (2.4%)	1 (2%)	2 (2.2%)		
Occasionally	12(28.6%)	17 (33.3%)	29 (31.2%)	7.792	0.050*
Sometimes	21 (50%)	32 (62.7%)	53 (57%)		
Always	8 (19%)	1 (2%)	9 (9.7%)		
Frequency consumption of fried foods					
Never	3 (7.1%)	2 (3.9%)	5 (5.4%)		
Once/ week	17 (40.5%)	30 (58.8%)	47 (50.5%)	4.326	0.364
1-3 times/ week	19 (45.2%)	18 (35.3%)	37 (39.8%)		

| 4 – 6 times/ week | 2 (4.8%) | 1 (2%) | 3 (3.2%) | | |
| Daily | 1 (2.4%) | 0 (0%) | 1 (1.1%) | | |

Data presented as frequency (%) *$p < 0.05$ considered to be statistically significant

Satisfaction of eating habits

Of the 93 women, 37 (39.8%) were not satisfied with current eating habits, 48 (51.6%) were satisfied with current habits and 8 (8.6%) were very satisfied with current eating habits. There was a significant association of satisfaction of current eating habits and risk of developing eating disorder with higher percentage of women 'at risk' [23 (54.8%)] of developing eating disorder not satisfied with current eating habits as compared to women 'not at risk' [14 (27.5%)] of developing eating disorder ($\chi2=7.472$, p=0.024). 17 (40.5%) and 2 (4.8%) of the women 'at risk' were satisfied and very satisfied respectively with their current eating habits. 31 (60.8%) and 6 (11.8%) of the women not at risk were satisfied and very satisfied respectively with their current eating habits.

Follow special diet

Out of the 93 women, 9 (9.8%) were currently on special diet, 29 (31.5%) reported to be on special diet in the past whereas 54 (58.7%) were not on any diet. There was a significant association of special diet followed and risk of developing eating disorders. Higher percentage of women 'at risk' of developing eating disorder were currently on special diet [5 (12.2%)] or were on special diet in past [19 (46.3%)] as compared to women 'not at risk' [current diet 10 (19.6%), past diet 4 (7.8%)] ($\chi2=9.335$, p=0.009).

Roehrig M *et al*. 2009 reported that frequently dieting is associated with greater eating disorder pathology [21].

Reasons for over-eating

The main reason for over-eating was hunger and stress in women (Table 3). Significantly higher percentage of women 'at risk' for developing eating disorder over-ate when tired as compared to women 'not at risk' for developing eating disorder ($p<0.05$) (Table 3). There was no significant difference in the women reporting other reasons for over-eating between the two groups (p>0.05) (Table 3).

Table 3: Reasons for over-eating

	At risk (n=42)	Not at risk (n=51)	Total (n=93)	χ2 value	P value
Hungry	20 (47.6%)	21 (41.2%)	41 (44.1%)	0.388	0.533
Stress	16 (38.1%)	22 (43.1%)	38 (40.9%)	0.242	0.623
Tired	6 (14.3%)	1 (2%)	7 (7.5%)	5.027	0.025*
Bored	3 (7.1%)	5 (9.8%)	8 (8.6%)	0.207	0.649
Sad	3 (7.1%)	5 (9.8%)	8 (8.6%)	0.207	0.649
Have Cravings	3 (31%)	13 (25.5%)	26 (28%)	0.341	0.559
As a reward	3 (7.1%)	2 (3.9%)	5 (5.4%)	0.470	0.493

Data presented as frequency (%) *$p < 0.05$ considered to be statistically significant

Night eating habits

Night eating habits were assessed using a 5-point hedonic scale ranging from 0 to 4 with 0 standing for "not at all" and 4 standing for "extremely so". As seen in Table 4, women 'at risk' had higher hedonic rating score for eating energy dense foods after suppertime and this need to eat was to help them to get sleep after waking up at night as compared to women 'not at risk' ($p<0.05$). On the other hand, women 'at risk' had significantly lower score for having control on over eating while up at night and feel upset due to night eating as compared to women 'not at risk' ($p<0.05$) (Table 4).

Nowadays, with the increasing trend of social networking, snacking has become the most important aspect of our daily routine. One of the most common trends is to skip the main meals such breakfast, lunch and dinner; whilst major amount of calories are consumed from the snacks eaten after dinner. Such disordered eating behaviour when continued for a long time may lead to development of serious syndrome such as night eating syndrome. In 2010, the study conducted by S Suri and R Pradhan reported that almost half the percentage of adolescents used to snack during the night [17].

Table 4: Hedonic rating score for night eating habits of women

	At risk (n=42)	Not at risk (n=51)	Total (n=93)	Z value	P value
Have cravings or urges to eat snacks after supper, but before bedtime?	1 (0-4) (1.17)	1 (0-3) (0.88)	1 (0-4) (1.01)	-0.576	0.565
Have control do you have over your eating between supper and bedtime?	2.5 (0-4) (2.31)	3 (0-4) (2.25)	3 (0-4) (2.28)	-0.012	0.990
Have more of daily food intake after suppertime?	1 (0-3) (1.57)	1 (0-2) (0.84)	1 (0-3) (1.17)	-3.559	0.001*
Have cravings or urges to eat snacks when you wake up at night?	0.5 (0-4) (1.07)	0 (0-3) (0.55)	0 (0-4) (0.78)	-1.868	0.062
Do you need to eat in order to get back to sleep when you awake at night?	0 (0-3) (0.57)	0 (0-2) (0.10)	0 (0-3) (0.31)	-2.981	0.003*
When you get up in the middle of the night, how often do you snack?	0 (0-3) (0.62)	0 (0-3) (0.33)	0 (0-3) (0.46)	-1.673	0.094
How much control do you have over your eating while you are up at night?	2 (0-4) (1.88)	3 (0-4) (2.65)	3 (0-4) (2.30)	-2.513	0.012*
Is your night eating upsetting to you?	0 (0-4) (0.93)	0 (0-4) (0.39)	0 (0-4) (0.63)	-2.478	0.013*

Data presented as Median (minimum-maximum) (Mean) *$p < 0.05$ considered to be statistically significant

Nutrient intake

The mean energy intake of the participants was 1484±361 kcal/d, protein intake was 37.7±11.1 g/d, carbohydrates intake was 201.1±53.5 g/day and fat intake was 44.7±14.8 g/day. Mean percentage energy from carbohydrates was 54.9±10.8%, percentage energy from proteins was 10.3±2.6% and percent energy from fats was 27.2±6.9%. Percentage RDA intake for energy was 78.1±19% and percentage RDA intake for proteins was 67.7±20.6%. Table 5 gives nutrient intake of women when classified according to risk of eating disorders. Women at risk for eating disorder had significantly lesser energy, fat and percentage RDA intake from energy as compared to women 'not at risk' ($p<0.05$) (Table 5).

According to Sandra G *et al.* (2002), on comparing healthy

women, women with anorexia nervosa were reported to consume significantly lower calories and fats during the first year of illness [22].

Also Chiurazzi C *et al*. 2017 reported that women with restrictive anorexia consumed significantly lower calories than the control group [23].

Table 5: Nutrient intake in women when classified according to risk of developing eating disorder

	At risk (n=42)	Not at risk (n=51)	P value
Energy (kcal/d)	1383±342	1567±358	0.014*
Carbohydrates (g/d)	191.9±47.5	208.7±57.4	0.133
Proteins (g/d)	35.8±12.4	39.2±9.9	0.142
Fats (g/d)	40.5±13.8	48.1±14.9	0.013*
Percentage energy from carbohydrates (%)	56.8±12.7	53.3±8.8	0.123
Percentage energy from proteins (%)	10.5±3.2	10.1±2.0	0.493
Percentage energy from fats (%)	26.6±7.8	27.7±6.1	0.457
Percentage RDA from energy (%)	72.8±18	82.4±18.8	0.014*
Percentage RDA from proteins (%)	65.1±22.5	69.9±19	0.262

Data presented as Mean ± SD *$p < 0.05$ considered to be statistically significant

Conclusion
Eating habits and night snacking patterns are highly compromised in young women 'at risk' for developing eating disorders. Abnormal eating habits can lead to development of serious health problems such as anorexia nervosa and bulimia nervosa, while night eating habits is directly associated with weight issues. Also 'at risk' women were assumed to have a poor self-image which may lead to psychological problems in future. Thus, effective counselling techniques need to be used to prevent development of eating disorders in these women.

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