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Impact Of Eating Disorder On Nutritional Status And Dietary Pattern- A Cross-Sectional Study On Adolescent Girls Of North 24 Parganas District Of West Bengal

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Abstract

Introduction: Adolescent girls are very much concern about body image, follow disordered eating habits. In 21st century one of the public health problems is eating disorder (ED), characterized by obsession with body image, food habit. Food restriction, selective eating, meal skipping (MS), excessive exercise, laxative misuse are some common behaviors of adolescent girls even of developing countries to make perfect physical posture. Objective of the study is to find out prevalence of ED and MS among adolescent girls of North 24 Parganas district and to determine theirassociation and significance on Body mass index (BMI).
Method: 385 healthy adolescent girls were selected randomly from different schools and colleges of the district according to convenience. ED was detected using Eating Disorder Examination Questionnaire (EDE-Q). MS habit, frequency in a week and timing were asked individually. Statistical tests were performed in SPSS (IBM, version 16) for analysis of data.
Result: 11.95% and 15.84% participants respectively had ED and MS tendency. Statistically significant difference in BMI was found between ED and control ($p<0.01$) and MS and non-MS ($p<0.05$) groups. There was significant association ($p<0.01$) between ED & MS. Weight concern had significant positive correlation with BMI ($p<0.01$).
Conclusion: BMI was higher among ED and MS participants than others. Excessive weight concern and inappropriate practices to lose weight adversely affect weight and food habit and make psychologically distressed. Meal skipping may cause nutritional deficiencies during the crucial growing period of adolescence age.

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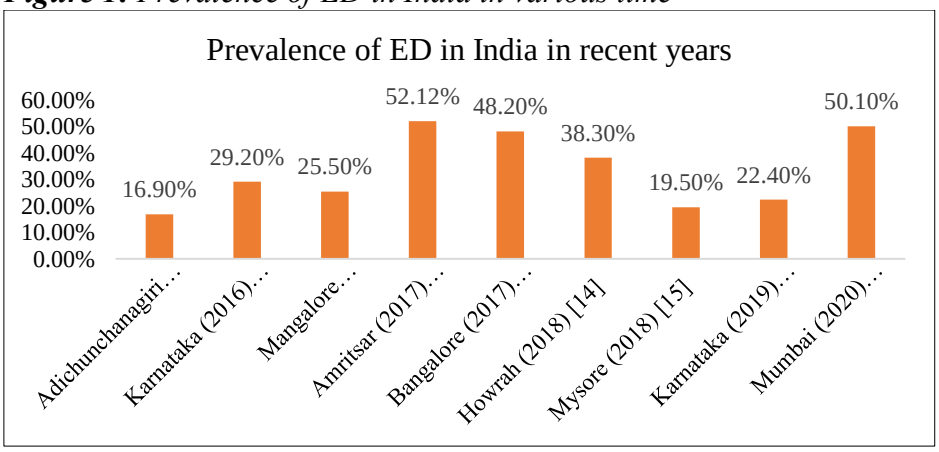
Keywords: Adolescent, Body image, Body mass index, Eating disorder, Meal skipping.

INTRODUCTION –

One of the public health problems in 21st century is Eating Disorder (ED). Excessive body image concern of adolescent girls initiates the onset of ED that reduces survival age (Killen et al., 1994). As per tenth version of International Classification of Disorders (ICD-10) ED's are defined as- "*a series of behavioural disorders which are associated with physiological and physical alterations'* (Alonso et al., 2005). Widespread use of social media during adolescence age and immature mind of adolescents easily provokes them towards attractive slimness beauty messages that brings about body image dissatisfaction (BID). BID is the negative self-directional feeling, approach and belief of one's physical aspects of body related to weight, shape, size, fitness, trimness. BID arises during adolescent age mainly among girls (McLean & Paxton, 2019; Shah et al., 2012; Babu & Aroor, 2017). Some risk factors identified for development of ED are- high body mass index (BMI),thin body preoccupation, social pressure, substance used, parental and peer pressure, psychological issue,negative life events, school performance, support/ sharing life events etc. (McKnight, 2003; Ganguly et al.,2018). In order to control weight or get desired perfect body shape individuals go through untrained orunscientific lifestyle modification (diet, purging, misuse of laxatives and excessive physical exercise) whichhas serious complications in later life. Among dieting, restrictive eating and meal skipping are the commonone (Izydorczyk & Warchulska, 2018; Cruz-Saez et al., 2013).

Some recent prevalence of ED in India in different time frame are as follows-

Figure 1: *Prevalence of ED in India in various time*



OBJECTIVES –

In West Bengal (WB) there is only one study in Howrah district regarding ED on adolescents. Thus, the current study was undertaken to determine the prevalence of ED among adolescent girls of North 24 Parganas districtof WB and to determine the BMI and meal skipping habits of individuals. Relationship between weight concern and BMI was also observed.

METHODOLOGY –

- *Ethical consideration* - The ethical clearance was obtained from West Bengal State University Institutional Ethics Committee (IEC) for Research on Human Subjects (approval no. WBSU/IEC/30/05). Before study written consent from head of institutions; from students and guardians (in case of under 18 years of age) were obtained and only willing participants were allowed to take part in the survey.

- *Sample size & sample selection* - 385 adolescent girls of 13-19 years were randomly selected from different schools and colleges of North 24 Parganas district of WB according to researcher's convenience. Samplesize was obtained from Cochran (1975) formula (Singh & Masuku 2014). The inclusion criteria like- girls,age group, unmarried, free from other diseases, live in the district from birth were strictly followed duringsample selection.

- *Eating behavior assessment* - Eating pattern was determined using Eating Disorder Examination Questionnaire (EDE-Q 6.0). It is a well established and internationally accepted self-reported questionnaire for comprehensive analysis of eating pattern and behaviors in four subscales. It has also been used in Indian

context. Individuals scoring >=5 was determined as ED. Participants who scored below cut off value was regarded as 'control' (Hilbert et al., 2012; Thangaraju et al., 2020).

- *Dietary pattern assessment* - 24 hours dietary recall of 7 days was taken in oral questionnaire form to understand their food habit (Sinha & Singh, 2016). Tendency, time and frequency of meal skipping were asked individually for better understanding of dietary pattern. Individual skipping any meal 'regularly' or 'sometimes' was determined as meal skipper (MS) and others were designated as non-MS.

- *Weight concern* - One of the subscales of EDE-Q 6.0 is weight concern. The total score of different questions in weight concern scale was taken for analysis.

- *Anthropometric assessment* - Standing height was taken using stadiometer. Weight was taken using weighing machine (Das, 2016). From there, BMI was calculated. All the data were collected with trained staff in a private classroom to maintain confidentiality of data.

- *Data analysis* - Descriptive statistics like bar diagram, mean, standard deviation was done. Independent t test was used to find difference in mean score of BMI among various groups. Chi square significance test was performed for analysis the association between ED and MS. At last, Pearson's correlation coefficient was calculated to determine the relationship between BMI and weight concern. Statistical analysis was done in a software named Statistical Package for Social Sciences (IBM SPSS, version 16.0).

RESULT & DISCUSSION -

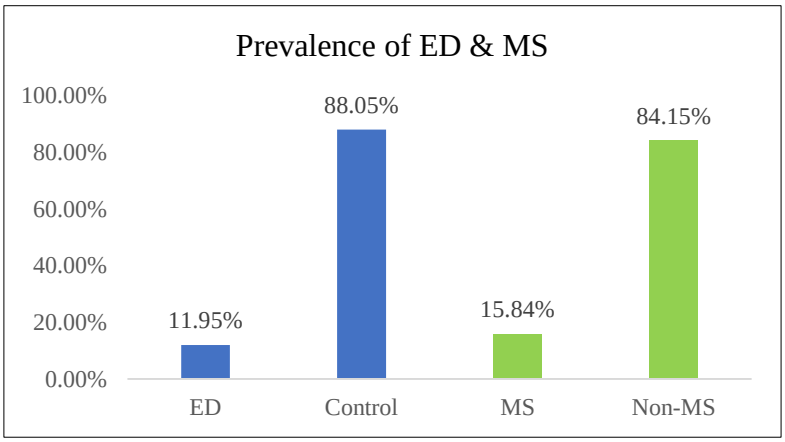


Figure 2: *Prevalence of Eating disorder and meal skipping in the population*

Among total population, 11.95% and 15.84% were ED participants and MS respectively. The prevalence of ED is somewhat consistent with the study by Thangaraju et al. where 13.5% ED cases were determined by using EDE-Q 6.0 (Thangaraju, 2020). But another study showed 38.6% ED cases among adolescent school girls in Howrah district of WB (Ganguly et al., 2018). But a low prevalence of 7.8% was found in Spain among 12-18 years school girls (Alonso et al., 2005). A high prevalence of meal skipping among university students of Turkey was reported by Aykut et al. (64.7%) which is almost 4 times higher than our study (Aykut & Bilici, 2022). The prevalence rate may vary according to place, cultural habits and instrument used for assessment.

Table 1: *Difference in BMI among various groups*:

Groups		n	Mean ± SD	*p* value
ED	Present	46	24.67 ± 3.92	0.001**
	Absent	339	22.20 ± 4.62	
MS	Yes	61	23.82 ± 4.19	0.014*
	No	320	22.25 ± 4.65	

[independent t test; ** $p<0.01$, *$p<0.05$; significance was two tailed].

Difference in BMI status among ED and control group and MS and non-MS groups were observed by independent t test. Table 1 shows, **statistically significant difference in BMI status for both ED** (p<0.01) and **MS** (p<0.05) categories. Eventually, BMI were significantly higher among ED and MS groups when compared to control and non-MS groups but both are within the normal BMI range.

High BMI among ED participants were also found in other studies (Cruz-Saez, 2013). Sociocultural attributes and thin body internalization concepts seem to accelerate negative body image perception. In order to achieve perfect figure, weight control behaviors and dietary restrictions are commonly adopted, followed by disturbed eating pattern; identified as ED. Further, meal skipping increases cravings towards next meal, may lead to eat more and subsequently weight gain (Shah et al., 2012; McCory, 2014).

Table 2: Association of ED with meal skipping:

		ED		χ^2	*p value*
		Present	Absent		
Meal skipping	Regular	18	21	72.31	0.000**
	Sometimes	9	13		
	Never	19	305		

**p<0.01, significance was done at 99% CI.

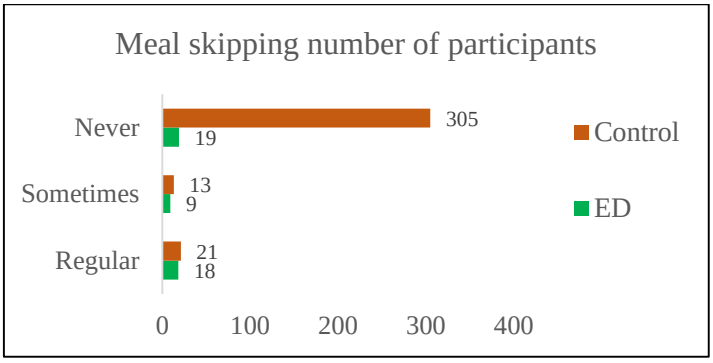


Figure 3: *Association of ED with meal skipping*

ED has statistically significant (p<0.01) association with meal skipping. Negative body image perception may lead to purging or restrictive eating and meal skipping as part of weight control and may initiate disordered eating attitudes.

Significant association between these two variables was also observed in previous studies. The drive for thinness, negative body image concern among adolescent girls put them to follow weight control behaviors amongwhich dieting is the most common one. Dieting includes both restrictive and selective eating and mealskipping. Any kind of dieting has been shown to increase BMI and risk of ED in various studies. Worldwide,meal skipping prevalence varies 5-83% according to lifestyle change, cultural practices and self-esteem (McLean & Paxton, 2019; Aykut & Bilici, 2022)

Table 3: *Relation between BMI & weight concern:*

	r value	*p* value
Weight concern scale & BMI	0.367	0.000**

**Correlation is significant at the 0.01 level (2-tailed).

A moderate **significant positive correlation exists between weight concern and BMI (p<0.01)**. Over concern about body weight actually contributes more weight gain and consecutively high BMI. Excessive weight concern pushes individuals to follow weight control behaviors which may in turn leads to weight gain if not followed scientifically, thus, weight concern and BMI has been found to be positively correlated.

It is known that, thin ideology with perfect curvature shape is normal desire of today's women. Failure to achieve the perfection leads to body shaming, low self-esteem etc. Impact of social media of slim beauty concept gradually leads to overestimation of body image. Without proper dietary and lifestyle knowledge,

individual's obsession with body weight in turn increases body weight by various ways. Increased weight or BMI in turn raises the concern over weight (Aykut & Bilici, 2022; McCory, 2014).

CONCLUSION –

High BMI was observed among ED and MS groups than control and non-MS groups. Continuous presence of excessive weight concern and inappropriate practices of weight loss adversely affect body weight and dietary intake and make psychologically distressed. Negative body image concern provokes towards dieting that increases meal skipping tendency that in turn rises the risk of ED. Skipping one or more meal definitely lowers dietary quality. Meal skipping is known to increase hunger at next meal which may be the reason of reduced satiety and weight gain. Thus, Meal skipping may be considered as risk factor of ED and both the determinants result in subsequent weight gain. Meal skipping may cause nutritional deficiencies during the crucial growing period of adolescence age. Any deprivation at this stage will have adverse impact in future life. Thus, unnecessary use of social media should be avoided. Physical exercise should be considered as a part of normal lifestyle to stay healthy and active. In case of any psychological issue, parents should seek help of health professionals. Before dieting, individuals should consult with their parents and health professional to know the correct nutritional guidelines for proper growth and development according to their age and physiological status. In future, the reason of meal skipping and the type and duration spent on social media should be studied on the same population, to derive the proper cause of ED among adolescent girls.

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