

Review article

A Comprehensive Review On Prevalence And Risk Factors Of Eating Disorders And Unhealthy Eating Behaviors In Adolescents From Some States Of India Between 2010-2022

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ABSTRACT

Purpose: Eating disorder (ED) is a psychological and lifestyle disorder characterized by obsessions with food, body weight, size and shape. Eating disorder involves unhealthy or disturbed behaviors and attitudes towards regular meal pattern. Adolescent girls are more prone to develop eating disorder than males and it negatively affects their physical and socio-economic health. Industrialization has now cultivated this western concept on Indian adolescent girls. Dieting practices sometimes lead to hospitalization and severe nutritional

deficiencies. The objective of the review is to see the occurrence and prevalence of ED and identify the risk factors in various Indian states in last twelve years.

Methods: All the papers from 2000-2022 were reviewed from Google scholar and PubMed. Indian prevalence from 2010-2022 was collected from these databases and references of other studies. 12 Indian studies were included after literature study.

Results: Fair percentage of ED was found to be prevalent in India. In India, fasting is normally accepted from religious belief and frequently festivals are celebrated with sweets and high calorie foods. So actual cause of disordered eating pattern including both anorexia and bulimia nervosa is very challenging to determine.

Conclusion: The identification of ED cases is difficult even at advanced stage and sometimes become very fatal. Basic health and nutritional knowledge from early age, regular health check-up, good family relationship are important factors to prevent ED. An overall diagnostic tool and skilled health care personnel are required to detect the problem.

Keywords: Adolescent, Anorexia Nervosa, Bulimia Nervosa, Depression, Eating Disorder, Obesity.

INTRODUCTION

Body weight dissatisfaction and obsession with food is termed as eating disorder.^[1,2] It is more common among adolescent girls, negatively affects their physical, psychological and socio-economic health.^[1,3] Sedentary lifestyle, academic stress, family pressure, westernization, teasing with body image lead to depression and undesirable eating attitudes.^[4] Various changes at this time adversely affects their food intake and severe urge to thinness and body image concern force them to do dieting, ultimately lead to eating disorder.^[5] From general weakness to GI disturbances, malnutrition, mouth and skin problems^[6], bone and micronutrient deficiencies^[7] are seen.

METHODOLOGY

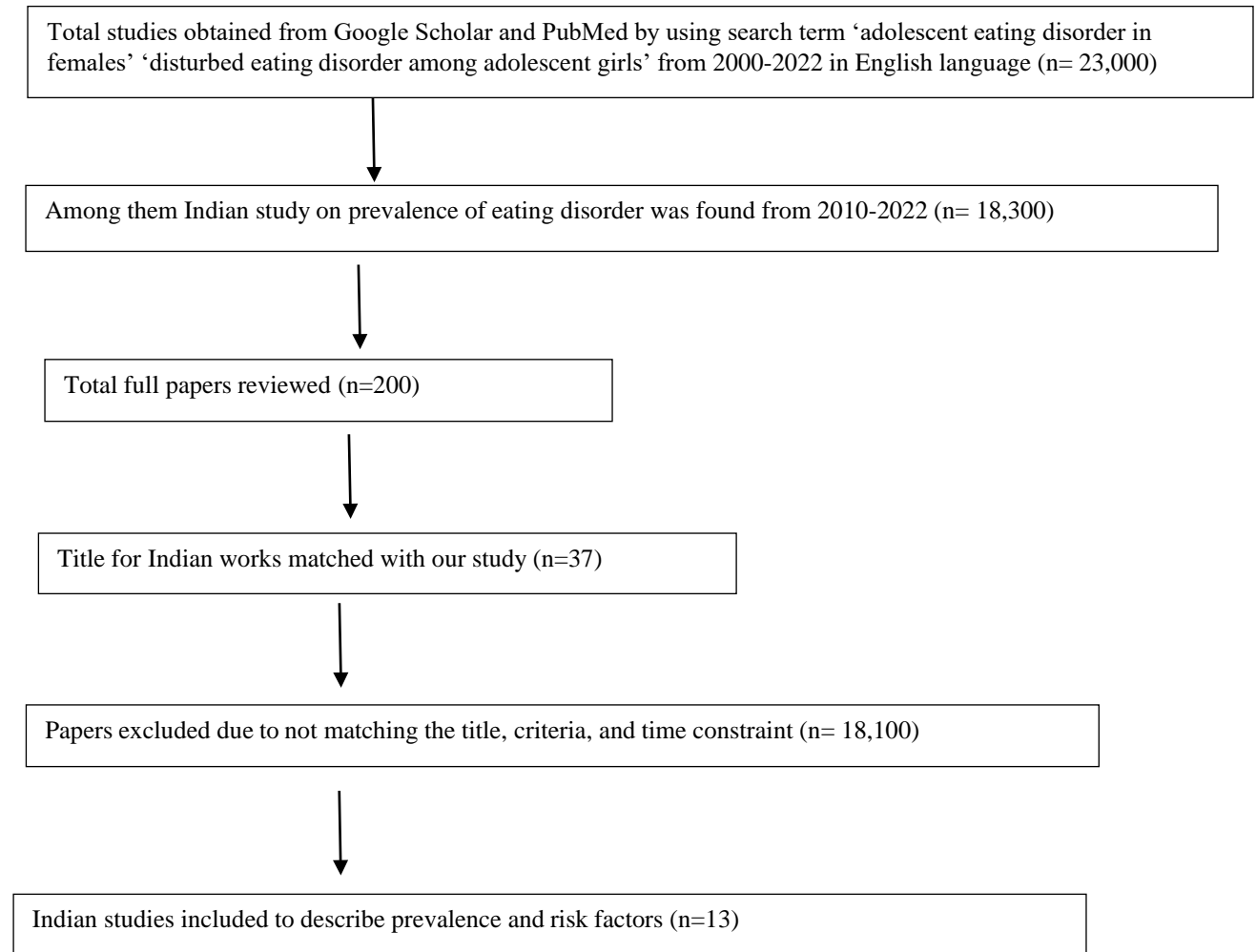


Figure 1: Flowchart of detail method

REVIEW OF LITERATURE

PREVALENCE AND RISK FACTORS OF DISORDER/ DISTURBED EATING ATTITUDE AND BEHAVIOUR-

In 2014, **Upadhyay and Mishra** found 26.67% adolescent girls of 13-17 years in a school of Allahabad had body weight dissatisfaction. They had low BMI due to dieting, and ongoing eating disorder. Girls obsessed with perfect body shape and eat on mood were at risk.^[8] Biasness in prevalence rate may present as scoring was done by participants itself.

16.9% medical students of Adichunchanagiri of mean age group 21 years had eating disorder found by **Ramaiah** in **2015**. The students lived in hostel but 17.4% and 6.4% respectively were found overweight and obese ^[9] which indicated an increasing trend of overweight among Indian college students. Monotonous foods in hostel brought food ignorance in regular life and lead to ED. The gender of participants was not mentioned. The reason of high BMI among medical students (as mentioned in the study) is not cleared.

Shashank et al. in **2016**, examined 134 undergraduate students in a tertiary rural medical college of Karnataka for eating disorder by EAT-26 and SCOFF questionnaires and found 29.2% and 17.2% respectively.^[10] Overweight was still found at a high percentage among study population which was consistent with previous study of Ramaiah. But it cannot define the situation of other medical students of Karnataka.

In **2017 Gupta et al.** found that dieting and acculturation issues were high among medical students of Chandigarh particularly belonging from nuclear family.^[11] But in this study, the age group, effect of joint family and other religion on eating attitudes were not clear.

In **2017, 25.5%** of girls students of Mangalore were detected with ED by **Babu and Aroor**. Only students from four schools and three colleges were included. The detected students were reported with high BMI, psychological, behavioral and socio-economic factors. Dieting means inappropriate food choice, is a significant part of ED and increases the risk of development by 6%. ^[5] The study included adolescent students of 14-19 years which contradicted the actual adolescent age suggested by WHO that is 10-19 years. Secondly, the study cannot describe about all adolescent girls of Mangalore as it had limited coverage. Regular health check-up and monitoring in institution; and inclusion of basic health and nutritional knowledge in curriculum are necessary steps concluded by the authors; otherwise, such cases are difficult to identify.

But the study of **Kaur et al.** in 2017 at Khalsa college of Amritsar revealed significantly high percentage (52.12%) ED by EAT-26 questionnaire. Such high prevalence needs an immediate approach suggested by the authors. ^[12] The authors found positive association between bulimia, dieting and oral control but oral control behavior was not clear. They

calculated BMI from value of height and weight as per participants' response which limited the originality of the study and also restricted the interpretation of anthropometric data.

On the other hand, **19.5%** ED was found among college students of Mysore in **2018** by **Nivedita et. al** with the help of EAT-26 and binge eating questionnaire. They measured height, weight, BMI, fat percentage, waist circumference, waist-hip ratio, basal metabolic rate and haemoglobin level. The study had surprising result. ED population had normal haemoglobin level while anemia was significantly present in the population. ^[13] The causes of anemia was not studied as it was not objective of the study. They also reported delayed menstruation of ED participants as consistent eating disorder reduces body weight whereas binge eating accumulates fat, provides required nutrition and causes early menstruation. The prevalence rate of the study is nearly similar to the previous study done by Upadhyay and Mishra in 2014 in Allahabad. But the age range in previous study was slightly different. Another study in the same year in **Howrah** district of West Bengal showed almost double cases of ED (**38.3%**) by **Ganguly et. al**. Surprisingly, there was no effect of media on development of ED but family and peer pressure was more on body weight control. ^[14] Though the questionnaires of these two studies were different which greatly affect prevalence rate. The study opened a new way of thinking about Bengali culture on body weight pattern.

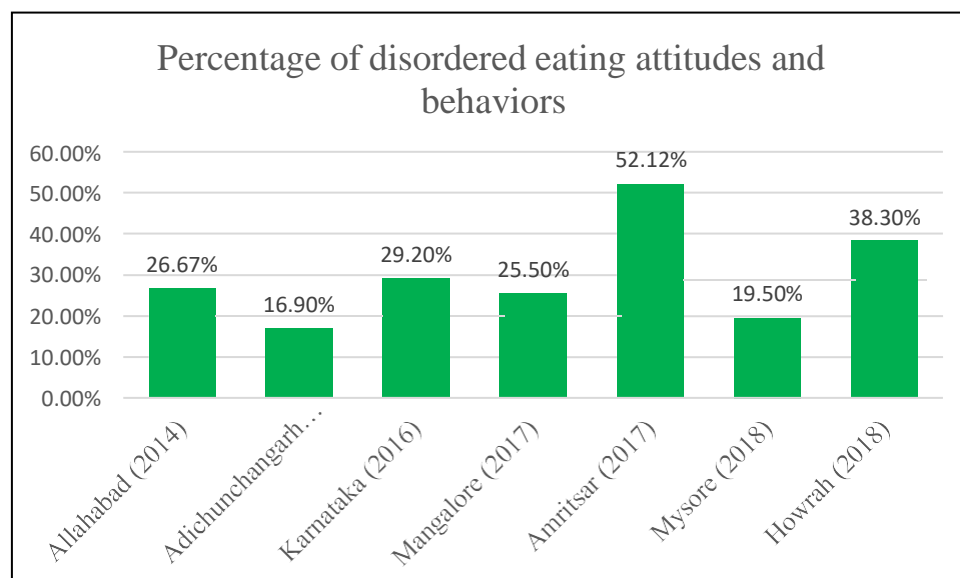


Figure 2: This diagram represents percentage of disordered/ disturbed eating attitudes in seven places of India from 2014-2018

PREVALENCE AND RISK FACTORS OF BINGE EATING DISORDER IN SOME INDIAN STATES-

Vijayalakshmi and Thimmaiah in **2017** observed 48.2% binge eating case among medical and nursing female students of **Bangalore**. The study considered male students of same college also but the prevalence among male was slightly lower. But male students were involved in exercise and eating disorder treatment whereas female students had a tendency to hide their eating behavior problem. Rate of depression was also comparatively higher in males. ^[15] This makes delay in detection and probably treatment procedure is somehow hampered. As BMI was calculated on self-reported data so some bias information may be present which will underscore the study.

22.4% binge eating disorder was found to be present among medical and engineering students of 500 sample of mean age 19 years by **Shenoy and Praharaj in 2019** in colleges of **Karnataka**. Participants with BED actually had borderline personality disorder which may affect their food intake. ^[16] Previous study in Karnataka revealed almost 29.2% of ED among medical female students with high number of overweight among entire study population. This probably suggests a trend of overweight/ obesity among medical students of Karnataka. Study of diet pattern of students of Karnataka and possible causes of overweight should be identified.

The prevalence of moderate binge eating disorder (BED) and severe BED was found around 50.1% and 36.8% respectively among adolescents of class 8-12 in Dadar, Mumbai in **2020** by **Dikshit et al**. Average age of students was 12-18 years and binge eating disorder was assessed by binge eating scale and eating behaviour pattern questionnaire. The case was high among girls with irregular menstruation and psychological problems. They were influenced by social media and preferred outside foods mainly fried foods. ^[17] The actual prevalence among girls was not clearly mentioned. Consumption of frequent fried foods or so called junk foods provides lots of calorie at a time leading to crave and binge eating. This also reduces episodes of regular family meals.

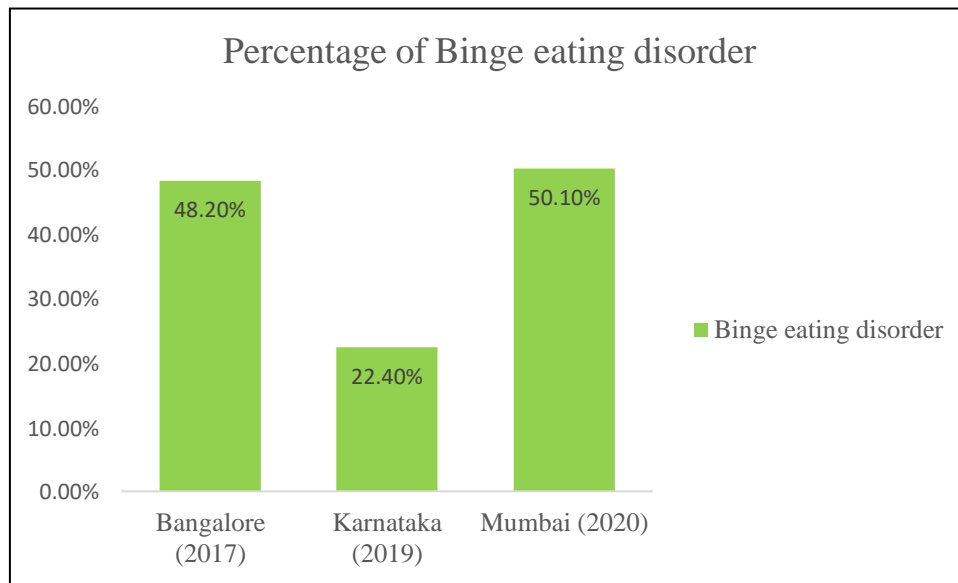


Figure 3: This diagram represents percentage of binge eating disorder in three places of India from 2017-2020

PREVALENCE AND RISK FACTORS OF DISSATISFIED BODY WEIGHT-

Body weight dissatisfaction refers to unhappiness with current body status and a strong urge to change it to get a desirable body image.^[18] So, it is associated with individual's perception and behavior with their body image that ultimately leads to unhealthy eating behavior or 'dieting'^[19] with improper food consumption both in terms of quantity and quality. It restricts certain important food amount in daily menu. Body weight dissatisfaction has a positive result on development of ED.

The dissatisfaction comes from Sedentary lifestyle, academic stress, negative environment in school or home, poor relationship with parents and results in depression, disappointment with body size and ultimately unhealthy eating behavior or ED.^[4] India also has some cases of body weight dissatisfaction.

36.22% body weight dissatisfaction among Sikkimese females of 15-19 years especially belonging from high socio-economic families were found by **Mishra and Mukhopadhyay in 2010**. Among them, 20.10% had strong desire for dieting so they skipped meal once in a week or intentionally avoided certain foods, and 5.2% followed weight reducing diet. But most of them had normal BMI. Food habits and dietary behaviour were assessed by food frequency questionnaire.^[20] The survey was conducted mostly in urban

blocks of Gangtok, a popular tourist spot. So, their lifestyle, food habit and dietary pattern are greatly influenced by visitors and differ from other Sikkimese population. The urge for dieting is one of the indicator of such assessment. The dieting pattern may change according with food habit. Some food items were not included in the questionnaire due to rare consumption but their frequency, amount and impact on regular meal consumption is unknown.

In 2011, another study was carried out by **Dixit et al.** in some urban, slum and rural blocks of Lucknow on 13-15 years girls. 26.6% body weight dissatisfaction was found among them especially from high socio-economic families of urban areas. Urban girls are pampered and picky eaters and got option for body image concern. Slum, being a part of urban area, mostly try to follow urban lifestyle; so sometimes develops problems same as urban citizens. But rural girls were generally poor, faced gender discrimination at home and had less access to food and basic needs and thus they did not think about body shaping. 20.5% girls wanted to become thin when they were already very thin.^[21] As body image dissatisfaction leads to adopt faulty eating and behavior techniques to lose weight and gradually lead to eating disorder. So, it is an early indicator of eating disorder. Undetected eating disorder cases may be present among body weight dissatisfier, so, they should be evaluated further to diagnose eating disorder.

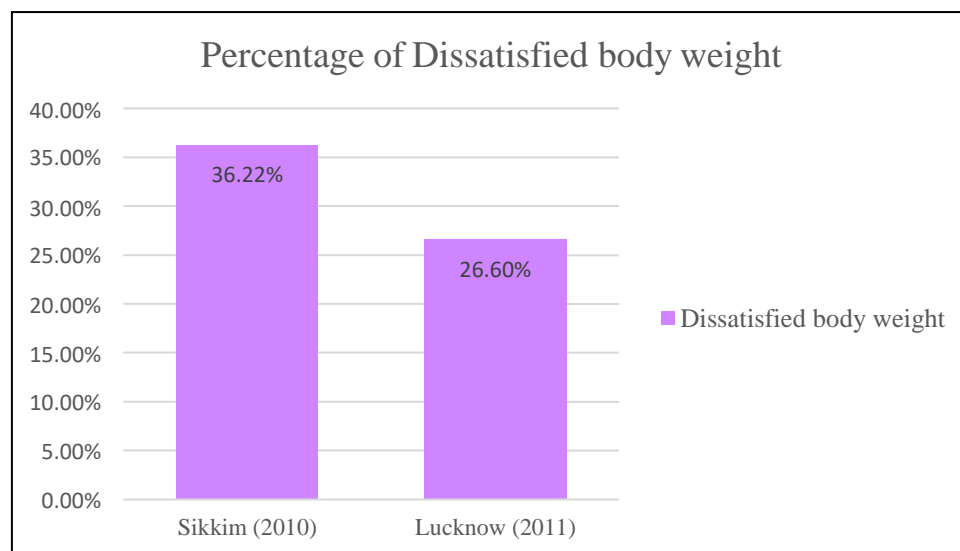


Figure 4: This diagram represents percentage of body weight dissatisfaction in Sikkim and Lucknow from 2010-2011

Table 1: Summary of the year-wise prevalence of different forms of eating attitudes by different authors in last 10 years' time span and methods used -

Name of authors	Year	Place	Methods used	Prevalence (%)	Types of eating attitude
Mishra and Mukhopadhyay [20]	2010	Sikkim	sociodemographic factor questionnaire and food frequency questionnaire	36.22	Dissatisfied body weight
Dixit et al. [21]	2011	Lucknow	Body image questions	26.60	Dissatisfied body weight
Upadhyay and Mishra [8]	2014	Allahabad	EAT-26	26.67	Disordered or disturbed eating behavior
Ramaiah [9]	2015	Adichunchanagiri	EAT-26 and body shape questionnaires	16.90 & 11%	Eating disorder & dissatisfied with body shape
Shashank et al. [10]	2016	Karnataka	EAT-26 & SCOFF questionnaires respectively	29.2% & 17.2% respectively	Eating disorder
Babu and Aroor [5]	2017	Mangalore	EAT-26	25.5%	Eating disorder
Kaur [12]	2017	Amritsar	EAT-26 questionnaire	52.12	Eating disorder

Vijayalakshmi and Thimmaiah ^[15]	2017	Bangalore	SCOFF questionnaire	48.20	Binge eating disorder
Ganguly et al. ^[14]	2018	Howrah	eating distressed syndrome questionnaire	38.30	Disordered or disturbed eating behavior
Nivedita et al. ^[13]	2018	Mysore	EAT-26 and Binge Eating Scale (BES) questionnaire	19.50	Eating disorder
Shenoy and Praharaj ^[16]	2019	Karnataka	Mood Disorder Questionnaire, Binge-Eating Disorder Screener, bipolar spectrum disorder and binge-eating disorder (BED)	22.40	Binge eating disorder
Dikshit et al. ^[17]	2020	Mumbai	binge eating scale and eating behaviour pattern questionnaire.	50.10	Binge eating disorder

DISCUSSION

In India the overall prevalence of ED is higher among girls than boys due to excessive concern on body image and shape among girls and it mostly starts at the age of 15 years or nearly pubertal age.^[22] Also, the identification of bulimia or binge eating episodes are quite difficult in Indian context as any Indian festivals or occasions are celebrated with sweet dishes. So, people consume it frequently and sometimes become loss of control over sweets.^[23]

The most challenging task is to identify the adolescents with ED in healthcare setup even at an advance stage. Parents can be included in the diagnosis session to identify the

symptoms as most of the children have the tendency to hide their symptoms or problems.^[8, 24,25]

Every study has some methodological limitations which reflect the prevalence and incidence of eating disorder. It was found that among all types of eating disorder anorexia and bulimia nervosa occur during onset of adolescence while binge eating appears at the middle of adolescent age.^[26] Cultural variation, value of society, psychological and intergenerational approaches, adoption of high calorie processed foods ^[27] reflect ED occurrence. Longitudinal studies and universal instruments to suit in all cultures is required in India to see the severity where wide variety of cultural differences exists.^[9,10, 28]

CONCLUSION

The severity of eating disorder is rising in developing countries like India. The highest percentage of Eating disorder (52.12%) was found in Amritsar in 2017 and binge eating disorder (50.10%) in Mumbai in 2020. The score of response differs according to various questionnaires and various study population so the exact number of cases within a particular geographical area is difficult to determine. The response may also vary with time. India has wide range of cultural and ethnical variation so a proper diagnostic tool is required to detect eating attitude related problems. People need to be made aware so that they can share their problems to the therapists or interviewer and necessary treatment may be given to them on time. Individual cases of anorexia and bulimia nervosa was not reviewed in our study that could be a limitation of this study. During eating disorder or eating behavior analysis dieting or irregular food habits among adolescents was found a common factor but in India food consumption is often limited by socio-economic condition and ritualistic fasting which may mask the real cause of anorexia and disturbed eating attitude. This also makes the person nutritionally deficient. The food habits greatly vary according to various Indian states so only the nature and pattern of food habits cannot be taken as ED diagnostic tool. We cannot include all Indian studies due to some time constraints, so a more thorough and comprehensive review is necessary for better understanding of Indian eating attitudes scenario.

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