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Breakfast consumption pattern and nutritional status of adolescent girls

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To assess the breakfast consumption pattern and nutritional status, a total of 500 adolescent girls in the age group of 16-18 years were selected randomly from rural and urban government schools of Ludhiana district. An interview schedule was used to assess their meal pattern, frequency of breakfast consumption and reasons behind their skipping of breakfast. Their height and weight was measured and BMI was also calculated. The results revealed that the prevalence of breakfast consumption on daily basis was higher among urban adolescent girls (51%) than rural (46%) and frequency decreased with increase in age. The major reasons behind skipping of breakfast were lack of appetite (37%), time (28%) and family meal pattern (17%). A higher percentage of rural adolescent girls were found to be underweight as compared to their urban counterparts but out of underweight category more of urban adolescent girls were found to be severely thin.

Key Words : Breakfast consumption pattern, Appetite, Adolescence, Meal pattern, Breakfast skipping, Underweight

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INTRODUCTION

Breakfast the widely acknowledged term, is considered to be the first and the most important meal of the day. It provided body and brain with fuel and it differs qualitatively from other eating occasions by virtue of being consumed after overnight fast, contributes substantially to the daily nutrient intake and energy needs (Adolphus *et al.,* 2013). Apart from providing energy, breakfast also provides micronutrients. A healthy breakfast should provide one-fourth of the total energy from daily intake (Basch, 2011). Breakfast consumption is important to overall dietary quality and nutritional adequacy in school aged children and adolescents. Skipping breakfast has become the norm in modern day society in India. Around 20-30 per cent of the children and adolescents usually skip breakfast in the developed world (Sandercock *et al.,* 2010). Teens tend to be more self-conscious about the way they look, thus tends choose to skip breakfast as one of the means to lose weight, specifically at this age (Garg *et al.,* 2014). Breakfast skipping leads to lower intakes of fat, carbohydrate and protein which result in their suboptimal growth and development. With age skipping of breakfast increased and there was higher proportion of breakfast skippers (59%) in age of 14 to 16 years and skipping was significantly more among girls than boys and it has been observed that children who habitually consume breakfast have healthier body weight and tend to engage in healthier lifestyle behaviour (Fayet-Moore *et al.,* 2016). Despite of the importance of healthy eating pattern, most of the time adolescent's lifestyle get influenced by social norms and individual own attitudes and beliefs which might not encourage them to have healthy dietary pattern with their changing nutritional needs

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(Bruening *et al.*, 2012).

In the developing countries, breakfast inadequacy is rarely compensated with subsequent meals particularly amongst poor and when persistent for longer period of time results in chronic under-nutrition among adolescent girls. The study reported that on an average 50 per cent of children were breakfast skippers, out of which majority of them (32%) were undernourished (Mishra, 2016). Whereas many studies also found that there is an inverse relationship between breakfast frequency and weight gain. The prevalence of regular breakfast skipping was 20 per cent among children and 31.5 per cent among adolescents. The adolescent who used to consume cereal in breakfast were having less BMI than those who were on non-cereal breakfast diet (Deshmukh-Taskar *et al.*, 2010). The problem does not end here, approximately 80 per cent of the obese adolescents become obese adults so there is a need to prevent and manage obesity during adolescence (Huang *et al.*, 2010). Our country is facing an imbalance in the development of rural and urban areas that is why there is a large difference in the living environment and eating habits of people living in rural and urban regions. Gender differences of eating breakfast in different regions, commonly among adolescents, especially girls can also be observed (Vereecken and Rasmussen, 2009). Therefore, keeping in mind all the above facts, the present study has been planned in order to investigate the breakfast consumption pattern and nutritional status of adolescent girls.

METHODOLOGY

A total sample of five hundred adolescent girls in the age group of 16-18 years was randomly selected with equal number (250 each) from following four schools located in rural and urban areas of district Ludhiana. The interview schedule was developed to obtain information regarding their age, socio-economic and demographic profile along with their meal pattern and frequency of breakfast consumption. The height and weight of all the five hundred subjects were measured using standard methods given by Jelliffe (1996). The body mass index (BMI) of the subjects was also calculated from recorded values of height and weight by using the following formula given by Garrow (1981) and further classified on the basis of International classification of BMI (WHO, 2004).

The data were analysed by computation of descriptive statistical measures. Z-test was used to evaluate the frequency of food consumed in breakfast by rural and urban adolescent girls. Level of significance was set at $p \leq 0.05$.

OBSERVATIONS AND ASSESSMENT

The data (Table 1) on general information of the total subjects showed that about half of the girls were in age group of 16-17 years and remaining half were in the age group between 17-18 years, with mean age of 17.2 ± 0.81 years. Majority of rural and urban subjects belonged to nuclear families (67.4%) as compared to joint family units (32.6%). On an average only 7 per cent of the urban in comparison with rural adolescent girls had

Table 1 General information of the adolescent girls **(n = 500)**

Profile	Rural (n=250)	Urban (n=250)	Total
Age (years)			
16-17	138 (55.2)	115 (46)	253 (50.6)
17-18	112 (44.8)	135 (54)	247 (49.4)
Mean ± SE	16.9 ± 0.82	17.5 ± 0.8	17.2 ± 0.81
Family type			
Nuclear	177 (70.8)	160 (64)	337 (67.4)
Joint	73 (29.2)	90 (36)	163 (32.6)
Family size			
Upto 4	53 (21.2)	107 (42.8)	160 (32)
5-8	167 (66.8)	125 (50)	292 (58.4)
>8	30 (12)	18 (7.2)	48 (9.6)
Food habits			
Vegetarian	171 (68.4)	159 (63.6)	330 (66)
Non- vegetarian	79 (31.6)	91 (36.4)	170 (34)

Figures in parenthesis indicate percentage

family size comprising more than 8 members. Chadda and Deb (2013) observed that the nutritional status of a person largely depends upon the size of a family. The larger the size of family, poorer will be the nutritional status of their members. The percentage of vegetarian adolescent girls was higher in rural (68.4%) as compared to urban (63.6%) area.

The data in Table 2 present the frequency of breakfast consumption by rural and urban adolescent girls which revealed that about half (48.8%) of the adolescent girls from both rural and urban area consumed breakfast on daily basis, out of which a higher percentage of urban adolescent girls used to consume breakfast on daily basis as compared to rural adolescent girls. around 11.8 per cent of subjects were used to consume breakfast three times in a week followed by 10 per cent two times a week and 13.6 per cent of them used to consume breakfast on weekly basis. Further, it was observed that 8.2 per cent of rural and urban subjects never consumed breakfast. The consumption of breakfast was found to vary with changing seasons among irregular consumers. This might be due to lack of appetite and time to consume or prepare meal due to early school timings during summer season. Likewise, Affeuito (2005) reported that the adolescent girls used to skip their meals because of lack of appetite, dieting, inconvenience of time.

The results of frequency consumption pattern of breakfast (Table 3) indicated that cereal products like rusk were consumed two times a week with mean frequency score of 2.22 ± 1.71 among rural and 2.43 ± 2.00 among urban adolescent girls. A comparatively higher percentage of urban (9%) subjects used to consume vegetable sandwich in breakfast (two times in a week) than rural (2%) subjects. The mean consumption frequency score of chapatti with vegetable was found to be higher among rural adolescent girls than urban (3.44 ± 2.08). Out of milk products average intake of milk in breakfast showed that about 7 per cent of rural and urban adolescent girls consumed milk on daily basis. Fortnightly consumption of lassi was found with mean consumption frequency score of 1.29 ± 1.45 by rural and 1.49 ± 1.92 by urban subjects. About half of the rural and urban adolescent girls used to consume tea on regular basis in breakfast. The mean consumption of shakes was found to be less among both rural and urban subjects with mean frequency consumption score of 0.59 ± 1.13 and 0.39 ± 0.88. The consumption frequency of whole fruits in breakfast was three times a week with comparatively higher consumption among rural (33%) than urban (11%) subjects. Rarely to fortnightly consumption of boiled eggs (0.18±0.59), omelette (0.16±0.43), egg roll (0.14± 0.42) and egg bhurji (0.13±0.34) was found with comparatively higher consumption among rural adolescent girls than urban. Similarly, Adole and Ware (2014) stated that about 16 per cent of the subjects used to consume egg based breakfast on fortnightly basis.

The data in Table 4 highlighted the factors that affect consumption of breakfast either occasionally or daily and showed that about one-third of the breakfast skippers used to skip their meal mainly because of lack of appetite or hunger (37.11%) and lack of time (28.12%). A comparatively higher percentage of rural (34.3%) than urban (21.3%) adolescent girls used to skip their breakfast in morning mainly because of lack of time before going to school. The factor varied with seasonal changes in school timings as in summers they used to skip more than winter season because of early school timings. About 17.57 per cent of them have the family meal pattern of skipping breakfast which affected their meal choices as well. Around 8.98 per cent of the adolescent girls used to skip breakfast because their parents were working followed by 7.03 per cent of them were on dieting and 1.19 per cent of them used to skip breakfast because of some stress. However, the parents had to go to their respective jobs early in the morning and because of nuclear family units there was nobody else who could prepare

Table 2 : Mean consumption frequency of breakfast by adolescent girls **(n = 500)**

Frequency of breakfast consumption	Rural (n=250)	Urban (n=250)	Total
Daily	116 (46.4)	128 (51.2)	244 (48.8)
Thrice a week	28 (11.2)	31 (12.4)	59 (11.8)
Twice a week	36 (14.4)	14 (5.6)	50 (10)
Weekly	35 (14)	33 (13.2)	68 (13.6)
Fortnightly	15 (6)	23 (9.2)	38 (7.6)
Never	20 (8)	21 (8.4)	41 (8.2)

Figures in parenthesis indicate percentage

breakfast for them. Likewise, Affeuito (2005) reported that the adolescent girls used to skip their meals because of lack of appetite, dieting, inconvenience of time and most of them were having working parents who had to go early in the morning for their respective jobs, thus they usually skipped their meals especially breakfast. A study conducted by Hallstrom *et al.* (2011) revealed that adolescents whose parents gave encouragement to eat healthy and to consume breakfast were more regular consumers of breakfast than those whose parents showed no concern. The results of our study were in line with the study by Chauhan and Kaur (2014) which reported that most of the adolescents perceive themselves to be overweight as compared to their actual weight status

Table 3 : Mean breakfast food frequency score of adolescent girls **(n = 500)**

Food items	Rural (n = 250)	Urban (n = 250)	Total	Z value
Cereal products				
Rusk	2.22 ± 1.71	2.43 ± 2.00	2.33 ± 1.85	1.24 ^{NS}
Biscuits	3.10 ± 1.98	2.76 ± 2.03	2.93 ± 2.00	1.89 ^{NS}
Bread + Butter	1.22 ± 1.60	1.28 ± 1.69	1.25 ± 1.64	0.40 ^{NS}
Bread + Jam	0.67 ± 1.20	0.60 ± 1.06	0.63 ± 1.13	0.66 ^{NS}
Vegetable sandwich	0.61 ± 1.14	0.98 ± 1.46	0.79 ± 1.3	3.14*
Chapatti with vegetable	3.44 ± 2.08	3.00 ± 2.34	3.22 ± 2.21	2.19*
Stuffed Parantha	2.92 ± 1.81	2.88 ± 1.89	2.9 ± 1.85	0.29 ^{NS}
Missa Parantha	2.07 ± 1.74	2.00 ± 1.80	2.03 ± 1.77	0.46 ^{NS}
Corn flakes	0.41 ± 1.07	0.43 ± 0.90	0.42 ± 0.98	0.20 ^{NS}
Rice flakes	0.48 ± 0.97	0.63 ± 0.89	0.55 ± 0.93	1.90 ^{NS}
Oats	0.23 ± 0.55	0.48 ± 0.77	0.35 ± 0.66	4.10*
Vermicelli	0.75 ± 1.12	0.66 ± 1.08	0.7 ± 1.10	0.96 ^{NS}
Milk products				
Milk	1.27 ± 1.59	1.31 ± 1.98	1.29 ± 1.78	0.24 ^{NS}
Lassi	1.29 ± 1.45	1.49 ± 1.92	1.39 ± 1.68	1.28 ^{NS}
Tea	4.59 ± 1.89	4.57 ± 1.95	4.57 ± 1.92	0.11 ^{NS}
Curd	1.07 ± 1.32	1.01 ± 1.48	1.03 ± 1.4	0.48 ^{NS}
Shakes	0.59 ± 1.13	0.39 ± 0.88	0.48 ± 1.00	2.18*
Fruits				
Whole fruit	1.63 ± 1.48	1.18 ± 1.24	1.4 ± 1.36	3.71*
Fruit juice	1.18 ± 1.24	1.00 ± 1.45	0.99 ± 1.37	0.03 ^{NS}
Egg				
Boiled egg	0.18 ± 0.59	0.18 ± 0.66	0.18 ± 0.62	0.08 ^{NS}
Omelette	0.16 ± 0.43	0.13 ± 0.40	0.14 ± 0.41	0.77 ^{NS}
Egg roll	0.14 ± 0.42	0.06 ± 0.25	0.10 ± 0.33	2.64*
Egg bhurji	0.13 ± 0.34	0.02 ± 0.15	0.07 ± 0.24	4.59*

Breakfast Food Frequency Score: Daily 6, Thrice a week 5, Twice a week 4, Weekly 3, Fortnightly 2, Rarely 1, Never 0
Values are Mean ± SD * indicates significance of value at P=0.05 level of significance NS=Non-significant

Table 4 : Reasons for skipping of breakfast by adolescent girls **(n = 256)**

Factors	Rural breakfast skippers (n = 134)	Urban breakfast skippers (n = 122)	Total breakfast skippers
Lack of time	46 (34.3)	26 (21.3)	72 (28.12)
Family eating pattern	20 (15)	25 (20.59)	45 (17.57)
Lack of appetite	48 (35.8)	47 (38.52)	95 (37.11)
Working parents	10 (7.46)	13 (10.6)	23 (8.98)
Stress	2 (1.49)	1 (0.82)	3 (1.19)
Dieting	8 (5.95)	10 (8.17)	18 (7.03)

Figures in parenthesis indicate percentage

Table 5 : Classification of adolescent girls according to body mass index **(n = 500)**

Classification	BMI (kg/m²)	Rural (n = 250)	Urban (n = 250)	Total
Underweight	<18.5	151 (60.4)	137 (54.8)	288 (57.6)
Severe thinness	<16.00	47 (18.8)	57 (22.8)	104 (20.8)
Moderate thinness	16.00-16.99	52 (20.8)	44 (17.6)	96 (19.2)
Mild thinness	17.00-18.49	52 (20.8)	36 (14.4)	88 (17.6)
Normal	18.50-24.99	81 (32.4)	82 (32.8)	163 (32.6)
Overweight	≥25.00	18 (7.2)	31 (12.4)	49 (9.8)
Pre-obese	25.00-29.99	12 (4.8)	23 (9.2)	35 (7)
Obese-I	≥30.00	6 (2.4)	8 (3.2)	14 (2.8)

Figures in parenthesis indicate percentage

and were on dieting.

The data pertaining to the anthropometric profile of the subjects was compared with ICMR (2010) standards for weight and height and reported that mean height of the adolescent girls was 152.5 ± 0.36 cm, meeting 96 per cent of the ICMR standard. The mean weight of adolescent girls (44.28 ± 23.67kg) was found to be 80 per cent of ICMR standard showing mildly underweight. The distribution of adolescent girls in terms of body mass index (Table 5 and Fig. 1) revealed that more than half of the subjects were underweight (57%) followed by 32 per cent were having normal BMI and rest 10 per cent were overweight. The percentage of over-weight adolescent girls was found to be higher in urban (12%) as compared to rural (7%) area. The results were in line with the study conducted by Chitra and Reddy (2006) which reported that the inadequate energy intake was reûected in a high incidence of malnutrition in both boys and girls where 40.3 per cent of the boys and 32.1 per cent of the girls studied were found to be underweight.

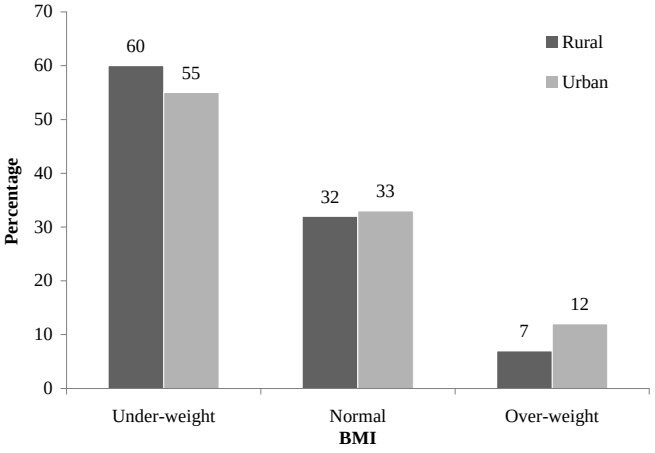

Fig. 1 : Classification of adolescent girls according to Body Mass Index

Conclusion :

The present study revealed that the prevalence of breakfast consumption on daily basis was higher among urban adolescent girls and the consumption decreased with increase in age. The lack of appetite, time and family meal pattern were the main factors affecting their breakfast consumption. Majority of adolescent girls were found to be underweight. Hence, there is a need of concerted efforts to create awareness regarding breakfast consumption among rural and urban masses are needed to achieve better nutritional status and excellent physical and academic performance through various IEC technologies.

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